

\*See page 299 for index and glossary of acronyms.

# CALVIN

## College



*Catalog 2015/2016*



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*The Calvin College Catalog is published every academic year. While every effort is made to provide accurate, up-to-date information at the time of publication, Calvin College reserves the right to change, without notice, any statement in this publication concerning, but not limited to, policies, tuition, fees, curricula, course offerings, program requirements, faculty and other matters.*

*The information in this publication can be provided in an alternative format. Please call 1-800-688-0122 to request this service.*

# 2015–16 Calendar

## SEPTEMBER 2015

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
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## OCTOBER 2015

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## NOVEMBER 2015

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29	30					

## DECEMBER 2015

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## JANUARY 2016

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31						

## FEBRUARY 2016

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## MARCH 2016

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## APRIL 2016

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## MAY 2016

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## JUNE 2016

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## JULY 2016

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## AUGUST 2016

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## SEPTEMBER 2016

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## OCTOBER 2016

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## NOVEMBER 2016

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## DECEMBER 2016

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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Important Deadlines for Students	Fall Semester	Spring Semester
Last day to add classes	September 14	February 5
Last day to obtain any refund for full semester course drops/withdrawals (see financial services)	October 15	March 9
Last day to remove incompletes from the previous semester	October 15	March 15
Last day to change from credit to audit	November 6	April 8
Last day to drop full semester course	November 6	April 8

# Academic Calendar

## The Fall Semester 2015

August	25-26	Tues-Wed	New Faculty Orientation
	27	Thursday	Fall Conference for Faculty and Staff
September	2	Wednesday	Residence halls open, Orientation and registration begins
	8	Tuesday	Fall semester classes begin, 8:00 a.m.
	8	Tuesday	Convocation 9:50-10:50 a.m.
October	23	Friday	First session half-semester courses end
	26	Monday	Second session half-semester courses begin
November	3-4	Tues-Wed	Academic advising recess
	4	Wed	Registration for Interim/Spring semester begins
	4	Wed	Classes resume, 5:00 p.m.
	25	Wednesday	Thanksgiving recess begins 5:00 p.m.
	30	Monday	Classes resume 8:00 a.m.
December	12	Saturday	Reading recess
	14	Monday	Examinations begin 9:00 a.m.
	18	Friday	Examinations end and Christmas vacation begins 10:00 p.m.

## The Interim 2016

January	6	Wednesday	Interim term begins 8:30 a.m.
	26	Tuesday	Interim term ends 5:00 p.m.
	27-29	Wed – Fri	Interim break

## The Spring Semester 2016

February	1	Monday	Spring semester classes begin
	3	Wednesday	Spring Semester Convocation
March	11	Friday	Classes end / spring break begins at 6:00 p.m.
	14-18	Mon-Fri	Spring break
	21	Monday	Spring break ends/ classes resume at 8:00 a.m.
	24	Thursday	Friday class schedule in effect
	24	Thursday	First session half-semester courses end
	25, 28	Fri, Mon	Good Friday, Easter Monday – no classes
	29	Tuesday	Second session half-semester courses begin
April	20	Wednesday	Honors Convocation 7:30 p.m.
	26-27	Tues-Wed	Academic advising recess
May	13	Friday	Reading recess
	14	Saturday	Examinations begin 9:00 a.m.
	19	Thursday	Examinations end 10:00 p.m.
	19-21	Thurs-Sat	Commencement Activities
	21	Saturday	Commencement ceremony 2:00 p.m.

## Summer Sessions for 2016

### Session I

May 25–June 15	Three week session
May 25–June 22	Four week session

### Session II

June 23–July 14	Three week session
June 23–July 21	Four week session

### Session III

July 25–August 12	Three week session
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# Mission of the College

## Mission

Calvin College equips students  
to think deeply,  
to act justly,  
and to live wholeheartedly  
as Christ's agents of renewal in the world.

## Identity

Calvin College is a Christian academic community dedicated to rigorous intellectual inquiry.

Calvin students study the liberal arts and select from a broad range of majors and professional programs. The college fosters scholarship that creates new knowledge, that performs creative work, and that sustains natural and cultural resources. A Calvin education, marked by scholarly engagement with enduring questions and emerging concerns, prepares students to answer God's call to live and serve in God's world as agents of renewal.

Calvin College does all this with a robust commitment to providing equal opportunities for all faculty, staff, and students. Calvin College was founded in 1876 by the Christian Reformed Church in North America and named for 16th-century reformer John Calvin. The historic creeds and confessions of Reformed Christianity guide the college's understanding of scripture and inform its mission.

## Purpose

Our primary purpose is to engage in vigorous liberal arts education that promotes lifelong Christian service. We offer education that is shaped by Christian faith, thought, and practice. We study and address a world made good by God, distorted by sin, redeemed in Christ, and awaiting the fullness of God's reign. We aim to develop knowledge, understanding, and critical inquiry; encourage insightful and creative participation in society; and foster thoughtful, passionate, Christian commitments. Our curriculum emphasizes the natural, cultural, societal, and spiritual contexts in which we live; our teaching respects diverse levels, gifts, and styles of learning; and our learning proceeds as a shared intellectual task.

Another purpose is to produce substantial and challenging art and scholarship. We pursue intellectual efforts to explore our world's beauty, speak to its pain, uncover our own faithlessness, and proclaim the healing that God offers in Jesus Christ. We strive to embrace the best insights of Christian life and reflection; engage issues in the intellectual and public spheres; and enrich faith by the heritage of the past and the discoveries of today. Our faculty and staff are committed to keen and lively work in their chosen fields and to sharing its fruits with others.

We are also called to perform all our tasks as a caring and diverse educational community. We undertake our tasks in response to a divine calling. Together, we challenge ourselves to excellence as we acquire knowledge, cultivate aspirations, and practice lives of service. We seek to gather diverse people and gifts around a common pledge and purpose; pursue justice, compassion, and discipline; and provide a training ground for the life of Christian virtue. Our classrooms embody a community of faith and learning extending across campus and beyond.

These purposes are further articulated in the college's *Expanded Statement of Mission* and related documents.

## Government

The corporate name of the college is Calvin College. It is governed by a single board of trustees, which represents the ecclesiastical geographical districts of the Christian Reformed Church in North America.

The membership of the board comprises sixteen regional trustees, up to three alumni trustees, and up to twelve at-large trustees. The trustees are selected by the board's Trusteeship Committee from nominations made by the various denominational classes, the Alumni Association, and, in the case of at-large trustees, by the board itself. Trustee appointments are subject to ratification by the Synod of the Christian Reformed Church.

The Board of Trustees meets in October, January, and May. An executive committee functions for the board throughout the academic year.

## Compliance with Legal Requirements

Calvin College, in accordance with Title VI of the Civil Rights Act of 1964, operates in a non-discriminatory manner with regard to race, color, age, or national origin. Furthermore, as required by Title IX of the 1972 Education Amendments, Calvin College does not discriminate on the basis of gender in its educational programs, activities, or employment policies. Calvin College also provides equal opportunity for qualified handicapped persons in accordance with the requirements of Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990. Instructional and other physical facilities are readily accessible to handicapped students, and special rooms in the residence halls are designed for barrier-free living. The Office of Academic Services provides advice and support to students with disabilities. Inquiries and appeals regarding compliance with these federal requirements should be directed to the associate vice president for human resources as Civil Rights, Title IX, and Section 504 coordinator.

Clery Act - Calvin College does not discriminate on the basis of sex in its educational programs and sexual harassment and sexual violence are types of sex discrimination. Other acts can also be forms of sex-based discrimination and are also prohibited whether sexually based or not and include dating violence, domestic violence, and stalking. As a result, Calvin College issues this statement of policy to inform the community of our comprehensive plan addressing sexual misconduct, educational programs, and procedures that address sexual assault, domestic violence, dating violence, and stalking, whether the incident occurs on or off campus and when it is reported to a College official. In this context, Calvin College prohibits the offenses of domestic violence, dating violence, sexual assault and stalking and reaffirms its commitment to maintain a campus environment emphasizing the dignity and worth of all members of the college community. For a complete copy of Calvin College's policy governing sexual misconduct, visit <http://www.calvin.edu/broene/organizations/sapt/information/assault.html> or [www.calvin.edu/go/clery](http://www.calvin.edu/go/clery).

## Accreditation and Affiliation

Calvin College is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools, 230 South LaSalle St, Suite 7-500, Chicago, IL 60604-1411, phone 800.621.7440. It is also accredited by the American Chemical Society, National Association of Schools of Music, and the Teacher Education Accreditation Council. The Calvin nursing program is accredited by the Commission on Collegiate Nursing Education and is approved by the Michigan Board of Nursing; the engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>; the bachelor in computer science degree program is accredited by the Computing Accreditation Commission of ABET, the social work program is accredited by the Council on Social Work Education, and the master's program in speech-language pathology is a candidate for accreditation by the Council on Academic Accreditation in Audiology and Speech-Language



Pathology (CAA) of the American Speech-Language-Hearing Association (candidacy is a “pre-accreditation” status with the CAA, awarded to developing or emerging programs for a maximum period of five years). The accreditation documents from these agencies are on file in the Office of the Provost and are available for review in that office upon request.

The College also has institutional membership in a number of professional associations and organizations. It maintains membership in the Association of Independent Colleges and Universities of Michigan, the National Association of Independent Colleges and Universities, the Council of Independent Colleges, the Council for Christian Colleges and Universities, the Council on Undergraduate Research, the American Association of Colleges for Teacher Education, the International Association for the Promotion of Christian Higher Education, and the Michigan Academy of Science, Arts, and Letters.

## **Academic Calendar**

The academic calendar consists of two semesters, each approximately four months in length, plus a one-month interim term in January. Students normally take 12–17 semester hours during each of the two semesters and 3–4 semester hours during the interim.

The summer semester offers 3 and 4 week courses with daytime and evening courses and weeklong graduate workshops. Students can normally complete up to three regular courses during the summer session.



# Admission

## Procedures for Admission

In selecting students for admission, Calvin looks for evidence of Christian commitment and for the capacity and desire to learn. Students who are interested in the Christian perspective and curriculum of Calvin and who show an interest in its aims are eligible for consideration. Although the prospect of academic success is of primary consideration, the aspirations of the applicant, the recommendation of a high school counselor, teacher, or principal, and the ability of Calvin to be of service will also be considered in admission decisions. The college admits students of any race, color, and national or ethnic origin.

U.S. and Canadian applicants should submit the following to the office of admissions and financial aid:

1. Completed application form ([www.calvin.edu/apply](http://www.calvin.edu/apply)), including a personal statement;
2. High school transcript;
3. Academic/educational recommendation;
4. ACT or SAT college entrance exam results. Note: Calvin does not require the writing sections of the SAT or ACT, although the ACT writing section is recommended for students interested in teacher education. Canadian students with cumulative marks above 75% are not required to submit ACT or SAT results.
5. Transcript(s) from any college(s) previously attended.

**A non-refundable application fee of \$35 is required, but will be waived for applications received by December 1 (U.S. citizens) and January 1 (Canadian and other international citizens).**

All documents and supporting data required for admission become the property of Calvin and will not be returned to the applicant.

Of the students who submit an application, approximately 75% are accepted. Completed applications are considered on a rolling basis (see deadlines below). Applicants will be notified of an admission decision soon after their files are complete.

## Application deadlines

Completed applications are considered on a rolling basis until the deadlines below. For maximum scholarship consideration, students must be admitted by February 1.

Type	Fall Semester	January Interim	Spring Semester
First-Year	Aug. 15	Dec. 10	Jan. 10
Transfer	Aug. 15	Dec. 10	Jan. 10
Canadian	Aug. 15	N/A	Jan. 10
International	Apr. 1	N/A	Dec. 15 *
Previously admitted and guest students	Students applying for readmission or non-degree seeking students are admitted on a space-available basis until the first day of classes.		

\* Calvin does not accept international applications mid-year unless the student is transferring from a U.S. institution.

## Admission Standards: Requirements for Admission

Applicants with a high school average (GPA) of B-/C+ (2.5 on a 4.0 scale) or higher in college preparatory courses are normally given regular admission if their college entrance test scores meet the guidelines in the table that follows:

### Minimum College Entrance Exam Scores for Admission

ACT Scores (#1968)				SAT Scores (#1095)	
English	Math	Reading	Comp.	or Critical Reading	Math
19	20	16	20	470	470

Applicants with high school or college records or with ACT/SAT scores that do not meet regular admission standards may be admitted if there is other evidence of academic promise. Such students are required to participate in the Access program and take assessments in English and math. They will receive special advising and may register for no more than 15 semester hours including any Access program courses (see academic services pages). They also are encouraged to limit their involvement in extra-curricular activities. Conditions attached to admission must be completed during the student's first year.

Applicants must be high school graduates or have graduated from an equivalent program. Applicants who are at least nineteen years of age but have not completed high school or its equivalent may be granted admission provided they have successfully completed the General Educational Development test (GED) and submit satisfactory scores on one of the entrance examinations.

### Recommended and Required High School Courses for Admission

	Recommended HS Program	Required for Admission
English	4 years	3 years
Math	4 years are recommended for students entering math-related majors, including engineering.	3 years of college prep math are required, beginning with algebra I and including geometry (or a sequence of equivalent courses).
Natural Sciences	2 years: biology, chemistry, or physics; one with a laboratory. Students considering programs in the sciences or health fields, including nursing and engineering, should take biology, chemistry and physics.	2-4 years, with lab experience
Social Sciences	3 years	2-3 years
Foreign Language	2-4 years, ideally the last year in grade 12.	0
Other courses	3 years: a strong college prep program is recommended.	0

## Entrance Examination Information

Most prospective first-year students are required to provide either ACT (Code #1968) or SAT (Code #1095) results. Students are advised to take their college entrance examination during the spring semester of their junior year or in the fall of their senior year. Calvin does not require the writing section of the SAT or ACT. Canadian students with cumulative marks above 75% are not required to submit ACT or SAT results.

The ACT is administered several times throughout the year. Registration forms are generally available from high school counselors or online at [www.act.org](http://www.act.org). This test is also required by the State of Michigan for its competitive scholarship program. Registration

information for the SAT is also available from high schools and at [www.sat.org](http://www.sat.org).

## Profile of Calvin First-Year Students

The middle 50% of the first-year students who enrolled at Calvin in the fall of 2014 had the following academic profile:

- High school GPA: 3.45-3.99 (on a 4.0 scale)
- ACT Composite Score: 23-29
- SAT critical reading plus math: 1080-1290
- The six-year graduation rate for entering first-year students is 74%; most finish a degree in four years carrying a normal course load.
- The first- to second-year retention rate is 87%.

## Dual Enrollment: On-campus and online programs

Dually enrolled students are individuals who are still attending high school but are concurrently enrolled in college courses. The dual enrollment program is administered by participating high schools, and interested students should first inquire at their high school. Students are eligible for dual enrollment until the time of their high school graduation.

Calvin welcomes qualified high school students who wish to be dually enrolled. Students must obtain a letter of permission from their high school counselor or principal which indicates the course(s) they wish to enroll in at Calvin. Students must also complete Calvin's application and indicate the type of dual enrollment course they are seeking: on campus or online. An official high school transcript is also required. No essays, application fees or college entrance exams are required for dual enrollment. Students who wish to enroll as first-year students for the following academic year must subsequently submit essays and results of the ACT or SAT. Students will be notified of their dual enrollment admission and course registration by mail or email.

The cost of dual enrollment is the responsibility of the family, in partnership with their high school. Please refer to the financial services section for more detailed information about costs.

## Early Admission to Specific Academic Programs

Certain academic programs—Nursing, Speech Pathology (MA) and The Calvin Honors Program—offer early admission status to incoming first-year students based on specific academic criteria. In most cases, early admission is determined by information provided in the student's admission file. Please refer to the department website for further details and policies.

## Admission of Transfer Students

Students transferring from other colleges or universities follow the same application procedures as first-year students. Transcripts from all previous colleges attended must be received prior to consideration for admission. ACT or SAT results are also required for transfer applicants with less than two-years of previous college experience. (Canadian transfer students with cumulative marks above 75% are not required to submit ACT or SAT results.) The minimum cumulative GPA for students transferring from a four-year institution is 2.0 and from a two-year college, 2.5. Applicants with averages below the standard or with lower scores are reviewed individually by the committee on admissions.

### Evaluation of Transfer Credit

Transfer credit will normally be awarded for work done in accredited institutions. The courses must be academic and similar in nature to courses offered at Calvin. A minimum grade of C is required in each course to receive credit. No more than seventy semester hours of credit will be allowed for work completed at an accredited community college;

students may transfer community college credit any time during their academic career.

The transfer evaluation process begins with the transfer advisor at the office of the registrar, and may involve academic department chairs, as needed. A list of commonly accepted transfer courses from selected colleges is available online. Courses taken in residence at other accredited institutions are normally accepted, provided they have been approved by the transfer advisor in advance.

Veterans will receive credit, as recommended by the American Council on Education, for liberal arts courses taken through the USAFI and for a maximum of nine semester hours taken by correspondence courses from accredited universities in the program.

For minimum graduation requirements, see the formal bachelor's degree requirements listed in the academic policies section of the catalog.

## Admission of International Students

Calvin welcomes international students who demonstrate their ability to meet the academic standards of the college, who are prepared to do college-level work in English, who will contribute to a Christian learning environment and who show evidence of their ability to pay most of the cost of their education. Students should be certain that Calvin offers the programs they need. The college is authorized under federal law to enroll non-immigrant international students.

To apply for admission, international students are required to submit the following by April 1:

1. International student application form, including a personal statement;
2. Transcripts from high school and/or college(s) attended and the results of any tests required in the student's country;
3. Academic/educational recommendation;
4. Applicable tests and/or demonstration of English language proficiency—see below;
5. Completed financial forms and supporting documents.

**A non-refundable application fee of \$35 is required, but will be waived for applications received before January 1.**

Calvin requires the SAT or ACT for international applicants who are in any one of the following situations: (Calvin does not require the writing sections of the SAT or ACT.)

- Applicants who will have graduated from a high school in the United States
- Applicants who will have graduated from an international school that follows a U.S. high school curriculum
- Applicants who will have graduated from any school where English is the primary language of instruction
- Applicants who will be transferring from another U.S. college or university where she/he has earned less than one-year of credit
- Applicants who are attending a Canadian high school and who have average marks below 75%

International applicants who are not required to submit an SAT or ACT (according to the listing above) must submit the TOEFL, IELTS (International English Language Testing System), or an ELS Level 112 certificate as documentation of English language proficiency. Additional information about mathematics proficiency may also be requested.

Several scholarships are available to international students; some scholarships are awarded based on the results of the ACT or

TOEFL and IELTS minimum scores required for regular admission	
Paper-based TOEFL	550
Computerized TOEFL	213
Internet-based TOEFL	80
IELTS results	6.5
TOEFL code number for Calvin is #1095	

SAT. International students who wish to be considered for Calvin's academic scholarships are encouraged to take the ACT or SAT even though these tests may not be required for admission purposes.

In certain situations, a student with a lower score on either test may be admitted with a provision for further intensive language training (such as ELS) at another institution.

Before enrolling in classes, international students will participate in a self-placement process to select an appropriate English composition course. Normally, students meet with a member of the English department or the office of academic services who will lead them through a collaborative self-placement process, review their materials, and then recommend or require an English composition course or courses. International students who are proficient in a language other than English can use that language to satisfy the foreign language requirement.

## Immigration Procedures for International and Canadian Students

International and Canadian students are required to have a Certificate of Eligibility (I-20) to attend college or university in the United States. An application for the I-20 will be sent to international and Canadian students at the time of their admission to Calvin. Upon receipt of the completed I-20 application, immigration documents will be processed. In addition, an I-901 Fee Remittance is required of all international students with an initial Certificate of Eligibility I-20. Admitted students will receive further information along with the I-20 application.

## Enrollment Deposits for Incoming Students

An enrollment deposit is required of all first-year, transfer, international and readmitted students. This deposit serves as a confirmation of the student's plans to enroll at Calvin. The deposit is first applied toward the student's orientation fee and the remainder is applied to the student's account. Enrollment deposits are not refundable after the due date. If space is available, enrollment deposits will be accepted after the due date.

Type of student	Enrollment Deposit	Due date*: For students starting in ...		
		Jan. Interim	Spring semester	Fall semester
U.S. First-Year	\$300	Dec. 15	Jan. 15	May 1
Transfer	\$300	Dec. 15	Jan. 15	June 1
Canadian	\$300	Dec. 15	Jan. 15	June 1
International	\$2,500	N/A	N/A	June 1 (Deposit required before an I-20 will be issued).
Readmitted students	\$30	Dec. 15	Jan. 15	Aug. 1

\* Enrollment deposits are not refundable beyond the due date. However, enrollment deposits will be accepted after the due date as long as space is available.

## Nondiscriminatory Policy

Calvin does not discriminate with regard to age, race, color, national origin, sex, or disability in any of its education programs or opportunities, employment, or other activities. Questions pertaining to Title IX, which prohibits discrimination based on sex, and Section 504, which prohibits discrimination based on disability, may be directed to Calvin's director of admissions at 3201 Burton Street SE, Grand Rapids, Michigan, 49546, (616) 526-6106.

# Academic Policies and Standards

## Degrees

Calvin College offers the following degrees:

BA	Bachelor of Arts
BS	Bachelor of Science
BCS	Bachelor of Computer Science
BSA	Bachelor of Science in Accountancy
BSPA	Bachelor of Science in Public Accountancy
BME	Bachelor of Music Education
BSE	Bachelor of Science in Engineering
BFA	Bachelor of Fine Arts
BSN	Bachelor of Science in Nursing
BSR	Bachelor of Science in Recreation
BSW	Bachelor of Social Work
BSOT	Bachelor of Science in Letters and Occupational Therapy
MA	Master of Arts in Speech Pathology
MEd	Master of Education

The formal requirements for a Calvin bachelor's degree include the following: successful completion of 124 semester hours, completion of three interim courses of three semester hours or more (transfer students need to complete one interim course for each year they attend Calvin), completion of the designated program of study and the designated core, and a minimum GPA of 2.0 (some programs require a 2.5 GPA) both overall and in the program of concentration. A minimum of four upper level major courses and thirty out of the last sixty semester hours must be completed at Calvin. Not more than five semester hours of basic physical education or eight semester hours in applied music and drama may be applied to graduation requirements except when such courses are a designated part of a required major or minor program. No more than twelve semester hours of internship credit and no more than eight semester hours of independent study may be applied to graduation requirements.

Students who have completed at least fifty-eight semester hours in biology, chemistry, computer science, the earth sciences, engineering, mathematics, physics and psychology may elect to receive a Bachelor of Science degree by submitting a request to the registrar's office. At least twelve of the fifty-eight hours must be from outside the student's primary science department.

Students desiring to earn a second baccalaureate degree from Calvin must meet all of the requirements of the second degree and complete a minimum of 145 semester hours. Students may not obtain more than one Bachelor of Science degree or more than one Bachelor of Arts degree, but may have more than one major within a given degree.

The formal requirements for a Calvin Master of Arts in Speech Pathology are given in the program description within the Communication Arts and Sciences Department section of the catalog. The requirements for a Calvin Master of Education are given in the program description within the Education Department section of the catalog.

## Programs of Concentration (Majors and Minors)

**Majors** – Every degree-seeking student must fulfill the requirements of a faculty-approved departmental or group major. Although such major concentrations are not normally chosen until the second semester of the sophomore year, most programs do presuppose the completion of specific freshman and sophomore courses. Official admission to a major program requires the formal approval of a department or program advisor and the completion of a declaration form. Once a declaration form is completed, a student may access a copy of their Academic Evaluation Report, which details the student's remaining academic requirements.



Whenever students change their major, they must again submit a declaration form for the new major. Teacher education group majors and some departmental majors for teachers may be applied only to teacher certification programs.

To be admitted to a department's major program a student must have earned at least a C (2.0) in each course designated as a prerequisite for admission, unless that department stipulates a C (2.0) average in two or more prerequisite courses. To be admitted to a group concentration a student must have met the GPA required for admission by the primary department within that group. A student not maintaining a minimum average of C (2.0) in the program of concentration may be permitted to remain in that program for a single semester of probation.

The various programs of concentration are specified in the section of the catalog, which describes departmental programs and course offerings. Group majors designed for teacher certification programs are described in the education section.

**Interdisciplinary Majors** – Students may also initiate interdisciplinary majors other than those formally approved by the faculty. Such majors require a minimum of 42 semester hours across three departments.

A minimum of 33 semester hours must be from two departments with no fewer than 14 semester hours from each. At least 6 semester hours of 300-level courses normally must be taken from each of these two departments. A minimum of eight semester hours must be chosen from a third department.

Students must provide a written statement of purpose for such programs. Proposals require the approval of the registrar, two advisors, and the chairs of the departments from which the 33 semester hours are selected. Interdisciplinary major forms are available in the registrar's office.

**Minors** – Optional six-course departmental minors and group minors are possible in certain fields. A 2.0 average in the minor program courses is required for graduation in them. Minors are described in the departmental sections of the catalog. Only those minors described in the education section are approved for teacher certification.

## Overlap Policy

An overlap is defined as one course meeting two or more requirements. Cognate courses are not counted in overlap calculations.

**Overlap between core and majors/minors** – There is no limitation on the number of overlaps permitted between core and any major, minor, cognate, or concentration.

**Overlap between major and minor** – To graduate with a major and a minor a student must complete a minimum of fourteen distinct courses of three semester hours or more. A maximum of two overlaps are permitted between a major and a minor. The details are as follows:

<i>Courses required in the major</i>	<i>Maximum overlaps permitted</i>
8	0
9	1
10 or more	2

**Overlap between two majors** – To graduate with two majors, a student must complete a minimum of sixteen distinct courses of three semester hours or more. A maximum of three overlaps are permitted between two majors (cognate courses are not counted in the overlap calculation). The details are as follows:

<i>Total courses in two majors</i>	<i>Maximum overlaps permitted</i>
16	0
17	1
18	2
19 or more	3

**Overlap between minors** – There may be no overlaps between minors.

## Interim Course

Calvin is on a system under which students take only one three or four semester hour course during the three-week January term, commonly called interim. Most interim classes meet mornings or afternoons, but those involving laboratories and in-service experiences may require full-day participation. Because of their informal and intensive nature, most interim courses have enrollment limits. To meet requirements for a Calvin degree, students must complete at least three interim courses (a course, to meet the interim requirement must be at least three semester hours). Transfer students must complete one interim course for each year in attendance at Calvin and students may not take more than two interim courses in a single department. Interim courses are graded honors (H), satisfactory (S), or unsatisfactory (U), except those courses that satisfy core requirements and other specially designated courses, which are graded in the conventional A–F system. A number of one semester hour Physical Education and Recreation courses are also offered during interim. One of these may be taken in addition to the required three semester hour course.

Members of the community who are not enrolled as students in any college are invited to register as visitors in interim classes if the permission of the instructor is given. Formal admission to the college is not required, but each visitor must register with the registrar's office before attending class. The fee for each course visited is \$55, which includes campus parking privileges. This invitation to visitors extends to off-campus interim courses as well. However, professors leading off-campus courses give first priority to student enrollment; if space is available, visitors may register for the course and pay the costs associated with the off-campus interim and an additional administrative fee of \$50.

## Independent Studies and Tutorials

Calvin College provides the opportunity to do independent research or reading when students have demonstrated their competence in the academic discipline involved and have shown the ability to study on their own initiative. It must be approved by the instructor directing the study, his/her department chair and the registrar's office. It must be subject to the supervision of the instructor during that term. When completed, the course must be given a regular semester letter grade. It shall carry credit of 1 to 4 semester hours. No more than 8 semester hours of such study may be applied toward graduation requirements. Because such projects require considerable time of the instructor as well as of the student, instructors are not obligated to approve an independent study and are expected to limit the number of students accepted.

To be eligible to register for a regular course on a tutorial basis a student must: hold junior, senior, or graduate status; have a cumulative grade point average of at least 3.0; and have completed all of the prerequisites for the course.

## Transfer Policy

Transfer credit will normally be awarded for courses that are:

- Taken at accredited institutions.
- Academic and similar in nature to courses offered at Calvin.
- Completed with a minimum grade of C.
- Represented on an official transcript and authorized by the credit-granting institution.

**Transfer Limits** – Students may transfer a maximum of 70 semester hours from two-year institutions; there is no limit for transfer credit from four-year institutions. Students may transfer coursework at any time during their academic career.

A minimum of 4 upper-level courses in the major and 30 of the last 60 semester hours must be completed at Calvin. Transfer students must complete one interim course for each year they attend Calvin. The following core must be taken at Calvin (transfer credit not accepted): one biblical/theological core course, developing a Christian mind core, cross cultural engagement core, integrative studies core (generally the major capstone course).

**Military credits** – Veterans will receive credit, as recommended by the American Council on Education, for liberal arts courses taken through the USAFI and for a maximum of 9 semester hours taken by correspondence courses from accredited universities in the program.

Transfer evaluation for prospective students - Individuals that apply to Calvin as transfer students will receive an official transfer evaluation with their acceptance letter.

**Transfer process for current students** – Current students must receive pre-approval for transfer work. A list of pre-approved courses is maintained by the registrar and is available online. Departmental chairs and advisors may approve coursework for majors and minors, if the courses are comparable to the Calvin course requirement. The registrar may approve transfer credit for core or for elective credit (hours taken for graduation semester hour minimums).

## Policies for Course Credits and Exemption Examinations

A maximum of 32 semester hours may be obtained through the transfer of non-classroom-based credit. Some students are able to earn advanced college credit in certain subjects.

**Advanced Placement (AP)** – At the time of admission, first-year students may submit scores from an AP examination conducted by the College Board. While the minimum acceptable score is 3 or 4, depending on the test, the amount of credit awarded for higher scores varies. Detailed information is available from the registrar's office. Students may not receive both AP credit and a high school exemption for the same core requirement.

**International Baccalaureate (IB)** – Course credit will be given to students who receive a grade of 5 or higher on Higher-level classes.

**Departmental Examinations** – Some departments offer departmental examinations for some courses. If a department deems it appropriate, regularly enrolled students may meet a course requirement and receive regular academic credit by examination. Only one exam per department may be taken unless prior approval is given by the registrar. Such tests must be taken in lieu of registration for the course and may not be used as repeated courses. Students wishing to take departmental examinations may obtain forms from the registrar's office, the forms are then completed by the departments, indicating the grade received after the student takes the exam. For information on fees associated with these exams, see the financial information pages. The student's performance on the examinations will be recorded on the student's record.

**Non-Traditional Methods** – Calvin students may obtain transfer credit from on-line and correspondence courses that have been previously approved by the registrar's office.

Furthermore, students who have completed appropriate courses in high school may be exempted from certain college course requirements. This is possible in foreign language, and the sciences. Details about these exemptions are listed with the core curriculum. Consult the registrar's office for more information about the ways high school courses satisfy college requirements.

## Student Load and Classification

The typical undergraduate student load is 12 to 17 semester hours per semester. A minimum of 12 credit hours is required for full time status, a load of six hours is considered half time for financial aid purposes (for more information, see financial information pages). The normal course load of 12 to 17 semester hours permits students to register for courses in applied music, basic physical education, and drama in addition to a typical academic load. Non-credit review courses are counted as part of a normal load, and students on probation or condition may be required to limit their load to 12 semester hours. In exceptional cases, a student may apply for permission, at the registrar's office, to carry more than 17 semester hours. Such an application requires the recommendation of the

student's academic advisor or department chair and must be returned to the registrar's office for approval. To be eligible for consideration, the student must have a cumulative GPA of 3.0, must have received no grades of incomplete during the previous two semesters, and is expected to limit outside employment.

Normal progress toward the degree for full-time students requires that a minimum of 12 semester hours be earned each semester. Normal progress also requires the completion of three interim courses. A more typical load is 31 semester hours per year, which enables most students to complete degree requirements in four academic years.

Undergraduate students are classified as first-year students until they have earned 27 semester hours of credit. Students with a minimum of 27 semester hours of credit completed will be classified as sophomores; those with 58, as juniors; and those with 89, as seniors. Classification for the purpose of college records will be revised at the beginning of each academic semester.

## Visitors and Auditors

Members of the community who are not enrolled as students in any college are invited to register as visitors in most lecture classes. Formal admission to the college is not required; however each visitor must obtain permission from the professor and register with the registrar's office, before attending class. A student may not visit a course or course component that is by its nature practical or applied, such as applied music, ensembles, or a lab. The fee for each course visited is \$55 for the semester, which includes campus parking privileges.

Students who are registered for 12–17 non-audit credits do not pay extra for any audited course. For students registered part time (0–5, or 6–11) or for an overload (18 or more) auditing a course costs half of the tuition rate. See financial services pages for tuition rates. Auditors must be formally admitted to the college.

The audited course is listed on the student's academic transcript, but no credit is recorded. Auditors are expected to attend all classes and participate in the assigned activities of the class. They may take all tests and submit assigned papers for evaluation, but they are not required to do so. Auditors may change their registration from audit to credit only during the first nine weeks of the semester; students enrolled in a course for credit may change to audit only during the first nine weeks.

## Enrollment in Seminary Classes

Full-time college students may, as a part of a program worked out with their departmental advisors, carry up to two courses in Calvin Theological Seminary in any one semester. Approval by the registrar of the seminary and the registrar of the college is required, and under no circumstances may credit for a single course be counted toward degree programs in both college and seminary. Full-time seminary students may enroll for not more than two courses in the college provided the registrar of the seminary and the college approve.

## Leave of Absence

Students may be granted an official leave of absence from the college for one academic term. Applications for a leave of absence are considered for exceptional circumstances, and if the student does not plan to attend a different college during the specified term. Exceptional circumstances that generally merit consideration include: medical need(s), compassionate reasons affecting immediate family, reserve military service training, participation in an off-campus program that is not endorsed or approved by Calvin College, or if course(s) needed for graduation will not be offered until a future term.

If approved for a leave of absence, the student will maintain account access, and will not need to reapply for admission at the conclusion of the leave. Application for the leave, and additional information is available at the registrar's office.

## Academic Forgiveness Policy

All students must meet the 2.0 GPA standard for graduation. However, students who have completed course work at Calvin prior to their readmission can invoke an academic forgiveness option. To do so, students must specifically request this option at the time of readmission, and at least five years must have elapsed since their last Calvin attendance date. Under the academic forgiveness policy, grades received in a student's prior academic period at Calvin are excluded from the GPA calculation required for graduation. All course and grade information, even when not included in the GPA calculation, remain on a student's official transcript. The semesters for which academic forgiveness has been granted will be so noted. Only those courses in which a student received a C- or better can be used as semester hour credit toward graduation requirements. Other prior coursework must be repeated or replaced in an approved manner.

## Grading Systems

Grades given during the regular semester are designated by letters A through F, with A signifying excellent work and F signifying failure. Additional possible grades are: I, incomplete; W, authorized withdrawal; and N, unauthorized withdrawal. Grades given for honors credit are preceded by the letter H (i.e., HA-). Once completed, an incomplete remains noted with the new grade; this does not lower the calculated grade (i.e. IA-).

For purposes of averaging grades, the following numerical values or grade points are assigned to each of the above grades: A, four points per course; B, three; C, two; D, one. A plus-grade is computed at three-tenths of a point above these figures and a minus-grade at three-tenths below. Grades for courses completed as transfer credit or in cooperative programs at other colleges and universities are recorded on students' records but are not included in the compilation of their average at Calvin.

**Interim Grades** – Ordinary grades for the interim are H, honors; S, satisfactory; and U, unsatisfactory. These do not carry grade point values and are not averaged in the student's total record, but the student normally receives three semester hours toward the 124 required for graduation for each interim course satisfactorily completed. Interim courses carrying core credit and those that are also taught during the fall and spring semesters are normally graded according to the traditional letter system and will be included in the student's average.

**Graduate Workshops** – Graduate workshops are graded with S and U grades only.

**Audits** – Auditors are given grades of AU. However, if they fail to attend classes, the instructor will report a grade of AUN.

**Withdrawals** – Students may alter their schedules during the first week of classes without grades of W being recorded on their records. After that time, grades of W, authorized withdrawal, will be recorded if they leave courses with the written approval of their instructors by the end of the ninth week of the semester. Students who discontinue classes without permission or notification are not entitled to a grade of W but will be given an N, unauthorized withdrawal. This grade is computed as an F in determining a student's GPA. However, students who withdraw from school at any time with the approval of the registrar and of one of the student deans may be given grades of W in all courses.

**Repeats** – Students may repeat any courses by properly registering for them, but must inform the instructor when they are repeating a course. Only the latest grade, whether higher or lower, shall be included in the compilation of a student's cumulative GPA. The original grade is not expunged from the record, but is noted as a repeated course. A student will not receive additional course credit for repeated courses.

**Incompletes** – If students fail to complete all the required work or to sit for the final examination, instructors may, if they consider a student's reason valid, give a grade of I, incomplete, rather than a grade of F. The grade of I shall be computed as a neutral grade in determining a student's GPA. Students given an I in fall semester or in interim must make up the deficiency by March 15 of the following spring semester; if given an I during the spring semester or summer session, they must make up the deficiency by October 15 of the following fall semester. If they fail to do so, grades of IN will be entered on their records. A grade of F will be altered only if a student reregisters and retakes the course in which it was given. Grades of I are never expunged from the records. When a final grade is received or the deadline is passed a new grade preceded by an I (i.e. IB+) will be rewarded.

## The Dean's List

Full-time students, including graduate students, with a semester GPA of 3.5 or higher and a cumulative grade of 3.3 or higher will be placed on the Dean's List. Part-time students who meet the grade point requirements above and have earned 3 semester hours within the last year and at least 12 semester hours within the last 2 years will be placed on the Dean's List. The Dean's List is compiled at the end of each semester when grade reports are printed. Interim grades and subsequent grade changes normally do not alter the list.

## Academic Probation and Dismissal

Each student admitted to Calvin is assumed to have the preparation, the desire, and the ability to make satisfactory progress toward a degree; however, some students do not make the progress expected of them. Such students are notified that they are placed on academic probation, offered special assistance and academic counseling, and given an opportunity to improve their records.

The records of all undergraduate students are reviewed after each semester, and academic status is determined according to the following schedule:

<i>Total of cumulative semester hours attempted</i>	<i>Minimum cumulative grade point average needed for continuation</i>	<i>Minimum cumulative grade point average needed for good standing</i>	<i>Minimum percent of attempted hours, which must be credited for good standing</i>
16 or fewer	1.0	1.5	66%
17-31	1.30	1.65	66%
32-49	1.45	1.75	68%
50-67	1.60	1.85	70%
68-85	1.75	1.95	72%
86-104	1.90	2.00	74%
105-123	2.00	2.00	77%
124 or more	2.00	2.00	80%

The number of semester hours attempted is the number of hours for which a student is registered at the beginning of the second week of classes. Credited hours are those for which the student has earned credit that applies toward a degree.

Courses that are repeated are counted in the number of courses attempted, but not in the number of semester hours credited. For the purpose of calculating the GPA, incompletes are calculated as a neutral grade until the deadline for completion. If they are not completed by the deadline, a failing grade is assigned.

Students receiving benefits from the Department of Veterans Affairs are placed on academic probation if their GPA falls below 2.00. They must raise their GPA to 2.00 in order

to continue to be certified for these benefits. Prior to enrolling for the final 12 semester hours, students must have earned a cumulative GPA of 2.00. If any student receiving veteran's benefits fails to meet the GPA standard within the prescribed probation period, the school will inform the Veterans Administration. The student will be informed, in writing, that the Veterans Administration has been notified.

A student who does not meet the requirement for continuation is subject to dismissal. Any student whose average falls below the minimum required for good standing is placed on academic probation. In the subsequent semester, students placed on probation must earn a GPA equal to or better than the GPA required for good standing in that semester. Students placed on academic probation will be required to take a number of actions as outlined by the academic review committee and the registrar's office. These actions will include the following:

- Meet regularly with an academic probation counselor,
- Limit enrollment for the subsequent semester, normally to 12 credit hours,
- Limit outside employment and extra-curricular activities.

In addition:

- First year students placed on academic probation will be required to successfully complete an academic support course (normally ASC 111).
- In partnership with the academic probation counselor, all students on academic probation will utilize other appropriate resources.

Failure to meet the specified conditions will constitute grounds for immediate dismissal. Students who fail to meet the standards for good standing during the semester they are on probation are subject to dismissal. Students not permitted to continue may appeal their academic dismissal to the academic review committee. One year must elapse before students dismissed for poor academic performance are eligible to petition for readmission. A request for readmission will be reviewed by the academic review committee and the committee on admissions; readmission following academic dismissal will be based upon evidence that the difficulties previously encountered can be overcome and that eventual completion of degree requirements can reasonably be expected.

## Complaints

Calvin College is committed to an excellent educational experience for students and welcomes opinions and feedback regarding programs, services, and personnel. All students have the right to register a concern regarding a college policy or procedure or a person's behavior as described in the policies referred to below:

- **Challenging the accuracy of student records** – See Calvin's FERPA policy, below.
- **Concerns about academic sanctions given as a result of academic dishonesty** – See the procedures outlined in the Student Handbook.
- **Concerns and appeals regarding faculty, courses, or general teaching effectiveness** – See the Faculty Concerns, Protest, and Appeals section of the Calvin's Student Handbook. Complaints can be registered at any time using the Comment-on-Faculty form, available in the college's online portal.
- **Concerns about online or out-of-state courses** – Students who are taking Calvin courses while in another state may also contact that state to register a complaint. A current list of the states in which Calvin is authorized to offer courses and their complaint procedures can be found on the registrar's website.
- **Discrimination, harassment, retaliation, or abuse of power (whether experienced or witnessed)** – The college encourages the reporting of all perceived incidents of discrimination, harassment or retaliation regardless of the offender's identity or position. Reports may be made to the Safer Spaces Administrator, Todd Hubers, associate vice president for human resources. Reports also may be made via the "I Will Report It" 24/7 designated message line at 616-526-IWRI (616-526-4974) or via the online Comment-on-Faculty form. The Safer Spaces policy outlines the procedures for handling such complaints.

- Discrimination on the basis of disability – See Calvin’s Grievance Procedures for Persons with Disabilities. This policy is published in the Student Handbook.

Calvin College seeks to resolve student concerns in a timely and effective manner. The college is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools. If a student believes that the college’s internal procedures have not adequately addressed his or her concerns, the student may directly register a complaint about the college with the Higher Learning Commission by email (*complaints@hlcommission.org*) or in writing to The Higher Learning Commission; 230 South LaSalle Street, Suite 7-500; Chicago, Illinois 60604-1411.

Questions or concerns about Calvin’s complaint policies should be directed to the provost.

## The Family Education Rights and Privacy Act (FERPA) and Calvin College

The Family Educational Rights and Privacy Act of 1974 helps protect the privacy of student records. It provides for the right to inspect and review information contained in educational records, request an amendment to those records, and to limit disclosure of information from the records. In addition, students have a right to file a complaint with the U.S. Department of Education, if they believe that one of their primary rights has been violated.

### Access and privacy

Students who are currently enrolled at Calvin College or formerly enrolled students, regardless of their age or status in regard to parental dependency, are protected under FERPA. Parents of students termed ‘dependent’ for income tax purposes may have access to the student’s educational records.

With certain exceptions, a student has rights of access to those records which are directly related to him/her and which are maintained by Calvin College. Education records include any records in the possession of an employee which are shared with or accessible to another individual. The records may be handwritten or in the form of print, magnetic tape, film, electronic image, computer storage, or some other medium. This would include transcripts or other records obtained from a school in which a student was previously enrolled.

Official Calvin College transcripts are released only when requested in writing by the students. Transcripts will not be released for students who have failed to meet their financial obligations to the college.

All other requests to inspect and review education records should be submitted by the student in writing to the registrar, dean, department head or other appropriate official, and clearly identify the record(s) that the student wishes to inspect. If the requested record(s) are not maintained by the school official to whom the request was submitted, that official will advise the student of the correct official to whom the request should be addressed.

### Disclosure of information

Calvin may disclose information on a student without violating FERPA through what is known as directory Information. This includes a student’s name, address, telephone number, electronic email address, photograph, date and place of birth, major field of study, participation in officially recognized sports and activities, weight and height of athletes, dates of attendance, grade level, enrollment status (e.g., undergraduate or graduate, full- or part-time), degrees, honors, and awards received. A student may restrict the release of his/her directory information by submitting a signed authorization form to the registrar’s office.

In certain other situations, a student’s written consent is not required to disclose the educational information. Exceptions\* include the disclosure:

- to school officials who have ‘legitimate educational interests’ (see definition below);
- to post-secondary schools in which a student seeks to enroll;



- to federal, state, and/or local education authorities involving an audit or evaluation of compliance with programs;
- in connection with financial aid;
- to state and local authorities pursuant to a state law adopted before November 1974 requiring the disclosure;
- to organizations conducting studies for or on behalf of educational institutions;
- to accrediting organizations;
- to parents of a dependent student;
- to parents of students under age 21 for violations of any law or institutional policy related to the possession of alcohol or controlled substance;
- to comply with judicial order of lawfully issued subpoena, including ex parte orders under the USA Patriot Act;
- in connection with a health or safety emergency;
- of information designated as directory information (see above definition);
- to the student;
- to a victim of an alleged perpetrator of a crime of violence or a non-forcible sex offense;
- in connection with a disciplinary hearing to an alleged victim of a crime of violence;
- concerning sex offenders and other individuals required to register under stated or federal law;

\* *There are some specific conditions to the exceptions noted above, which can be found in the Code of Federal Regulations (Title 34, § 99.31).*

Requests to disclose educational information will always be handled with caution and approached on a case-by-case basis.

### **Challenging accuracy of records**

Students who believe that their education records contain information that is inaccurate or misleading, or is otherwise in violation of their privacy should discuss their problems informally with the person in charge of the records involved. If the problems cannot be resolved, the student may request a formal hearing by the registrar. The request must be made in writing to the registrar who, within seven days after receiving the request, will inform the student of the date, place and time of the hearing. Students may present evidence relevant to the issues raised. The hearing officer who will adjudicate such challenges will be the registrar, or a person designated by the registrar who does not have a direct interest in the outcome of the hearing. The educational records will be corrected or amended in accordance with the decisions of the hearing officer, if the decisions are in favor of the student. If the decisions are unsatisfactory to the student, the student may place with the educational records statements commenting on the information in the records or statements setting forth any reasons for disagreeing with the decisions of the hearing officer. The statements will be placed in the educational records, maintained as part of the student's records, and released whenever the records in question are disclosed.

### **School Officials & Legitimate Educational Interest**

Calvin discloses education records without a student's prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests. A school official is a person employed by Calvin College in an administrative, supervisory, academic or research, or support staff position (including Campus Safety and Health Services personnel); a person or company with whom Calvin has contracted as its agent to provide a services instead of using Calvin employees or officials (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

As school official has a legitimate educational interest if the official needs to review an educational record in order to fulfill his or her professional responsibilities for the college. Please contact the registrar's office with any questions.

### **Complaints**

To file a complaint with the U.S. Department of Education concerning alleged failures by Calvin College to comply with the requirements of FERPA, contact:

Family Policy Compliance Office  
U.S. Department of Education  
400 Maryland Avenue, SW  
Washington, DC 20202-5901

### **Application for Degree and Certificates**

In addition to the formal requirements for degrees, students must satisfy certain technical requirements. Students must complete a declaration of major form and have it signed by their departmental advisor and must meet all of the conditions specified on that form. (These declarations are normally completed during the sophomore or junior year.) Finally, students intending to graduate must file a formal application for a degree at the registrar's office not later than the beginning of the semester in which they expect to graduate. If they are completing teacher education programs, they must also file an application for Michigan certification at the same time they apply for a degree or not later than a semester before they complete the certification requirements.

Students may not participate in the May graduation ceremony unless they are within one semester of meeting their graduation requirements.

Students desiring to graduate with an honors designation must apply for admission to a departmental honors program and meet those requirements and the general honors program requirements. Consult the special academic programs pages for more information.

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# Core Curriculum

## The Core Curriculum: An Engagement with God's World

Life is more than a job. Most students graduating from Calvin will pursue a career in the professions. They will become teachers, accountants, engineers, ministers, architects, research biologists, doctors, speech therapists, lawyers, social workers, nurses, and the like. But whatever their particular employment, they will also become citizens, neighbors, parents, parishioners, consumers, and, more generally, participants in North American culture.

The core curriculum at Calvin is a preparation for life. While the major or the professional program prepares students for the successful pursuit of a job, the core equips students for a life of informed and effective Christian service in contemporary society at large, for an engagement with God's world.

As such, the core curriculum at Calvin participates in a long tradition of liberal arts education, a tradition that stretches back the ancient Greco-Roman world. Originally designed to prepare those free from the necessity of work for a life of public service, the liberal arts course of study began with the “trivium” - logic, rhetoric, and grammar. Logic was to enhance a student's ability to construct and evaluate knowledge claims; rhetoric, to develop the powers of persuasive communication in the public square; grammar, not just to learn the mechanics of a language, but to shape character through exposure to the ideals and examples embedded in the canonical texts of a culture. In short, the aim of the trivium was to render the liberal arts student intelligent, effective, and virtuous.

The goal of the core curriculum at Calvin is likewise divided into three parts: Knowledge, skills, and virtues. The courses in the core are designed to impart a basic knowledge of God, the world, and ourselves; to develop the basic skills in oral, written, and visual communication, cultural discernment, and physical activity; and to cultivate such dispositions as patience, diligence, honesty, charity, and hope that make for a life well-lived—of benefit to others and pleasing to God.

The spirit of the Christian liberal arts curriculum permeates all of the degree programs of the college. Traditionally, most students complete the Bachelor of Arts or the Bachelor of Science degree programs, either of which may include a teacher certification component. Other degrees offered by the college include the Bachelor of Fine Arts, the Bachelor of Music Education, the Bachelor of Science in Recreation, the Bachelor of Science in Nursing, the Bachelor of Science in Accountancy, Bachelor of Science in Public Accountancy, the Bachelor of Science in Engineering, the Bachelor of Social Work, Bachelor of Computer Science, the Master of Arts in Speech Pathology and Audiology and the Master of Education. A Bachelor of Science in Letters and Occupational Therapy is offered cooperatively with Washington University School of Medicine.

Because of the complexity of the Calvin curriculum and the many alternative ways of meeting the formal requirements, students must confer with their advisors regularly in planning their academic programs. Students may graduate under the Calvin catalog in effect at the time of their initial registration or any succeeding catalog as long as the catalog chosen is not more than seven years old when graduation requirements are completed. Students who have not attended the college for more than seven years must re-enter the college under the catalog in effect at the time of re-entry.

## The Core Requirements

In keeping with the tradition of liberal arts education, the core curriculum of Calvin is designed to equip students with the knowledge and skills required for an informed and effective life of Christian service in contemporary society. Strong high school preparation may reduce the number of courses required in the core, and that number may be further reduced by special examinations in any subject.

Required core courses are divided into 4 components: The core gateway, core competencies, core studies, and the core capstone. The core gateway is made up of two courses required of all first-year students: “First Year Seminar” and “Developing a Christian Mind” (DCM). First Year Seminar is a progressive orientation to the mission and community of Calvin College. It is taught during the fall. DCM is a first-year interim course designed to introduce students to a Reformed Christian worldview and its relevance for contemporary issues. First-year students taking a 122 language course during the interim can take a section of DCM in the spring semester. Core competencies, such as written rhetoric and information technology, are best taken early in a student’s career at Calvin, as they advance those skills essential to academic success at the collegiate level. The core studies are designed to introduce students to the primary domains and dimensions of life. Typically, a number of them will overlap with courses required in a student’s major or professional program. The core capstone is comprised of integrative studies courses, typically taken in the junior or senior year, which draw together the broad themes of the core curriculum in connection with a particular theme or discipline. The cross-cultural engagement requirement may be fulfilled in a number of ways: through designated off-campus interim courses; semester abroad programs; or approved semester courses at Calvin with a strong cross-cultural component.

Certain professional-degree programs have a modified core curriculum approved by the faculty. These include accountancy (BSA and BSPA), speech pathology and audiology, engineering (BSE), fine arts (BFA), nursing (BSN), recreation (BSR), social work (BSW) and elementary, secondary and special education programs. Model programs are described within each department.

## CORE GATEWAY

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### Developing a Christian Mind

First-Year Seminar IDIS 150 (Must be taken at Calvin)  
IDIS 149

## CORE COMPETENCIES

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### Written Rhetoric\*

one of the following: ENGL 101 or ENGL 100/102 (two-course, full-year sequence)

\* *Students must complete this requirement with a grade of C or better.*

### Information Technology\*

one course from: IDIS 110; CS 100, 106, 108; ENGR 101

\* *An exemption exam is offered each semester.*

### Rhetoric in Culture

one course from: ART 153; CAS 101, 140, 141, 180, 214; GEOG 261;  
GERM 362; IDIS 102,103; SCES 214, STGH 208

### Health and Fitness\*

Personal Fitness one from: PER 101-119, and  
Leisure and Lifetime one from: PER 120-159, and  
Sport, Dance and Society one from: PER 160-189, KIN 223

\* *A student participating in a varsity or junior varsity sport for a full season is exempt from the corresponding category.*

### Foreign Language\*

one of the following: CHIN 202; DUTC 202; FREN 113, 202; GERM 123, 202;  
GREE 206; JAPN 202; KOR 202; LATN 202, 205, 206;  
SPAN 202, 203; STSP 202, or higher

\* *High school exemption from foreign language requirement is possible. To obtain a high*

school exemption from foreign language a student must have four sequential years in the same foreign language with a C or better for each semester. Students who have taken less than 4 years will be asked to take a language placement test.

At least 2 years of high school foreign language (C or better each term) or one year of college foreign language will be required of students who are in academic programs that have reduced core curriculum requirements (accounting, engineering, fine art, nursing and recreation).

## CORE STUDIES

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### History of the West and the World

one course from: HIST 151 or HIST 152  
Philosophical Foundations PHIL 153

### Biblical Foundations I or Theological Foundations I\*

one course from: REL 121 or REL 131

### Biblical Foundations II or Theological Foundations II\*

(If Rel131) one from: REL 211-224

or

(If Rel121) one from: REL 230-237, 243-251

\* Students must take one religion core course at Calvin.

### Persons in Community\*

one course from: EDUC 202; GEOG 200; PHIL 211; POLS 110; PSYC 151;  
SOC/SOWK 250; STHO 211-212

\* The Persons in Community and Societal Structures in North America categories must be completed with courses from two separate departments.

### Societal Structures in North America\*

one course from: CMS 151, ECON 151, 221, 232, 241; IDIS 205; POLS 101,  
102, 212; SOC 151, 210; STHO 211; STHU 232

\* The Persons in Community and Societal Structures in North America categories must be completed with courses from two separate departments.

### Literature

one course from: CLAS 211; ENGL 200-234, 299; FREN 351, 361;  
GERM 303; GREE 302, 307; LATN 300, 302, 304, 305;  
SPAN 309; STGH 217, SPHO 309, STSP 309, STPE 309

### Global and Historical Studies

one course from: ARTH 232, 233, 241, 243, 245; BIOL 364; DAN 310;  
ECON 236, 237, 337; ENGL 300, 310; ENST 210;  
FREN 362, 363; GEOG 110, 240, 242; HIST 233,  
235, 238, 242, 245, 261, 262, 263, 271; IDS 201;  
MUSC 205; PHIL 225, 226; POLS 207, 271, 276, 277, 279;  
REL 255, 352, 353, 354, 355, 356; SOC 153; SOWK 260;  
SPAN 308, 311; STBR 372; STCH 203, 204; STFR 362;  
STHO 205, 210; STHU 312; STNL 230; STPE 308;  
STSP 212, SPHO 308, STSP 308

### The Arts

one course from: ARTH 101, 102, 234, 235, 237, 238, 239, 240; ARCT 201,  
202; CAS 145, 203, 254, 281, 282, 320, 321; CLAS 221,  
231; DAN 202, 330; EDUC 210; FREN 375; GERM 371;  
MUSC 101, 103, 106, 107, 203, 236; STHU 235

**Mathematics**

one course from: MATH 100, 170, 171, 221; STAT 143, 145; PSYC 255; SOC/SOWK 255

**The Natural World\***

Living one from: BIOL 115, 123, 141, 160

Physical one from: ASTR 110-112, 211, 212; CHEM 101, 103, 104, 105, 115; GEOG 120, 181, 250; GEOL 112, 151, 152, 153, 251; IDIS 160; PHYS 132, 133, 212, 221, 223

Two course sequence The Natural World core category can also be met by any of the following two-course sequences: CHEM 103-104; GEOL 151-152; PHYS 132-133; PHYS 133-235; SCES 121-122

\* High school exemption from one Natural World course requirement is possible. (Students must take one science core at the college level). Students who have taken at least 3 years of upper level high school science (excluding physical or environmental science) with a grade of C or better are eligible for an exemption from either the physical or living Natural World core requirement.

**Cross-Cultural Engagement**

one course from the following options:

IDIS 290 (independent study) taken as a CCE Contract Course\*

\*Students submit a contract form with approval of a supervising instructor prior to obtaining 20 contact hours of cross-cultural experience.

Integral CCE on-campus courses: CAS 303; CS 324; IDIS 190, 192, 193, 194, 196, 290; PSYC 208/209 sequence, 322; SPAN 202 (see department); SOWK 381; an interim course filling CCE; off-campus courses: SPHO 315; STBR 312; STSP 315; STCH 210; STFR 330; STGH 312; STHO 210; STHU 312; STPE 315; STNM 394; STSP 215; an interim course filling CCE

Optional CCE\* on-campus courses: CAS 203; HIST 238; IDIS 393; PHIL 226; SPAN 310

\* To receive CCE credit students must make arrangements with the instructor and complete additional work.

**CORE CAPSTONE****Integrative Studies\***

one course from: ARTS 395; ARTH 397; ARCT 397; BIOL 394-396; BUS 360; CAS 352, 399; CS 384; ECON 395; EDUC 398; ENGL 395; ENGR 339, 340; ENST 395; FREN 394, 395, 396; GEOG 380; GERM 395; HIST 395; IDIS 310, 394; IDS 395; KIN 332; MATH 380; MUSC 308; NURS 380; PHIL 201-205, 207-209, 212, 215, 318, 395, 396; POLS 399; PSYC 399; RECR 310; REL 295; SOC 395; SOWK 381; SPAN 395; SPAUD 599

\* Transfer credit not accepted for integrative studies core.







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# Academic Programs

## The Access Program

The Access program provides an alternative entry into Calvin for students who do not meet regular admission standards, but whose records indicate that they could become successful college students. Admission into this program is determined by the committee on admissions and is based on high school grades, high school course work, ACT/SAT scores, and recommendations. Enrollment by means of this program is offered each year to a limited number of first-year students.

After a student has been selected to be part of the Access program, a mathematics placement test and a writing self-assessment are given to determine course placement in those areas. All Access students are required to take Academic Services Course 112: Strategies for Academic Success. This 3 semester hour course is taken concurrently with a reading-lecture course in which the student learns to apply the concepts taught in ASC 112.

Students in the Access program are assigned to academic advisors who are familiar with program requirements and resources by which academic progress can be achieved. Students in the Access program meet with their advisor in academic services for their first year at Calvin College. Students are very involved in the program during their first semester and additional follow-up occurs during the second semester. For more information, see academic services or visit the Calvin website.

## The Adult Learner Program

Adults who wish to begin a college program or return to college may enroll under the classification of Adult Learner. This classification includes:

1. Adults with no prior college experience and at least a four year interruption in education since high school.
2. Adults transferring into Calvin who have a combination of course work and work experiences equivalent to four years of activity since high school.
3. Post baccalaureate students returning for a second degree or a set of course work related to their emerging interests and commitments.

Adult Learners seeking to complete a degree from Calvin must fulfill requirements for a major and for liberal arts core courses. At least 25% of the semester hours required for graduation and a minimum of four courses in the designated major must be completed at Calvin.

Adult Learners who enter or return to Calvin must complete the new Adult Learner core curriculum. Adult Learners will be required to complete one course in each of the following core areas: developing the Christian mind or biblical/theological studies II, global and historical studies or foreign language competency, written rhetoric, rhetoric in culture, history of the west and the world, philosophical foundations, biblical/theological foundations I, persons in community, societal structures in North America, literature, the arts, mathematics, physical or living world, cross cultural engagement, integrative studies, and a capstone course.

NOTE: Certain programs and majors do not allow this modified liberal arts core. For example, Adult Learners in the teacher education program and the nursing program must fulfill the liberal arts requirements specific to those programs. Adult Learners should seek the advice of an academic advisor from their program or major early in their enrollment at Calvin.

Students seeking classification as an Adult Learner should indicate this when they complete their admission forms. Questions about the Adult Learner classification may be directed to the office of academic services.

## The Honors Program

Calvin offers special opportunities for students of outstanding academic ability throughout their undergraduate education. The Honors Program is intended to provide for the discovery, nurturing, and rewarding of academic excellence, and to prepare outstanding students for leadership in service to the immediate community and the world.

Incoming students are invited to apply for admission to the Honors Program as part of their application to Calvin College. Students accepted into the program will typically have an ACT composite score of 29 or higher (= SAT 1290) or Canadian cumulative marks of 91% or higher. Current students whose cumulative GPA at Calvin is 3.3 or higher are also eligible to participate. Other students may apply to the director by completing the online “Application to Participate in the Honors Program,” available on the Honors Program website.

Students in the Honors Program may register for designated honors courses, contract with a professor to take a regular course for honors credit (for which extra work is required), propose interdisciplinary programs of concentration, and participate in various extracurricular events for honors students. Honors classes generally assume a high level of motivation and initiative on the part of the student and aim at greater depth of learning than a regular class.

To graduate with honors, students must complete at least six honors courses (a minimum of eighteen semester hours with at least two of these courses outside their major), maintain a GPA of at least 3.5, and fulfill any other conditions established by the department in which they major. These departmental requirements are spelled out on the Honors Program website. Regular interim courses with grades of “H” are not counted toward graduation with honors. Students should plan their honors work with their advisors as early as possible. They must also submit an “Application to Graduate with Honors” at the beginning of their final semester.

For further information, contact the director of the Honors Program, B. Berglund (History department), or see the Honors Program website.

## The Rhetoric Across the Curriculum Program

*Minimum Grade in English 101:* As the first step in developing competence in written rhetoric, a minimum grade of C is required of all students receiving credit for English 101.

*Departmental Programs:* All students will meet the Rhetoric Across the Curriculum (RAC) requirements through a departmental rhetoric program.

*Group Majors:* Departments with established departmental rhetoric programs will include provisions for their group majors. When students initiate a group major other than those formally approved by the faculty, they must include plans for meeting the RAC requirements. Students should obtain approval for such plans from their major advisors and the co-directors of RAC.

*Transfer Students:* Students who transfer into a major program should work with their major advisor to determine what they must do to satisfy RAC requirements.

## Professional-degree programs

Information regarding professional-degree programs can be found in the department under which they fall in the academic departments and courses section of the catalog.

## Graduate Programs

The Communication Arts and Sciences Department offers a Master of Arts in Speech Pathology. The Education Department offers a Master of Education in Curriculum and Instruction, Educational Leadership, Learning Disabilities, and Literacy. Information regarding graduate programs can be found in the department under which they fall in the academic departments and courses section of the catalog.

## Pre-professional Programs

The programs in this section prepare students for admission to professional and graduate schools. These courses are taken while students are meeting requirements for a Bachelor of Arts or Bachelor of Science degree in a separately designated major.

### Law

Although law school applicants must have a college degree, there is no prescribed program or major specifically designed for students planning to enter law school. Like most colleges, Calvin does not offer a pre-law major, but rather a pre-law specialization within a student's chosen disciplinary major. Prospective law school applicants should complete the requirements for a Bachelor of Arts degree in their chosen major as prescribed in the core curriculum, taking advantage of the opportunities provided therein to acquire skills, knowledge, and insights useful for the practice of law. The pre-law advisor, J. Westra of the Political Science department, can help students to plan programs and select courses that provide good preparation for law school. The pre-law advisor also can help to guide students through the processes of identifying law as a calling, preparing for the Law School Admission Test (LSAT), and applying to law schools. Pre-law students should declare their interest in the pre-law specialization during academic advising and should plan to attend the pre-law information sessions that are held at the beginning of each fall semester. Pre-law students normally take the LSAT in the spring of their junior year and should apply for admission to law school during the fall of their senior year.

### Medicine, Dentistry, and Veterinary

Students planning to apply to medical, dental, or veterinary schools should consult R. Nyhof of the Biology department, faculty advisor for the pre-medical and pre-dental programs. Students should also note the general college core requirements listed under the core curriculum. For basic information regarding timelines, requirements, etc., Pre-Medical and Pre-Dental students should consult the Pre-Med/Dental website, using the A-Z index on Calvin's home page.

A student may select nearly any major concentration and still meet the entrance requirements for all medical and dental schools. However, nationwide the majority of the applicants to medical and dental schools are science majors.

Pre-Medical students must balance requirements for the Medical College Admission Test (MCAT) with the requirements for medical schools. The MCAT requirements just changed a bit, and many medical schools have not yet followed suit, so there is a discrepancy between them. The Pre-Dental list includes the same courses. We continue to recommend students take Chemistry 103-104, 261-262, Chemistry 303 or 323; and Physics 221-222, Statistics 143 or 145 or Psychology 255, Psychology 151, Sociology 151, and Biology 161 or 141 and 206 or 331. Some schools require a 300-level Biology course. Mathematics 132 or 171 (one semester of calculus) is recommended but required by very few schools. Some dental schools require microbiology, our Biology 207 or 336.

Because a few schools have unique requirements, students should consult with R. Nyhof to determine specific requirements of the schools to which they intend to apply.

Pre-medical and pre-dental students normally take their Medical College Admissions Test (MCAT) or Dental Admissions Test (DAT) in the spring of their junior year and should apply for admission to medical or dental schools during the early summer prior to their senior year.

## Ministry

The department of congregational and ministry studies (CMS) serves as the home of the pre-ministry advising program. A team of advisors connected to this department is committed to guiding students through the process of discerning a call to ministry by means of one-on-one conversations, as well as occasional events and programs held throughout the year. Students interested in ministry should direct any questions to a pre-ministry advisors: M. Lundberg (religion and adjunct CMS), is the coordinator of pre-ministry advising and primary pre-seminary advisor in the fall semester; T.R. Thompson (religion), will have this role during Interim and the spring semester. Other pre-ministry advisors are: T. Cioffi, director of the Jubilee Fellows program; L. Barger Elliott, professor of youth ministry; M. Hulst, college chaplain; and J. Witvliet, director of the Calvin Institute of Christian Worship.

The Association of Theological Schools (ATS) recommends that pre-seminary students develop the ability to think carefully, communicate clearly, and do independent research. Pre-seminary students should also learn about human culture and society, and may find it useful to develop proficiency in biblical languages, Latin, and modern languages. Due to differing expectations from different seminaries, the college has no formal program of pre-seminary study, but rather presents a series of suggested courses that students can consider in consultation with the college's pre-seminary advisors. Pre-seminary students should consult the catalogs of the particular seminaries that they are considering attending for the specific admissions expectations of those schools.

Because many Calvin College students choose to attend Calvin Theological Seminary, and because of the close relationship between the two institutions, the admission requirements of the seminary are included here as an example of typical seminary admissions expectations: Students must meet all of the college's requirements for a bachelor's degree, as well as the admissions requirements of the seminary, including a minimum GPA of 2.67. Calvin Theological Seminary recommends that pre-seminary students emphasize the following areas of study: classical civilization, English, Greek, history, philosophy, psychology, sociology, and theology.

Calvin Seminary's master of divinity (MDiv) program prepares persons for ordained ministry. To enter the MDiv program, pre-seminary students should complete at least two semester length courses each in English (including literature), history, philosophy (preferably history of philosophy), natural science, social science, and speech. Four semesters of Greek are encouraged. In order to fulfill these recommendations, Calvin students should consider including the following courses in their undergraduate programs: Greek 205-206; Philosophy 251 and 252; and Communication Arts and Sciences 101 and 200 (CAS 203 and 240 are recommended).

Calvin Seminary's Master of Arts degrees (with concentrations in evangelism and mission, educational ministries, worship, pastoral care, youth and family ministries, and Bible & theology) prepare persons for leadership in various areas of church ministry. The seminary recommends that students take one college course each in English, literature, philosophy, and speech, as well as two each in history, natural science, and social science. In addition, for the MA in evangelism and missions, one college course is required in cultural anthropology; and for the MA in worship, two college courses are required in music or the arts.

Calvin Seminary's master of theological studies program provides a theological education that emphasizes vocational objectives for students who are not seeking ordination, as well as preparation for further academic study in Bible and theology. It is recommended that college students take at least two semester length courses each in English (including literature), history, philosophy, natural science, and social science. Four semesters of Greek are encouraged.

## Occupational Therapy

Students wishing to enter the field of occupational therapy (OT) must complete a master's degree (MSOT) or a doctoral degree (OTD) in occupational therapy, complete a six-month internship, and pass a national board examination. Calvin students have two options, described below, for preparing for admission to a graduate program in occupational therapy. Students should meet with the pre-occupational therapy advisor, A. Wilstermann of the Biology department to discuss these options and design an academic plan.

### *Completion of Bachelor of Arts or Bachelor of Science Degree*

Admission to most graduate MSOT and OTD programs requires a bachelor's degree. However, a particular major is not required, so long as specified prerequisite courses are taken. Students selecting this option will take courses that fulfill requirements for the completion of a Calvin major of their choice (such as Psychology, Spanish, or Recreation Therapy) in addition to prerequisite courses specified by the graduate occupational therapy programs to which they intend to apply. While requirements vary between graduate schools, prerequisite courses typically include: Biology 141, 205, 206; Psychology 151, 201; and Statistics 143 or Psychology 255. Admission to graduate programs also requires work or volunteer experience in occupational therapy, which can be arranged through the Service-Learning Center at Calvin, and completion of the Graduate Record Exam.

### *3-2 Combined Curriculum Program with Washington University*

Calvin offers a combined curriculum with the Program in Occupational Therapy at Washington University School of Medicine in St. Louis, Missouri. A student participating in this program will spend three years at Calvin completing the coursework listed below (99-100 credits), gaining work or volunteer experience in occupational therapy and completing the Graduate Record Exam. Students that meet admissions requirements will apply to the MSOT or ODT program at Washington University, and if accepted, transfer to Washington University for two additional years of coursework and clinical training. Upon successful completion of the first year of study at Washington University (32 credits), the student will receive a Bachelor of Science in Letters and Occupational Therapy from Calvin. Upon completion of a second year of study, the student will receive a MSOT from Washington University. Alternatively, a student accepted into the OTD program will spend three years at Washington University. It should be noted that admission to graduate OT programs at Washington University is competitive and that 3-2 students are not given preference in admissions decisions. Students that complete the Calvin (three year) portion of the 3-2 program but are not accepted into the graduate program at Washington University, will complete a bachelor's degree of their choice at Calvin and will be eligible to apply to a large number of graduate programs in occupational therapy.

The requirements for the Calvin (three year) portion of the 3-2 Combined Curriculum Program are:

- Biology 141, 205, and 206
- Chemistry 115
- Statistics 143 or Psychology 255
- Physics 223
- Psychology 151, 201, and 212
- Sociology 151 and 153
- Recreation 324 or Kinesiology 215
- Kinesiology 216
- IDIS 110, 149 and 150
- English 101
- Communication Arts and Sciences 101
- Physical Education and Recreation, 3 courses
- Foreign language, through the second year college competency
- History 151 or 152
- Philosophy 153 and 212 (or 205)
- Literature course
- Music 103 or 238
- Religion 121 or 131, and one 200-level course
- Three interim courses
- Cross Cultural Engagement requirement

## Optometry

Students wishing to become optometrists complete a BA or BS degree at Calvin before entering optometry school to complete four additional years of study culminating in the doctor of optometry (OD) degree. Requirements for admission to optometry schools vary, but all require the following:

	Semester hours
Biology 160 and 161	8
Biology 207 or 336	4
Chemistry 103 and 104	8
Chemistry 261 and 262 or 253	5-10
Physics 221 and 222	8
Mathematics 132 or 171	4
Statistics 143	4
English 101 and a literature course	6
Social Science (Psychology 151, Sociology 151)	3-6

Many schools also recommend physiology, anatomy, biochemistry, and a business or economics course. These requirements may be met within the context of a biology major or group science major at Calvin. Students should consult the website of the Association of Schools and Colleges of Optometry ([www.opted.org](http://www.opted.org)) and work with the pre-optometry advisor, J. Ubels, to plan a course of study that meets the requirements of the optometry schools to which they intend to apply. All applicants to optometry school are required to take the Optometry Admission Test (OAT), which is given on computer and may be taken at any time. Most students take the OAT after completion of the junior year of college. Application deadlines at the various optometry schools range from January 1 to April 1.

## Pharmacy

Calvin College does not offer courses in pharmacy; however, students may take courses at Calvin that are prerequisites for acceptance to a pharmacy school. Students interested in a career in pharmacy will complete at least two years at Calvin before transferring to a college of pharmacy to complete four additional years of study culminating in a Doctor of Pharmacy (PharmD) degree. Many schools now prefer that students complete a BS or BA degree before enrolling in pharmacy school. Pre-pharmacy course requirements of the pharmacy schools vary greatly. Some schools do not accept advanced placement credits. Students should carefully consult the American Association of Colleges of Pharmacy website ([www.aacp.org](http://www.aacp.org)) and the websites for the pharmacy schools to which they intend to apply to plan an appropriate course of study. The pre-pharmacy advisor, M. Barbachyn, will assist students in planning a pre-pharmacy curriculum, which most students take in the context of a biochemistry major. Most pharmacy schools require the Pharmacy College Admission Test (PCAT), which should be taken in the fall semester of the student's final year at Calvin.

## Physical Therapy

Students wishing to enter the field of physical therapy (PT) must complete a doctoral degree (DPT) in physical therapy. Students at Calvin can prepare to complete this degree by completing the prerequisite courses for their programs of interest in conjunction with a degree program in any discipline. Students then attend graduate school. Admission to graduate programs in physical therapy is very competitive.

The prerequisite courses depend on the graduate school to which students wish to apply; therefore, students should obtain a list of requirements for each of the graduate schools in which they are interested. Below is a sample list of prerequisite classes for non-biology majors. Students are encouraged to contact an advisor of the pre-physical therapy program, N Meyer, of the Kinesiology department, (Science majors can contact A. Wilstermann)

before they register for classes. Students must also work or volunteer with patients under the supervision of a licensed physical therapist. This can be arranged through the Service-Learning Center at Calvin.

<i>First Year Fall Semester</i> Biology 141 Chemistry 103 Core courses	<i>First Year Spring Semester</i>  Chemistry 104 Core or major concentration courses
<i>Second Year Fall Semester</i> Biology 205 Psychology 151 Core or major concentration courses	<i>Second Year Spring Semester</i> Statistics 143 or Psychology 255 Biology 206 Psychology 201 Core or major concentration courses
<i>Third Year Fall Semester</i> Physics 221 Core or major concentration courses Calculus	<i>Third Year Spring Semester</i> Physics 222 Sociology 151 Core or major concentration courses

### **Physician Assistant**

Students who would like to practice medicine under the supervision of a licensed physician should consider becoming a physician assistant (PA). A physician assistant can record medical histories, perform physical examinations, make diagnoses, counsel patients, order and administer laboratory tests, assist in surgery, set fractures, and prescribe drugs.

Each graduate program determines their prerequisite courses, and since there is so much variability from one program to another, Calvin does not offer a specific program for students who want to prepare for a career of Christian service as a physician assistant. Rather, students can major in any discipline so long as they complete the prerequisite courses for the graduate program to which they intend to apply. Students who desire to pursue a career as a physician assistant should contact R. Nyhof for advice about preparatory courses and hours of direct patient care required by particular clinical training programs.



Academic Departments  
and Courses



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# Academic Departments and Courses

## Description of courses offered by the various departments

The symbols F (fall), I (interim), S (spring), and SS (summer session) indicate when each course is offered. The credit (semester hours) for each course is indicated in parentheses after the course name. Interim course descriptions are made available during the fall semester and are published online.

Faculty members on leave of absence for the academic year are indicated by a (†), those on leave for the first semester by an asterisk (\*), and those on leave the second semester by double asterisks (\*\*).

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## Academic Services

*T. Steenwyk (Director), J. Bosscher (Math Instructor), T. Brophy (Tutor Coordinator), J. DeBoer (Associate Director /Disability Coordinator), G. Amuzie (ESL Instructor), J. DuMez (English Instructor), K. Heys (Academic Instructor)*

The office of academic services provides courses in English composition (English 100 and 102), mathematics (ASC 004 and 005), and college-level learning strategies (ASC 111 and 112). Class sizes and schedules are designed to give opportunity for individual instruction and personal conferences with instructors. All courses include an emphasis on appropriate study methods.

Courses numbered 100 and above carry graduation credit and calculate in the GPA. Courses designated with numbers below 100 do not carry credit for graduation; they are, however, recognized by the office of academic services and the office of financial aid as registered units, and they count toward full-time status and financial aid eligibility. Non-credit courses appear on student transcripts with grades, but do not carry honor points and thus do not calculate in the GPA. Students in the Access Program or on academic probation must successfully complete any required academic services course/s in order to be eligible to continue at the college. Students in the Access program and students on academic probation normally register for a total of not more than 12-14 semester hours including any required non-credit courses. Please see additional information under office of academic services and the Access Program, or visit the academic services website.

### COURSES (ASC)

**004 Mathematics for the Liberal Arts Student** (3). F and S, no credit. This course is taught with a particular emphasis on the development of mathematical thinking and problem solving skills. Topics include properties of real numbers, linear equations and inequalities, polynomials and exponents, and quadratic equations. The course is designed to acquaint students with the algebra skills necessary for success in future CORE courses. Mandatory enrollment in this course is determined by the results of the Math Placement Test given by Student Academic Services. A final grade of C or higher is required for successful completion of the course.

**005 Intermediate Algebra** (3). F and S, no credit. This course presents materials that emphasize the development of problem-solving skills and mathematical reasoning. Topics include graphing of linear and quadratic equations, exponents and polynomials, quadratic and logarithmic functions, and ratios and proportions. The course is designed to prepare students for courses that require some higher mathematical skills, as in some business or science classes. Mandatory enrollment in this course is determined by the results of the Math Placement Test given by Student Academic Services. A final grade of C or higher is required for successful completion of the course.

**111 Academic Transitions** (1). F, S. This course introduces students to select strategies, theories, and approaches to college learning. Students will apply these concepts and will understand the effects of motivation and behavior on learning. Course content is applicable across all academic disciplines. Open to first and second year students; others by permission of the office of academic services.

**112 Strategies for Academic Success** (3). F, S. This course introduces students to theories of learning and motivation. Students will apply these theories to a paired course and to their broader academic studies. This course is relevant for students across all academic disciplines. Open to first year students; others by permission of the office of academic services. Concurrent registration in a selected paired course is required; scheduling must be arranged through the office of academic services.

## **Accountancy**

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The accountancy program at Calvin is intended to prepare students for careers in accounting by balancing a comprehensive survey of accounting courses, various business and economics electives, and the college's strong liberal arts core curriculum. Preparation for a career in accounting can be accomplished by completion of one of two degrees: the Bachelor of Science in Accountancy (BSA) or the Bachelor of Science in Public Accountancy (BSPA). The BSA degree is a four-year program intended for students who want to prepare for careers with a focus in financial accounting. The program requires 54 credit hours in the Business Department and a modified core requirement. Students may also choose to pursue a major in Global Management Accountancy, which is a four-year program designed for students who intend to pursue careers with a focus in management accounting. The program requires 58 credit hours in the Business Department and a modified core requirement. The Bachelor of Science in Public Accountancy (BSPA) degree meets the 150 credit hour education requirement adopted by Michigan and most other states to prepare students who wish to sit for the Certified Public Accountant (CPA) examination. The BSPA requires 65-66 credit hours in the Business Department.

See the Business pages for more information on the Accounting degrees as well as descriptions of course offerings.

## **African and African Diaspora Studies**

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An interdisciplinary minor, African and African Diaspora studies is an integrative program intended to deepen students' understanding of a region of the world, and of widely dispersed cultural traditions, that are of increasing significance to global economics, health policy, international development, and Christian theology. A broad choice of courses is offered, making it possible to adapt the minor to a variety of major programs in the humanities, social sciences, and fine arts. The minor program encompasses study both of Africa and its peoples and of the dispersal of Africans to Europe and the Americas through forced migration and voluntary immigration. Accordingly, students may choose one of two tracks: one that focuses on Africa and the other on the African Diaspora, primarily in the new world. E. Washington of the History Department serves as the director of the AADS minor. D. Hoekema (Philosophy) and E. Washington (History) serve as advisors for this program.

## **AFRICA AND AFRICAN DIASPORA STUDIES MINOR**

(18 semester hours)

IDIS 391

Four courses from one of the tracks listed below

One additional course from the opposite track

No more than one language instruction course, and no more than two interim courses, may be counted toward the requirements for the minor.

### **Africa Track**

Four from Art history 245, Geography 242, English 300, French 362, French 363, History 242, Philosophy 226, Political Science 279, STGH 217, 280, 312 (offered through the semester in Ghana program)

Other courses, including on-campus or off-campus interim courses, may be counted toward the minor requirements with the approval of a program advisor.

### **African Diaspora Track**

Four from English 225, French 362, French 363, History 255, Sociology 252, Sociology 303, Spanish 370 (when appropriate)

Other courses, including on-campus or off-campus interim courses, may be counted toward the minor requirements with the approval of a program advisor.

## **COURSES**

IDIS 391 **Seminar in African and African Diaspora Studies** (3). This course seeks to integrate key conceptual and theoretical frameworks to provide upper level students with a good sense of how multiple disciplines such as history, philosophy, theology, anthropology, and literature engage African Studies and African Diaspora Studies. In this course, common readings will expand from the theoretical and conceptual to representative works on various themes in African and African Diaspora Studies. The primary focus of the course will be on the creation of African-American, Afro-Caribbean, and Afro-Latino identities, and the negotiating processes involved. In our discussions of scholarly work, we will offer criticism and ask pertinent questions from a Reformed Christian worldview. As a senior seminar, the course utilizes a seminar approach where the class discussion and structure derives from interactions with the texts, theories, and ideologies. The course carries an honors option (to be arranged with the professor). Prerequisites: Three courses from the African or African Diaspora minor or by approval of the professor.

## **Archaeology**

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The minor in archaeology may be taken in conjunction with any major. It is designed to serve both those students who wish to study archaeology out of extra-vocational interest and those who wish qualification for graduate programs in archaeology. Students interested should seek faculty advice as specified below.

### **GROUP MINOR IN ARCHAEOLOGY**

(Minimum 18 semester hours; 6 courses)

Interdisciplinary 240

Interdisciplinary 340

One course with archaeological content, including interims and internships at an approved site, chosen from:  
Art History 393, History 393 or an approved interim

One course in archaeological skills chosen from:

Art Studio 250, 256, 300, 356; Biology 323, 346; Computer Science 104 or 108, 112; Engineering 101, 106; Environmental Studies 210, 302; Geography 261, 200; Geology 151, 152, 252, 317; Sociology 153, 253

One course in cultural, historical, or linguistic contexts chosen from:

Architectural History 201; Art History 101, 241, 243, 245, 393; Classics 221; Biology/Geology 313; History 235, 238, 242, 245, 261, 338; Religion 311, 321; two courses in an ancient language, Greek, Latin, and others as available

One additional course chosen from any of the above three categories.

In the above framework, students may select a coherent set of four elective courses with the help and approval of an advisor in the minor program. This selection should be appropriate to their major and in keeping with their chosen interests, specialized skills, and plans for further study. Such a program design could stress specialized interests such as material analysis or computer graphics among others and choices from various fields in old world, new world, or marine archaeology for which field schools are available.

There are no modern language requirements for the archaeology minor, but students should consider where they plan to practice archaeology in their choice of college core language requirements. For old world archaeology the best modern language choices besides English are French or German, while Spanish is useful for much of new world archaeology.

### Supervising and Advising

The group minor in archaeology is administered by an inter-departmental archaeology minor committee. The members of the com-

mittee are B. de Vries (History), Program Coordinator, Y. Kim (Classics/History), R. Stearley (Geology), K. Pomykala (Religion), H. Luttkhuizen (Art), and T. Vandenberg (Sociology).

Interested students should consult the Program Coordinator or a member of the archaeology minor committee for admission to and planning of the archaeology minor.

### COURSES

IDIS 240 **Introduction to Archaeology** (3). F, alternate years. A classroom introduction to archaeology with emphasis on archaeological theory, field work methods, artifact processing, data interpretation, and site conservation. The course is designed to introduce students to the theoretical concepts of archaeology, participation in field work, and the critical reading of archaeological reports in both the old world and new world archaeology. It serves as a prerequisite for Interdisciplinary 340.

IDIS 340 **Field Work in Archaeology** (3-6). Offered in conjunction with field work done by Calvin faculty or qualified field schools of other universities. An off-campus, on-site introduction to archaeological field work designed to expose the student to the methodologies involved in stratigraphic excavation, typological and comparative analysis of artifacts, the use of material remains in the writing of cultural history, and the preservation and presentation of sites. Field school enrollment and placement is overseen by the Archaeology Program Coordinator. Prerequisites: Interdisciplinary 240 and permission of the instructor.

# Art and Art History

Professors A. Greidanus, J. Steensma Hoag, H. Luttkhuizen, \*E. Speyers  
Associate Professors C. Hanson (chair), E. Van Arragon, J. Van Recuwyk  
Assistant Professors Y. Ahn

Calvin's Art Department offers both Bachelor of Arts and Bachelor of Fine Arts degrees. Students opting for a Bachelor of Arts degree may choose from the major concentrations of studio art, art history, art education and graphic design. The department also offers minors in studio art, art history, and architecture. If studio art is selected, concentrations include: photography, sculpture, ceramics, painting, drawing, printmaking and communication design.

The Bachelor of Fine Arts (BFA) program, which has a greater professional emphasis, is described in detail below.

## BACHELOR OF FINE ARTS

(63 semester hours)

Art 153

Art History 101 or Architectural History 201

Art History 102 or Architectural History 202

One from Art History 238, 239, or 240

One Art History Elective

Five from Art Studio 250, 251, 255, 256,  
257, and 258

Four from Art Studio 300, 301, 305, 306,  
307, 308, and 316

Three from Art Studio 350, 351, 355, 356,  
357, 358, and 380

Two electives from Art Studio or Art History

Art Studio 395

Art Studio 399

Recommended cognate

Philosophy 208

Students who are interested in the bachelor of fine arts degree (BFA) program at Calvin should consult with A. Wolpa, faculty advisor for the BFA program.

Before applying for admission to the program, a student must have completed three studio art courses in college. Application forms and information on requirements for admission are available in the department office. Submit applications by the first Wednesday in October or the first Wednesday in March.

A student wishing to obtain a BFA degree in art must successfully complete 124 semester hours, including three interim courses, the regular liberal arts core requirements, with the exception of a reduced foreign language requirement, equivalent to one year in college, and a prescribed program of concentration.

## STUDIO ART MAJOR

(33-34 semester hours)

(Concentrations: drawing, photography,  
painting, sculpture, ceramics, print-  
making, communication design.)

Art 153

Art History 101 or Architectural History 201

Art History 102 or Architectural History 202

Two introduction studio courses

Two intermediate studio courses

One advanced studio course

One art history or studio elective

Art Studio 395

Art Studio 399

Architecture 103 and 203 qualify as studio  
courses for architecture minor.

## GRAPHIC DESIGN MAJOR

(39-40 semester hours)

ARTH 239\* or ARTH 240\*

ARTS 250

ARTS 255

ARTS 256

ARTS 305

ARTS 306 or ARTS 316

ARTS 355

ARTS 395\*

ARTS 399

BUS 160

BUS 203

BUS 360

BUS 380

One from ARTS 380, BUS 359, BUS  
381\*\*, BUS 382\*\*, CAS 285, CAS 305

## Cognates

(3 semester hours)

ECON 221\*

CS 100\*

The Graphic Design Major prepares students interested in working in a commercial or non-profit setting to communicate creatively and effectively through the use of type, layout, design, and photography. Drawing upon the strengths of both the Department of Art and Art History and the Business Department, this major stresses foundational skills in marketing and design. Internships are particularly encouraged and supported.

\*Fills core requirement

\*\*Note BUS 381 and 382 have a prerequisite of Statistics 143.

**STUDIO ART MINOR**

(24 semester hours)

(see concentrations above)

Art 153

Art History 101 or Architectural History 201

Art History 102 or Architectural History 202

Two introduction studio courses

One intermediate studio course

One studio elective

**ART HISTORY MAJOR**

(33-35 semester hours)

Art 153

Art History 101 or Architectural History 201

Art History 102 or Architectural History 202

One from Art History 232, 233, or Classics 221

One from Art History 234, 235, or 237

One from Art History 238, 239, or 240

One from Art History 241, 243, or 245

Two art history electives

Art History 397 or Architectural History 397

Art History 399

Art History majors are encouraged to complete a second foreign language sequence in addition to their core foreign language. Specifically French and German are advantageous for students who want to pursue graduate school.

**ART HISTORY MINOR**

(24 semester hours)

Art 153

Art History 101 or Architectural History 201

Art History 102 or Architectural History 202

One from Art History 232, 233, or Classics 221

One from Art History 234, 235, or 237

One from Art History 238, 239, or 240

One from Art History 241, 243, or 245

**ARCHITECTURE MINOR**

The department of Art and Art History offers a minor in architecture that prepares students for graduate work in the field and ultimately licensing. This minor is combined with a wide variety of possible majors including art, business, engineering, environmental studies, geography, urban studies and others. Students interested in graduate school should plan to complete one full year of physics course work (Physics 221-222) and one semester of calculus (Mathematics 171). ARTS 250 is also recommended. Consult Prof. Y. Ahn to determine the requirements of individual graduate schools.

Architecture 103

Architecture 203

Architecture 201

Architecture 202

Architecture 397

Engineering 181

One from Engineering 202, Sociology 302, Geography 310, or 351

**ART EDUCATION K-12**

**COMPREHENSIVE MAJOR**

**(This includes a minor concentration)**

(54 semester hours)

Art 153

Art Studio 250

Art Studio 255 or 256

Art Studio 257 or 258

Art Studio 251

Five studio art electives (including two intermediate and one advanced)

Art Education 315

Art Education 316

Art Education 359

Art History 101

Art History 102

One from Art History 238, 239, or 240

One from Art History 241, 243, or 245

Art Education 399

Prior to the teaching internship, student must have the approval of the department. Criteria for approval are found in the Teacher Education Program Guidebook, available in the education department.

Students must have earned a grade of C (2.0) or better in Art 153 before applying for the Art education program. See Prof. J. VanReeuwijk.

## **FINE ARTS ELEMENTARY MINOR**

(24 semester hours)

Art Education 315

Communication Arts and Sciences 214

Education 210

Music 239

Elementary Dance Interim or PER 150

One from Art 153, Studio Art 250, Art History 101, 102, Art or Art History interim

One from Communication Arts and Sciences 190, 200, 203, 217, 218, 303, 316, CAS Interim

One from Dance 202, 310, 330, or Dance interim

One from Music 100, 103, 106, 107, 108, 203, 120 (2), 130 (2), 190 (2), or a Music interim

JoAnn VanReeuwijk (Art), Phil Hash (Music) and Debra Freeberg (CAS) are advisors for the fine arts minor.

## **COURSES**

### **Art (ART)**

**153 Visual Culture** (4). F, S. This course focuses on how meaning is made through our visual environment. Students study a wide range of visual forms from contexts including architecture, art history, popular culture and advertising, in order to gain a better understanding of how our contemporary experiences and identities are informed and shaped by images. This course will introduce students to visual images and critically examine their various uses in contemporary culture. Class time is a combination of image analysis, image production, lectures, screenings, field trips and student presentations. Intended for first and second year students. No prerequisite. Materials fee.

### **Art Education (ARTE)**

**315 Introduction to Elementary Art Education** (3). S. This course is an introduction to the field of art education in general as well as art education methods specifically for the elementary school level. This course is designed to meet the needs of the Art Education student (K-12) and is pre-requisite to Art Education 316: Secondary Art Education. It is also designed to meet the needs of the education student taking a fine arts group minor. This course

includes lectures, studio experiences, and collaborative assignments as well as assignments to create art lesson plans, units and a personal philosophy of art education. Partnership opportunities to work with area school children through service learning hours are included. Prerequisites: Education 302/303 or permission of the instructor. Materials fee.

**316 Secondary Art Education** (3). F. This course introduces students to various methods of teaching art in the secondary school and to professional standards in art education. It will also guide prospective teachers in developing a responsible pedagogical approach that they can call their own. To foster greater socio-historical understanding, throughout this course, the function of visual images will be addressed in relation to their cultural setting. This course includes lectures, studio projects, demonstrations, and art teaching experiences with students from area schools. This final component will be met through service learning hours. Materials fee. Prerequisites: Art 153, Art Education 315, Education 302/303.

**359 Seminar in Principles and Practices in Art Teaching** (3). S. This is a course on principles and practices in the teaching of visual art at the elementary and secondary levels. This course must be taken concurrently with Education 346. Students must be admitted into directed teaching by the Art and Education Departments prior to enrollment.

**399 Exhibition** (0). F. Group exhibition of student work, required of senior art education majors for graduation.

### **Art Studio (ARTS)**

**250 Introduction to Drawing** (3). F, S. This course focuses on observational drawing to develop working methods based in seeing. Students will use a variety of materials and techniques to pursue growth through process, practice and critical reflection. Contemporary art and art theory are addressed through images and readings, so students will gain an understanding of various practices in drawing and investigate its conceptual possibilities for their own development. Intended for first and second year students. No prerequisite. Materials fee.

**252 Introduction to Printmaking** (3). S.

This course introduces students to the methodologies and concepts of intaglio printmaking as a foundation for understanding the significance of print strategies within contemporary art. Students will learn how to prepare and manipulate metal plates, print multiple images from a matrix, and curate editions. Processes covered are monotype, drypoint, hard and soft ground etching, and aquatint. In addition, students learn about the properties of handmade and industrially produced paper. The course emphasizes conceptual implications of print, non-toxic techniques, and how to work in the environment of a print shop. Prerequisite: ARTS 250 Intro to Drawing. Materials fee.

**251 Introduction to Painting (3).** F, S. This course introduces students to the painting medium and to a contemporary understanding of the painted image/object. This class initiates technical and visual problems and solutions related to the study of painting (color, form, shape, composition and representation), as well as an investigation of critical issues that include authorship, originality and the objecthood of painting. Students will be expected to produce visually effective paintings through control and execution of the media, as well as paintings that show evidence of a knowledgeable participation in the contemporary discourse of art-making. This course addresses issues surrounding the production of painted images, the tradition of painting and the use of painting as a means to develop observational skills. The class will also focus on developing critical thinking skills, visual discernment and conceptual understanding. These concerns will be reinforced through readings, discussions, demonstrations and critiques. No prerequisite. Materials fee.

**255 Communication Design (3).** S. An introduction to the image-based software as a problem-solving approach to Internet oriented communication design. Emphasis is on developing and integrating visual acuity with software dexterity in order to communicate with meaning and purpose. Typography, illustration, and photography are integrated to develop visual problem-solving skills. Selected projects are designed to develop visual understanding and encourage critical discernment. No prerequisite.

**256 Introduction to Photography (3).** F, S.

An introduction to basic photographic techniques and the process of black and white photography including camera operation, film processing, printing, and presentation. Course work emphasizes visual problems and solutions specific to photography, such as flatness, frame, time, and focus. The ability to produce photographic images with visual effectiveness through control and execution of the media is stressed. Visual and technical abilities will be reinforced through readings, discussions, demonstrations, critiques, and lectures. The history of photography and critical approaches to the media will be introduced and inform the context of study. No prerequisite. Materials fee.

**257 Introduction to Sculpture (3).** F. This class introduces the medium of sculpture through a variety of materials and techniques, building skill sets as well as developing problem solving and decision making. The sculpture process is concerned with form, space, presence, objecthood, the body, time and place. Students will learn to critically examine the medium of sculpture through discussions and critiques. We will discuss contemporary work and theory within the art historical context, and attempt to achieve a relevant definition of sculpture. Through theory, practice and discussion we will understand how to use and develop our gifts in order to glorify God and seek shalom. No prerequisite. Materials fee.

**258 Introduction to Ceramics (3).** F and S. This course introduces students to the basic components of ceramics, including the construction of three-dimensional forms and the organization of space. Students will learn traditional and contemporary methods of working with clay and glazes. Course work addresses visual problems and solutions specific to ceramics, the texture of materials, and the manipulation of space. Visual acuity and technical abilities will be reinforced through readings, discussions, demonstrations, critiques, and lectures. The history of ceramics and critical approaches to the media will lead to an understanding of how three-dimensional forms give shape to ideas and beliefs. No prerequisite. Materials fee.

**300 Intermediate Drawing (3).** F. A further exploration of the activity of drawing. This course emphasizes the critical engagement of visual problems and solutions through the development of a drawing portfolio. The pri-



mary source material for this course is the human figure, utilized for visual and technical investigation of pictorial space, as well as for contemporary critical issues surrounding the representation of the self and others. Materials fee. Prerequisite: Art Studio 250.

**301 Intermediate Painting (3).** S. A further exploration of painting ideas and media. This course emphasizes the critical engagement of visual problems and solutions through the development of a painting portfolio. Students will be expected to participate in ongoing group and individual critiques, discussions of assigned readings, and contribute to the dialogue in a bi-weekly painting seminar. Through critical engagement of contemporary painting practices, this course initiates patterns of individual research in the production of a painting portfolio. Materials fee. Prerequisite: Art Studio 251.

**305 Graphic Design (3).** S. This course focuses on dynamic, interactive interface website design. Using WYSIWYG editors, vector, bitmapped graphics and motion, and MP3 audio are integrated to produce website portals that are usable and intuitive in the visualization of their navigation. Students will learn how to use low-bandwidth, high-impact, image-based software that allows users to navigate through linear, non-linear, spatial, parallel, hierarchical, and matrix timeline structures, which lead to useful, virtual interaction. Projects are designed to construct visual interfaces, which optimize site navigation without programming. Materials fee. Prerequisite: Art Studio 255.

**306 Analogue Photography (3).** A further exploration of the visual and technical aspects of the photographic medium, with study of critical theory specific to analogue photography. A variety of professional equipment, processes and advanced techniques will also be introduced. Course work includes readings, demonstrations, and lectures through the production of effective photographic images. Photographic criticism is addressed through readings, lectures, studio assignments, critiques, and a final project. Materials fee. Prerequisite: Art Studio 256. Not offered 2015–2016.

**307 Intermediate Sculpture (3).** F A further investigation of the visual and technical aspects of sculptural media and organization of space.

This course will require the production of a portfolio of sculptural objects. Special attention will be given to the use of particular production methods, issues of presentation, and the relationship between concept and process. Critical theory specific to sculpture is addressed through readings, lectures, and class projects. Materials fee. Prerequisite: Art Studio 257.

**308 Intermediate Ceramics (3).** F, S. A further investigation of the visual and technical aspects of clay, glazes, and other media. This course will require the production of a portfolio of ceramic objects. Special attention will be given to the use of particular production methods, issues of presentation, and the relationship between concept and process. Critical theory specific to ceramics is addressed through readings, lectures, and class projects. Materials fee. Prerequisite: Art Studio 258.

**316 Digital Photography (3).** F An exploration of the visual and technical aspects of photography with an emphasis on digital media. A study of critical theory specific to digital photography will be addressed. Topics covered will include digital image acquisition, manipulation, storage, and display. Course work includes readings, demonstrations, and lecture through intensive production of digital images. Criticism is addressed through readings, lectures, studio assignments, critiques, and a final project. Materials fee. Prerequisite: Art Studio 256.

**350 Advanced Drawing (3).** F This course addresses individual research and conceptual problem solving through the production of a cohesive portfolio of drawings. Students will be encouraged to experiment with the use of new technologies and non-traditional drawing media. In addition to discussions of assigned readings, students will participate in ongoing group and individual critiques that will focus on the individual development and critical understanding of drawn images and ideas. Materials fee. Prerequisite: Art Studio 300.

**351 Advanced Painting (3).** S. A further investigation of painting ideas and media. This course emphasizes individual research and conceptual problem solving through the production of a portfolio of paintings. As part of this course, students will be encouraged to experiment with new technologies and non-traditional painting media supports. In

addition to helping lead the bi-weekly seminar on contemporary issues in painting, students will participate in ongoing group and individual critiques that will focus on the development of images and ideas toward a cohesive painting portfolio. Materials fee. Prerequisite: Art Studio 301.

**355 Brand Design (3).** S. This course expands site portal design from narrow to broad bandwidth streaming digital imagery. Navigating within time line image frames and MP3 audio will be integrated, calibrated, and coalesced with overlapping clips in order to construct visual narratives which resonate with specific market audiences. Design work flows will be streamlined to optimize the synchronization of audio with vector and bitmapped images, with an emphasis on achieving a portal's predicated performance. Emphasis will be on personal development of technical and imaginative skills. Materials fee. Prerequisite: Art Studio 305.

**356 Advanced Photography (3).** S. An emphasis on individual research and conceptual problem solving in the production of a coherent body of analogue and/or digital photographic work. Class time will consist of critiques on the quality of concept and presentation of idea in student images, in addition to discussions of critical readings. Students will be evaluated on a photography production and a class presentation. Materials fee. Prerequisite: Art Studio 306 or 316. Offered alternate years.

**357 Advanced Sculpture (3).** F This course directs individual research in the production of a cohesive body of sculptural work. Requirements include regular critiques of works in progress and discussions of techniques and critical readings. Student portfolios will be evaluated on the basis of craft, concept, and presentation. Students will examine possible ways in which they can make contributions to the field of sculpture and visual culture. Materials fee. Prerequisite: Art Studio 307.

**358 Advanced Ceramics (3).** F, S. This course directs individual research in the production of a cohesive body of ceramic work. Requirements include regular critiques of works in progress, discussions of techniques, and critical readings. Student portfolios will be evaluated on the basis of craft, concept, and presentation. Students will examine possible ways

in which they can make contributions to the field of ceramics and visual culture. Materials fee. Prerequisite: Art Studio 308.

**380 Internship in Graphic Design (3),** F and S, tutorial. A practicum in which students work ten hours per week for one semester under an employer supervisor and participate in a series of internship seminars. Students apply theoretical, ethical, and technical aspects of graphic design or photography to specific problems in visual communication. Personal journals, assigned design projects and a written reflection with resources list, and regular meetings with supervising instructor are required. This course is intended for Graphic Design majors. Prerequisites: junior status and departmental consultation.

**385 Internship in Visual Studies (3).** F, S, tutorial. A practicum in which students work a minimum of ten hours per week for one semester in an art-related field under the supervision of a studio artist, professional designer, or gallery director. Students will also meet regularly with an instructor on campus to address lessons learned. To enroll in this course, students must submit a written proposal to the chair for approval. This course is not intended for students concentrating in communication design. Prerequisites: Five Art Studio courses and departmental approval.

**390 Independent Study in Studio Art (3).** F, S, tutorial. An advanced course providing opportunities for investigating the use of new techniques or new materials, including mixed-media. To enroll in this course, students must submit a written proposal to the chair for approval. Prerequisites: Five Art Studio courses and departmental approval.

**395 Senior Seminar in Studio Art (3).** F This capstone seminar course for all seniors majoring in studio art examines the integral relationship between the production of visual images and issues of faith. Students will investigate contemporary theories and practices in art production and criticism, while refining their own faith-centered studio practice. In addition, students will address ethical issues related to art making as they prepare for professional careers in art-related fields. Presentations, selected readings and class discussions; completion of a professional art portfolio and artist statement is required.

399 **Exhibition** (0). F, S. Group exhibition of student work, required of senior studio art majors and B.F.A. candidates. Art education students exhibit in the fall semester. All other majors in the spring.

The following art courses may be part of supplementary concentrations in journalism: Art Studio 255, 256, 305, 306, 316, 355, and 356.

### Art History (ARTH)

101 **Introduction to the History of Art I** (4). F, S. This course surveys the history of the visual arts from the Paleolithic era to the Renaissance. Although this course concentrates primarily on the development of the historical and religious traditions of Europe, the artistic traditions of non-Western cultures are also addressed. The course is intended for first- and second-year students.

102 **Introduction to the History of Art II** (4). F, S. This course is a historical survey of the visual arts in Western and non-Western civilization from the Renaissance to the present. It is intended for first- and second-year students.

232 **Early Christian and Byzantine Arts** (3). A historical study of the form and function of visual images in the early Christian and the Byzantine traditions. Special attention will be given to the rise of the cult of saints, to the veneration and destruction of religious icons, and to the relationship between sacred images and the imperial court. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above. Not offered 2015–2016.

233 **Medieval Art** (3). F. A historical study of the form and function of visual images in Western Europe from 400 to 1400. Special attention will be given to the relationship between art and the crusades, to tensions between monastic orders, and to the role of visual images in various kinds of mysticism. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above.

234 **Northern Renaissance Art** (3). S. A historical study of the form and function of visual images in Netherlandish and German cultures from 1400 to 1550. Special attention will be given to the rise of naturalism, to the

relationship between art and religious devotion, and to the emergence of an art market. Jan van Eyck, Hieronymus Bosch, Pieter Bruegel, and Albrecht Dürer are some of the major artists studied. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above.

235 **Italian Renaissance Art** (3). A historical study of the form and function of visual images in Italy from 1300 to 1550. Special attention will be given to the emergence of linear perspective, to the relationship between art and humanism, and to the invention of artistic genius. Giotto, Piero della Francesca, Leonardo da Vinci, and Michelangelo are some of the major artists studied. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above. Not offered 2015–2016.

237 **Baroque and Rococo Art** (3). A historical study of the form and function of visual images in Western Europe and the American colonies during the seventeenth and eighteenth centuries. Special attention will be given to relationship between art and the Catholic Reformation, to the rise of nationalism and modern science, and to the emergence of philosophical aesthetics. Caravaggio, Bernini, Rubens, Rembrandt, Vermeer, and Watteau are some of the major artists studied. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above. Not offered 2015–2016.

238 **Nineteenth-Century Art** (3). S. A historical study of the form and function of nineteenth-century art in Western Europe and the United States, from neo-classicism to impressionism. Special attention will be given to the relationship between art and the politics of revolution, to the cultural implications of industrialization, and to the search for scientific objectivity. David, Delacroix, Goya, Courbet, Manet, and Monet are some of the major artists studied. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above.

239 **Modernism and the Arts** (3). F. A historical study of the form and function of visual images in Western Europe and the United States from 1880 to 1960. Special attention will be given to the rejection of op-

tical naturalism, to the emergence of psychoanalysis, to the World Wars, and to the development of modernism in various intellectual circles. Van Gogh, Cézanne, Matisse, Picasso, and Pollock are some of the major artists studied. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above.

240 **Contemporary Art** (3). A historical study of the form and function of visual images in Western Europe and North America since 1960. Special attention will be given to the collapse of modernism, to the revolution in digital technologies, and to contemporary issues concerning race, cultural identity, and gender. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above. Not offered 2015–2016.

241 **Asian Art** (3). F A historical study of the form and function of visual images in Asian Cultures. Special attention will be given to India, China, and Japan. Students will address the relationship between visual images and political, religious, and social developments in Asia, including the spread of Hinduism, Buddhism, and Islam. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above.

243 **Art of the Americas** (3). A historical study of the form and function of visual images in pre-Columbian and Native American cultures. This course will concentrate on cultural developments before contact with Western civilization, but issues of cultural interaction between Native American and immigrant European cultures will be addressed. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above. Not offered 2015–2016.

245 **African and Oceanic Art** (3). A historical study of the form and function of visual images in the African and Oceanic (Polynesian, Melanesian, and Australian Aboriginal) cultures. Special attention will be given to the relationship between religious commitments and artistic practices within these cultures. Slide lectures and class discussions, a research paper is required. Prerequisite: sophomore standing or above. Not offered 2015–2016

393 **Museum Studies** (3). F, S, tutorial. An advanced course providing opportunities for studying the theory and practice of museum

education and/or exhibition curatorial development and installation. Prerequisites: five courses in Art History and permission of the instructor.

397 **Methods in Art Historiography** (3). S. A capstone seminar for all juniors and seniors majoring in art history, the course aims to provide an understanding of the development of art history as an academic discipline and the major methodological approaches available for engaging art objects. Special attention is paid to connecting these methodological issues to the rest of the art history curriculum including the integration of ethics and faith commitments. In preparing students for future work in art history, the course strives to hone critical thinking skills and instill in students a richer appreciation of the stakes of intellectual positions.

399 **Symposium** (0). Presentation of student research, required of senior art history majors.

## CLAS 221 **Classical Art and Architecture**

### **Architectural Design, History and Criticism (ARCT)**

103 **Architectural Communication and Concept Design I** (3). F This is an introductory architecture class that consists of a design studio and an architectural drawing class. The goal of this course is to provide students with a solid foundation for architectural design and communication. Students are directed to understand the basic design elements and principles; and experience architectural design in an architectonic way through studio work. Students are also introduced to architectural language. Conventional architectural drawings such as orthographic, paraline and perspective drawings are integrated with studio work. As this is an introductory course, students are encouraged to learn about the local architectural scene through field visits. Also listed as Engineering 103. Materials fee.

201 **Architectural History I** (4). F A survey of the history of architecture from the Paleolithic era to the Renaissance. Although this course will concentrate primarily on the development of the historical and religious traditions of Europe, the development of non-Western traditions prior to 1500 will also be addressed. Slide lectures and class discussions. Intended for first- and second-year students.

**202 Architectural History II** (4). S. A survey of the history of architecture from the Renaissance to the present. Although this course will concentrate primarily on the development of the historical and religious traditions of Europe, the development of non-Western traditions after 1500 will also be addressed. Slide lectures and class discussions. Intended for first- and second-year students.

**203 Architectural Communication and Concept Design II** (3). S. A continuation of architectural design 103, introducing pre-architecture students to more complex issues of architectural design, communication, and problem-solving. Course projects and discussions help students to experience architecture as a multi-disciplinary field involving philosophical, geographical, cultural, and sociological issues as well as design issues. Also listed as Engineering 203. Materials fee. Prerequisite: Architectural Design 103.

**380 Internship in Architecture** (3). F, S, tutorial. A practicum in which students work a minimum of ten hours per week for one se-

mester in an architecture-related field under the supervision of a professional designer or design consultant. Students are required to record their experiences (e.g., journaling) and meet regularly with an instructor on campus to address the lessons learned. To enroll in this course, students must submit a written proposal to the chair for approval. Prerequisite: ARCT103 (ENGR181 is highly recommended to obtain computerized drawing capacity to work as a drafter in an architecture firm).

**397 Architectural Theory and Criticism** (3). A capstone seminar course for all juniors and seniors enrolled in the pre-architecture program, which re-examines the integral relationship between architectural theories and faith commitments. Special attention will be given to contemporary criticism. Students will address ethical and religious issues as they address various methods of architectural design and practice in preparation for careers in architecture and urban planning. Imaging and verbal discussions, a course paper is required. Prerequisites: junior or senior standing. Offered even years (e.g. 2014, 2016)

## Asian Studies

The Asian studies curriculum is coordinated by the David and Shirley Hubers Asian Studies Program, an interdisciplinary program made up of several faculty members in various departments. The program director is L. Herzberg, Professor of Chinese. The program offers both major and minor degrees.

The major in Asian studies is described below. The Calvin semester in China (STCH) 203 and 204 may substitute for History 245 or 246 and Philosophy 225. The semester program at the Japan Center for Michigan Universities (JCMU), because its curriculum varies somewhat from year to year, may substitute for such courses as may be decided appropriate by the Director of Asian Studies (L. Herzberg).

### ASIAN STUDIES MAJOR

(39-42 semester hours)

Philosophy 225 or STCH 203

One from History 245, 246, 346 or STCH 204

One from Religion 255, 355 or 356

Four Chinese, four Japanese, or four Korean courses from 101- 312

Five culture classes from (three at the 300-level) Art History 241, Chinese 101- 312, History 235, 245, 246, 272, 346, 371, Japanese 101-312, Korean

101-202, Political Science 277, Religion 354, 355 or 356, STCH 203, 204, 210, Beijing courses, JCMU courses, interim courses in Asia or on Asian topics (no more than two)

### ASIAN STUDIES MINOR

(18-21 semester hours)

One from History 245, 246, 346 or STCH 204

Philosophy 225 or STCH 203

One from Religion 255, 355 or 356

Three from Art History 241, Chinese 101-302, Japanese 101-302, JCMU courses, Korean 101-202, History 235, 245, 246, 272, 346, 371, Korean 101-202, Political Science 277, Religion 354, 355, or 356, STCH 203, 204, 210, one approved interim course.

### COURSES - Korean (KOR)

101 **Elementary Korean I** (4). F. An introductory course in which basic conversational and grammatical skills are taught. The course is based on a communicative approach, aiming for students to be able to communicate in Korean at a basic level and also to have a structural awareness of the language. Major cultural aspects of Korea are also studied in a Christian context. No prerequisites.

102 **Elementary Korean II** (4). S. A continuation of Korean 101, the course continues to focus on basic conversational and grammatical skills. The course is based on a communicative approach, aiming for students to be

able to communicate in Korean at more than a basic level and also to have a functional structural awareness of the language. Major cultural aspects of Korea are also incorporated in a Christian context throughout the course. Prerequisite: Korean 101 or permission of the instructor.

201 **Intermediate Korean I** (4). F. A continuation of Korean 102. Continued study of Korean grammar, with equal emphasis on improving conversational proficiency and on reading and writing Korean, as well as the language as a medium for gaining insight into Korean culture. Prerequisite: Korean 102 or permission of the instructor.

202 **Intermediate Korean II** (4). S. A continuation of Korean 201. Completion of the study of basic grammar and further study of the Korean writing system, with continued emphasis on both speaking and reading. Course goals include conversational and reading comprehension and cultural understanding. Prerequisite: Korean 201 or permission of instructor.

## Astronomy

Professors L. Molnar, M. Walhout (chair)  
Assistant Professor J. Smolinski

Students interested in a career in astronomy or astrophysics should major in physics, minor in astronomy, and plan their program with L. Molnar. The local and remote telescopes and cameras of the Calvin Observatory are available for student use through the director of the observatory, L. Molnar.

The physical world core requirement may be met by Astronomy 110, 111, 112, 211, or 212.

### ASTRONOMY MINOR

(At least 19 semester hours)

Physics 132

Physics 133 or approved astronomy interim

Physics 237

Physics 246

Astronomy 211

Astronomy 212

Astronomy 384 or 395

Students pursuing a physics major and astronomy minor must follow college guidelines for overlap between a major and a minor; this is facilitated by the option in

the physics major of substituting upper-level courses for introductory ones.

### COURSES (ASTR)

110 **Planets, Stars, and Galaxies** (4). F. A survey of the major astronomical objects, including planets, stars, and galaxies, a study of their characteristics and their organization into a dynamic, structured universe, an investigation of the processes now occurring in the universe and the methods used to study them, a presentation of the history and development of the universe. The course examines scientific perspectives on the natural

world, various relationships between science and culture, the role of Christianity in the development of science, and relationships between Christianity and current scientific findings. Not open to students who have taken, or wish to take, Astronomy 111 or 112. Students who meet the prerequisites of Astronomy 211 or 212 are encouraged to take one of those courses instead. Laboratory.

**111 The Solar System** (4). This course is similar to Astronomy 110 in providing an introduction to astronomy from a Christian perspective, but emphasizes the contents of our solar system (ranging from planets and satellites down to meteorites and dust), their interrelatedness, and their development over time. Not open to students who have taken Astronomy 110, but open to students who have taken or plan to take Astronomy 112. Students who meet the prerequisites of Astronomy 211 or 212 are encouraged to take one of those courses instead. Laboratory. Not offered 2015–2016.

**112 Stars, Galaxies, and the Universe** (4). This course is similar to Astronomy 110 in providing an introduction to astronomy from a Christian perspective, but emphasizes objects beyond our solar system (including stars, black holes, and galaxies), their function and development, and how they fit into the structure and development of the universe as a whole. Not open to students who have taken Astronomy 110, but open to students who have taken or plan to take Astronomy 111. Students who meet the prerequisites of Astronomy 211 or 212 are encouraged to take one of these courses instead. Laboratory. Not offered 2015–2016.

**211 Planetary and Stellar Astronomy** (4). S, alternate years. This course is an introduction to modern astronomy and astrophysics for students with some science and mathematics preparation. The first portion of the course includes a study of the planets and other objects in the solar system, including their physical processes and development and the formation of the solar system as a whole. The second portion of the course emphasizes the physical structure of stars, their origin and development, and their end results (white dwarfs, neutron stars, black holes). Students may take both Astronomy 211 and 212, but one is not a prerequisite for the other. Laboratory. Prerequisites: one course in college calculus (such as Mathematics 132, 170 or 171) and one course in high school or college physics, or permission of the instructor.

**212 Galactic Astronomy and Cosmology** (4). S, alternate years. This course is an introduction to modern astronomy and astrophysics for students with some science and mathematics preparation. The first portion of the course includes a study of our own Galaxy, its structure, its contents (including the interstellar medium and dark matter), and its formation and development. The second portion of the course covers other galaxies, including their classification, clustering, and development, as well as active galaxies and quasars. The final portion of the course covers physical cosmology, including expansion of the universe, its age and ultimate fate, and the formation of elements. Students may take both Astronomy 211 and 212, but one is not a prerequisite for the other. Laboratory. Prerequisites: one course in college calculus (such as Mathematics 132, 170 or 171) and one course in high school or college physics, or permission of the instructor. Not offered 2015–2016.

**384 Modern Observational Astronomy** (2). F, alternate years. Students will learn techniques of modern observational astronomy by doing observing projects in each of three wavelength regimes: optical, radio, and one other (e.g., X-ray). Optical observations will use CCD detectors to do multi-color photography, photometry, astrometry, and spectroscopy. Radio observations made with the Very Large Array will be used for interferometric imaging. NASA archival data will be used for other wavelengths. Prerequisite: Concurrent registration in or completion of Astronomy 211 or 212.

**390 Independent Study.** F, I, and S. Independent readings and research in astronomy. Prerequisite: A faculty sponsor and permission of the chair.

**395 Astronomy Research, Writing, and Presentation** (0-3). F, I, and S. Completion of an approved experimental or theoretical research with presentation of results. The research may be done entirely as part of this course or through another avenue (e.g., summer research with a faculty member). Normally, each student is required to submit a formal, written report and to present results in a department seminar and/or poster presentation. This course may be taken up to three times. Prerequisites: A faculty sponsor and approval of the department.

# Biochemistry

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See the department of Chemistry and Biochemistry for a description of the biochemistry major and specific biochemistry courses.

## Biology

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*Professors C. Blankespoor, D. Dornbos, K. Grasman, A. Hoogewerf (chair), D. Koetje, R. Nyhof, J. Ubels, R. Van Dragt, D. Warners,*  
*Associate Professors R. DeJong, A. Shen, J. Wertz, A. Wilstermann*  
*Assistant Professors R. Bebej, D. Proppe*

The Biology Department studies biology in response to the Creator's call to investigate the diversity, organization, and functioning of the living world and to provide a Christian model for its study, care, and keeping. Whether faculty and students study the biological mechanisms by which cells communicate, the flow of water and ions through roots and stems, the foraging behavior of voles, the interactions within ecosystems, or the ethical dilemmas occasioned by technology and discovery, they seek to understand the mechanisms and meaning of life. Graduates of our programs are well equipped to pursue many different vocations, engaging God's world as health care providers, professors, teachers, researchers, biotechnologists, or ecologists.

The Biology Department offers courses and programs for students interested in careers as a biologist, for students intending to pursue post-baccalaureate education, e.g., graduate, medical, dental, or other professional training, and for those interested in teaching at the elementary or secondary school levels. To do this the department offers courses for several major and minor programs, including an integrative biotechnology minor. It also offers a neuroscience emphasis for biology majors and a concentration for environmental science majors, as well as core and pre-professional courses.

Biology majors engage fundamental biological concepts in the five introductory courses: "Ecological and Evolutionary Systems" (Biology 160), "Cellular and Genetic Systems" (Biology 161), "Physiological Systems" (Biology 230), "Research Design and Methodology" (Biology 250) and, concurrently, Biology 295. Thereafter, majors enroll in upper-level (3XX) elective courses covering such topics as genetics, immunology, vertebrate anatomy, global health and environmental sustainability, microbiology, ecosystem management, plant physiology, and animal behavior. Majors perform independent research by completing internships, working directly with faculty in a research laboratory or field setting, or by completing a research-intensive 3XX course. To culminate their studies, students explore complex contemporary issues in a senior capstone course (Biology 395 or 396).

Pre-professional biology courses include "Cell Biology and Genetics for the Health Sciences" (Biology 141), "Human Anatomy" (Biology 205), "Human Physiology" (Biology 206), and "Medical Microbiology" (Biology 207). These serve pre-nursing students as well as non-biology majors planning a career in medicine or an allied health field.

Students seeking general college core credit in biology typically enroll in "Living Systems" (Biology 123) or "Human Biology" (Biology 115). In some cases Biology 141 or Biology 161 may be appropriate.

The department offers a Bachelor of Arts (BA) degree in biology and a Bachelor of Science (BS) degree in biology. The BS course of study has stronger quantitative and research components. Students intent on graduate study in biology or a professional school should complete the coursework required for the BS degree. These students should select cognates that fulfill the admissions requirements for the post-baccalaureate program(s) they intend to pursue.



Students interested in a biology program with a particular emphasis, a biology education major, or a specific graduate program should consult with an appropriate faculty advisor. For specific information see the advising website within the academic services website.

Prerequisite to a program of concentration in biology is a minimum average of C (2.0) in Biology 160, 161, and 230 or approved equivalent courses.

### **BIOLOGY MAJOR (BA)**

(34-35 semester hours)

Biology 160

Biology 161

Biology 230

Biology 250

Biology 295 (taken twice, one concurrently with Biology 250)

Four from Biology 311-364, 385, 390, 399, Chemistry 324, or an approved interim, three of which must have a laboratory component, (Chemistry 383 fulfills the laboratory component for Chemistry 324)

One from Biology 395 or 396

Completion of an externally-normed test (e.g. the biology major field test)

### **Cognates**

(11-17 semester hours)

Chemistry 103 and 104, or Chemistry 105

Statistics 145

One from Computer Science 106, Chemistry 253, 261, Geology 151, Mathematics 132 (or 171), Physics 223, or Psychology 343

### **BIOLOGY MAJOR (BS)**

(38-39 semester hours)

Biology 160

Biology 161

Biology 230

Biology 250

Biology 295 (taken twice, one concurrently with Biology 250)

Four from Biology 311-364, Chemistry 324, or an approved interim, three of which must have a laboratory component, (Chemistry 383 fulfills the laboratory component for Chemistry 324)

One from Biology 354, 385, 399, or an advanced research contract in an advanced course (see department website for contract details)

One from Biology 395 or 396

Completion of an externally-normed test (e.g. the biology major field test)

### **Cognates**

(21-29 semester hours)

Chemistry 103 and 104, or Chemistry 105

Chemistry 253 (or 261)

Statistics 145

Two from Mathematics 132 (or 171), Computer Science 106, Physics 221 or 222

One from Computer Science 106 (if not taken as quantitative cognate above), Chemistry 262, 271, 303, 304, 323, 329, Geology 151, 252, Physics 223, Psychology 343, or a biophysics interim.

Information Systems 141 is recommended for students intent on graduate study in biology or a professional school and who do not take Computer Science 106

### **BIOLOGY MAJOR, NEUROSCIENCE CONCENTRATION (BS)**

(42 semester hours)

Biology 160

Biology 161

Biology 230

Biology 250

Biology 295 (taken twice, one concurrently with Biology 250)

Psychology 343

Psychology 344

Biology 331

Two from Biology 321, 323, 333, 335, 336, 338, or other advisor-approved courses

One from Biology 354, 385, 399, or a research contract in an advanced course (if possible, the research project should be neuroscience-related)

Philosophy 318

Completion of an externally-normed test (e.g., the biology major field test)

### **Cognates**

(25-29 semester hours)

Chemistry 103 and 104, or Chemistry 105

Chemistry 253 (or 261)

Chemistry 303 (or 323)

Statistics 145

Two from Mathematics 132 (or 171), Computer Science 106, Physics 221 or 222

The neuroscience concentration in biology seeks to provide students with an interdisciplinary understanding of neuroscience, giving them a deep understanding of the biological sciences and integrating this knowledge with subject areas as diverse as psychology, chemistry/biochemistry, physics, computer science, and philosophy. This training prepares students for graduate school in neuroscience and professional fields (e.g., medicine, dentistry, clinical psychology, veterinary medicine, physical therapy), as well as careers in biotechnology firms, government laboratories, pharmaceutical companies, education, law, and business. Students considering this concentration should contact R. Bebej, C. Blankespoor, or J. Ubels.

### **BIOLOGY MINOR**

(23-24 semester hours)

Biology 160

Biology 161

Biology 230

Biology 250

Biology 295 (taken concurrently with Biology 250)

Two from Biology 311-364, 385, 390, or 399, Chemistry 324, or an approved interim, one of which must have a laboratory component, (Chemistry 383 fulfills the laboratory component for Chemistry 324)

### **INTEGRATIVE BIOTECHNOLOGY MINOR**

(25-28 semester hours)

One Chemistry sequence from

Chemistry 103 and 104

Chemistry 105 and 201, 230, 253, or 261

Chemistry 103 and Engineering 106

One Biology sequence from

Biology 160 and 161 (Phage sections)

Biology 141 (or 161) and 230

Biology 325

Computer Science 104, 106, or 108

Computer Science 300

The integrative biotechnology minor complements diverse majors, building beneficial skill sets for careers in bioinformatics, genetic counseling, pharmaceutical research, chemical engineering, forensic science, bioremediation, patent law, bioethics, and many other fields. Students considering this minor should contact the biotechnology advisor, D. Koetje.

The college's course overlap policy states that students must have at least 14 unique 3+-credit courses between major and minor programs. Cognate courses do not factor into this total. Only students in the non-ACS chemistry or non-ACS biochemistry major are affected by this policy. If these students take Chemistry 105, then to satisfy the overlap requirement they will need to take one additional chemistry course.

### **ENVIRONMENTAL SCIENCE MAJOR – BIOLOGY EMPHASIS (BS)**

(61-63 semester hours)

Biology 160

Biology 161

Biology 230

Biology 345

Two from Biology 332, 336, 341, 344,

346 (selections may include approved course(s) from Biology 311-364, 385, 390, 399)

Chemistry 103 and 104, or Chemistry 105

Chemistry 253 (or 261 and 262)

Chemistry 271

Chemistry 281

Geology 151

Geology 252

Geology 312

Recommended electives (not required)

Biology 250 and 295 taken concurrently

### **Cognates**

(13 semester hours)

Environmental Studies 210

Environmental Studies 302

Environmental Studies 395

Mathematics 132 (or 171) and Statistics 145

or Mathematics 171, 172, and Statistics 243

For additional information see environmental science, environmental studies program

### **SECONDARY EDUCATION BIOLOGY MAJOR (BA)**

(31 semester hours)

Biology 160

Biology 161

Biology 230

Biology 250

Biology 295 (taken twice, one concurrently with Biology 250)

Biology 331 or 332

- One from Biology 311, 313, 323, 338, 341, 344, 345, 346, 364 (selection may include an approved AuSable Institute course)
- One from Biology 321, 333, 335, 336, or Chemistry 324
- Biology 395
- Completion of an externally-normed test (e.g. the biology major field test)

### **Cognates**

(22-28 semester hours)

- Chemistry 103 and 104, or Chemistry 105
- Chemistry 253 (or 261 and 262)
- Science Education Studies 214
- Science Education Studies 314
- Science Education Studies 359
- Statistics 145

Programs of concentration should be prepared on the basis of current guidelines established by the National Science Teachers Association. The NSTA guidelines recommend study in zoology, botany, physiology, genetics, ecology, microbiology, cell biology/biochemistry, and evolution. A minor in physical science is recommended, and this minor may be constituted of selected cognates. A directed-teaching internship in biology is available only during the spring semester. Prior to the teaching internship, the Biology Department must approve student teachers. Approval criteria may be found in the *Teacher Education Program Guidebook*, available in the Education Department. The advisor for biology teaching major and minor programs is C. Blankespoor.

### **SECONDARY EDUCATION BIOLOGY MINOR**

(28-29 semester hours)

- Biology 160
- Biology 161
- Biology 230
- Biology 250
- Biology 295 (concurrently with Biology 250)
- Two from Biology 311-364, 385, 390, 399, Chemistry 324, or an approved interim. Biology 331 or 332 is recommended.
- Science Education Studies 214 and 314

### **ELEMENTARY AND SECONDARY INTEGRATED SCIENCE STUDIES**

Students in an elementary or secondary education program wishing to major or minor in science should consult the science education section of the catalog.

### **Recommended cognates**

Chemistry courses should be completed by the end of the second year of the program. These cognates are minimum requirements. Students planning to do graduate work in cell and molecular biology are advised to complete both the physics and mathematics cognates and organic chemistry. However, the requirements for any particular post-baccalaureate program may differ. Therefore, students should select cognates that fulfill the admissions requirements of the programs they are interested in pursuing. Those planning careers in environmental biology should consider the environmental science major. Other environmental courses in biology, geology, and natural resources are offered at the AuSable Institute of Environmental Studies in Mancelona, Michigan. Information on AuSable courses is available from the AuSable advisor, D. Warners.

### **Group majors**

A group major in science and mathematics meets the needs of some students, particularly those in professional programs, such as physical therapy and physician assistant. These majors, however, are not appropriate for students planning to attend medical school or graduate school in biology. Group majors require a minimum of twelve courses in natural science and mathematics, ten of which must be from two disciplines with a minimum of four courses from each. The remaining two cognates must be chosen from a third discipline. At least two 300-level courses in one discipline must be included in the ten-course component of this group. Biology 395/396 or equivalent is required. The chairs of the departments involved must approve each program.

### **Recommended schedule for pre-nursing students**

Pre-nursing students should complete the following courses in the indicated sequence.

#### *First-year students*

- Fall term: Biology 141, Chemistry 115
- Spring term: Biology 207

#### *Second-year students*

- Fall term: Biology 205
- Spring term: Biology 206

## Honors

To graduate with honors in the Biology Department, a student must satisfy the college honors program and complete three biology courses with honors, submit an honors thesis, and earn a minimum 3.5 GPA in the major. Of the required biology courses, one will normally be the honors section of Biology 160 or Biology 161. Alternatively, this requirement could be met by contracting with an instructor for honors credit in Biology 141 or 230. The second honors course must be taken from those numbered Biology 300-349, or 364, the details of which may be negotiated by the student and instructor at the time the student registers for the course. The third honors course requirement is the completion with honors of an advanced research course (Biology 385, 354, or 399), or by arranging with an instructor for a research contract in a 300-level course. Normally the investigative research performed in an advanced research or upper-level course will be reported as a scientific research paper that will constitute the honors thesis, and as a public presentation to a scientific audience. Departmental honors students also must enroll in the department seminar course (Biology 295) for a minimum of three semesters. The honors advisor is A. Hoogewerf.

## COURSES (BIOL)

### General College Courses

**115 Human Biology** (4). F, S and SS. This course is a study of the major theories of biology as applied to human beings. The student is introduced to the concepts of cell, genetics, ecology, and evolution through the study of the anatomy, physiology, and development of the human body and health. Students apply these concepts to contemporary issues in human biology, society, and the environment. The laboratory utilizes methods of biological investigation, with an emphasis on human anatomy and physiology. Lectures and laboratories.

**123 Living Systems** (4). F, S, and SS. Students construct comprehensive understandings of living systems, interconnecting foundational biological concepts to contemporary scientific, societal, ethical, and religious issues. Topics covered include ecological and

evolutionary systems (climate change, biodiversity, ecosystem health, natural selection, extinction), human health (nutrition, chronic and infectious diseases, allergies), genetics (mutation, meiosis, heredity, race), and stem cells (mitosis, gene expression). Problem-based learning approaches are employed in this course to examine complex societal challenges, with contemporary problems setting the context for readings, discussions, and laboratory activities that facilitate investigating, thinking, and applying. Three two-hour sessions weekly.

The following interdisciplinary course may be included in concentrations in this department:

IDIS 210 **History of Science** (3).

### Pre-Professional Courses

These courses are intended for non-biology majors who pursue pre-nursing or other pre-professional, especially pre-health care, programs.

**141 Cell Biology and Genetics for the Health Sciences** (4). F, S. This course presents the structures, functions, and evolution of prokaryotic and eukaryotic cells at the molecular, subcellular, and cellular levels. Fundamental concepts of genetics are studied including Mendelian genetics and molecular genetics. The course introduces basic historical, philosophical, and biblical frameworks for the study of biology. Applications of course concepts to contemporary issues in biology are considered. The laboratory consists of investigations in molecular biology, cell biology, and genetics. Lectures and laboratories. Corequisite or prerequisite: Chemistry 103 or 115, or equivalent.

**205 Human Anatomy** (4). F, S, and SS. A study of the structure of human organ systems, including some developmental anatomy and histology. The laboratory will emphasize human anatomy and will include dissection of a cat as a representative mammal and some study of histology. Lectures and laboratories.

**206 Human Physiology** (4). F, S, and SS. An introduction to the essential functions of the human body. How tissues and organs operate and work together provides an understanding of how the body gets, distributes, and utilizes nutrients, moves, eliminates waste,

communicates between tissues and organs, and reproduces. The laboratory introduces basic physiological techniques in an investigative setting. Lectures and laboratories. Prerequisites: Biology 141 (or 161), Chemistry 104, 115 or equivalent.

**207 Medical Microbiology (4).** S. A study of microorganisms and their activities as they relate to human health and disease. Topics include significant events in the current and past history of microbial disease, as well as the classification, structure, metabolism and genetics/genomics of microbes. These topics will be discussed in the context of how they contribute to a beneficial symbiotic relationship between microbes and humans as well as how they are a factor in pathogenicity. Diseases due to bacteria and viruses are emphasized, however human fungal, protozoal and multicellular eukaryotic diseases are also discussed. Three hours of lecture and two two-hour laboratory sessions per week. Prerequisites: Biology 141 (or 161) and Chemistry 104 or 115 or equivalent.

### **Program of Concentration Courses Basic Courses**

These courses are intended for students who pursue a biology—or biotechnology—related major or minor program and for students whose program of concentration requires one or more of the courses.

**160 Ecological and Evolutionary Systems (3), F.** Students examine the basic concepts in ecological and evolutionary biology, and their use to gain insights into adaptive features. Topics include: population genetics and ecology, evolutionary development and speciation, phylogenetics and genomics, adaptive biology, ecosystem dynamics, and biodiversity. Students develop critical thinking skills by applying those concepts to solve biological problems and learn scientific communication skills. They also critically examine Christian perspectives of evolution and environmental stewardship. Lectures and discussions. Biology 160 and 160 Lab are required courses for biology majors. Corequisites: Biology 160 Lab, Chemistry 103 (or 105).

**160 Lab Ecological and Evolutionary Systems Lab (1), F.** Students use prevailing methods to conduct field studies and lab ex-

periments addressing interesting questions about organisms and populations as complex adaptive systems, thereby developing competencies for contemporary ecological and evolutionary biology research. Corequisite: Biology 160

**161 Cellular and Genetic Systems (3).** S. A presentation of the basic concepts in cellular and molecular biology and genetics. Topics include: structure and function of cells and macromolecules; energy and metabolism; cell division and regulation; DNA replication, transcription and translation; genetics; control of gene expression; and cellular mechanisms of development. Students develop critical thinking skills by applying these concepts to a broad array of bioscience problems. Laboratories consist of integrative science research projects that instill scientific competencies and proficiency with the prevailing methodologies in the cellular and molecular biosciences. Lectures. Corequisite: Biology 161 Lab. Prerequisites: Chemistry 103 (or equivalent).

**161 Lab Cellular and Genetic Systems Lab (1).** S. Laboratory for Biology 161. Corequisite: Biology 161.

**230 Physiological Systems (3), F.** An exploration of the physiological function of animals and plants that builds upon ecological and cellular biology concepts and lays a foundation for more advanced studies in the upper level biology courses. The animal physiology section will emphasize vertebrates, and the students will come to an understanding of how cells, organs and the major systems of the body interact to maintain the relatively constant internal conditions known as homeostasis. The plant section of the course will focus on angiosperms and gymnosperms, seeking to inform students of basic plant morphology and anatomy that leads to understanding of growth requirements and physiological processes of plants. Understanding the processes by which plants grow and develop connects students to topics such as ecosystem function, physical transfer of solar to chemical energy, nutrition and human health. Lectures, discussions, and labs. Biology 230 and 230 Lab are required courses for biology majors. Prerequisites: Biology 161 (or 141), Chemistry 104 or 105. Co-requisite: Biology 230 Lab

**230 Lab Physiological Systems Lab** (1), F. Students conduct physiological experiments with animal and plant systems to address interesting physiological questions using prevailing research methods and interpreting their data in light of core physiological concepts. Co-requisite: Biology 230

**250 Research Design and Methodology** (4). S. A combination of field, greenhouse and laboratory studies designed to familiarize students with research at both the cellular and ecological levels of organization. Emphasis will be on framing research questions, experimental design and data interpretation with reference to the published literature, and on the presentation and communication of scientific data. Under faculty direction student teams will develop their own research projects and present the results of their work in written and oral reports. Social, ethical and religious implications of the results of research will be explored. Two three-hour sessions per week. Prerequisites: Biology 160, 161, and 230, Statistics 145. Corequisite: concurrent enrollment in Biology 295 is required.

### Advanced Courses

**311S Field Botany** (4). SS. Taxonomy and ecology of vascular plants as components of natural communities. On site examination of plants in bogs, dunes, marshes, meadows, forests, and swamps. Assigned readings, field trips, and laboratory. Offered as a summer course at AuSable Institute of Environmental Studies located near Mancelona, Michigan. Prerequisite: Biology 160, or an introductory botany course.

**313 Paleontology** (4). S, alternate years. A study of the organisms that once lived on the Earth. Includes an examination of the processes of fossilization and methods of discovering the structure, habitat, and relationship of those organisms, and a review of their distribution and life history. A broad spectrum of organisms is studied with emphasis on invertebrate animals. Lectures, laboratories, field trip. Also listed as Geology 313. Prerequisite: Geology 152 or Biology 160 and 161. Not offered 2015–2016.

**321 Genetics and Development** (4). S. How do we explain the vast diversity in form and function among members of a species? How do we explain the vast diversity in form and

function among all of earth's species? Neither question can be addressed effectively without an understanding of genetics and development. This course examines the nature of biological inheritance and the genetic bases of metazoan development, with a particular emphasis on evolutionary influences. Learning activities will focus on understanding genes and genomes from an evolutionary perspective, and will include lectures, class discussions of scientific papers, laboratory investigations of inheritance and development, and an independent research project. Lectures and laboratories. Prerequisites: Biology 161 or 141, Chemistry 115 and 253 (or 261 and 262).

**323 Comparative Vertebrate Anatomy** (4). S, alternate years. A comparative study of vertebrate structure and of the functional significance of these structural variations. Lectures and laboratories. Credit cannot be applied toward a biology major for both Biology 205 and 323. Prerequisite: Biology 160.

**325 Biotechnology** (4). F, alternate years. How and why do we make recombinant DNAs and transgenic organisms? How and why do we manipulate stem cells? How are these and other forms of biotechnology being applied in medicine, agriculture, industry, forensics, and environmental bioremediation? In reading assignments and discussions, students explore scientific, societal, and Christian perspectives of biotechnology—including biosafety, sustainability, patenting, and ethical concerns. In laboratory exercises, students clone human DNA, express it in bacterial cells, and purify the recombinant protein. Lectures and laboratories. Prerequisites: Biology 161 (or 141), 250, Chemistry 253 (or 261 and 262).

**331 Comparative Animal and Human Physiology** (4). F. A study of the mechanical, physical, and biochemical functions of animals and human beings. Using basic cell and tissue activities as a starting point, this course considers how the various organs, and organ systems operate to provide ways of getting, distributing, and utilizing nutrients, excreting waste, maintaining a near constant internal environment despite changes in the external environment, providing movement, allowing both rapid and slower communications between and among these systems, and reproducing the organism. Lectures and lab-

oratories. Credit cannot be applied toward a biology major for both biology 206 and 331. Prerequisites: Biology 161 (or 141) and 230, Chemistry 253 (or 261 and 262).

**332 Plant Physiology** (4). S, alternate years. How efficient are plants in converting light energy to chemical energy? How closely is the global food supply tied to energy or fresh water supplies? How do plants compete with other plants, animals, pathogens, or survive climate extremes when they are rooted in place? This course relates the form and function of plants across a continuum from the physiological to the ecological, from the perspective of an individual plant and that of a plant canopy. We will discover the unique ways in which plants respond to environmental stressors like water deficits or excesses, or by producing an astounding variety of strange chemicals or structures to fight pathogens and herbivores. Emphasis will be placed on how humans can use plants to produce food using agroecological methods, to address food production capacity in impoverished areas, to sequester atmospheric carbon, or to restore contaminated land areas. Students will use instruments and methods to evaluate physiological plant functions and then conduct independent investigations using those tools. Lectures and laboratories. Prerequisites: Biology 161 (or 141) and 230, Chemistry 253 (or 261 and 262). Not offered 2015–2016.

**333 Immunology and Hematology** (4). F. How does the human body defend against pathogens? How does our defense system distinguish between our own cells and foreign invaders? This study of immunology examines mechanisms underlining the intricate work of the defense network including the innate and adaptive immune systems. Practical topics such as vaccines, AIDS, allergy, transplantation, and autoimmunity also will be discussed. The course includes lectures, class discussions of scientific papers, labs, and an independent research project. Hematologic concepts and practices are addressed in laboratory sessions. Prerequisites: Biology 161 (or 141), 230, and 250, and Chemistry 253 (or 261 and 262).

**335 Cell Physiology** (4). S, alternate years. A study of the function of animal cells with emphasis on events occurring outside the nucleus. Major emphases include the structure of the cell membrane, functions and interrelationships of membrane transporters and ion

channels, synthesis of proteins and targeting of vesicles through the secretory pathway, structure and function of cell surface receptors and their interactions with intracellular signaling pathways, mechanisms of cell motility, and interactions of cells with the extracellular matrix. Concepts will be discussed in the context of historical development, examination of experimental evidence and relationship to the function of tissues and organs. Lectures, problem-based discussions of the primary literature, laboratories. Prerequisites: Biology 160, 161 (or 141) and 230, Chemistry 253 (or 261 and 262); Completion of Biology 206 or Biology 331 highly recommended.

**336 General Microbiology** (4). F. Ever wonder if microbes are important for the well-being of human beings? Do they only infect us and cause disease, spoil food, or promote decay? Why might we have ten times more probiotic bacteria in our digestive tracks than all of our bodily cells combined? In this course students study the immense diversity of microbial life and their creative environmental adaptations. They explore bacteria to remove oil spills, generate electricity, produce biofuels, and manufacture antibiotics. They discuss diseases caused by bacteria, viruses, and other microbes, and study mechanisms by which the immune system defends against such infections. Laboratory sessions focus on common microbiology techniques and include an independent project. Three hours of lecture and two two-hour laboratory sessions per week. Prerequisites: Biology 161 (or 141), 230, and Chemistry 253 (or 261 and 262).

**338 Animal Behavior** (4). S, alternate years. Why do birds sing and bees dance? Why do ravens yell and hyenas laugh? Why are prairie dogs promiscuous and macaws monogamous? This course explores the diverse – and sometimes bizarre – strategies and mechanisms that animals use to solve the same basic problems of life: getting food, avoiding predators, finding mates, raising offspring, and living in groups. Learning activities will focus on understanding animal behavior from ecological and evolutionary perspectives and will include lectures, class discussions of scientific papers, behavioral observations, and an independent research project. Prerequisite: Biology 160. Not offered 2015–2016.

**341 Entomology** (4). F, alternate years. Why are insects the most abundant and diverse animals on earth? What's the difference between a dragonfly and a horse fly? What can fleas, mosquitoes, and lice teach us about human health and disease? Why are insects our friends and our foes? This course explores the bizarre biology of insects and particularly their interaction with humans. Learning activities will focus on understanding entomology from an ecological and evolutionary perspective and will include lectures, class discussions of scientific papers, laboratories exercises on insect morphology and classification, and an independent research project. Prerequisite: Biology 160. Not offered 2015–2016.

**344 Vertebrate Biology** (4). S, alternate years. The lives of vertebrate animals attract our attention in ways unparalleled by other groups of organisms. From grand migrations, to elaborate fossils histories, to the roles vertebrates, including ourselves, play in the functioning of the biosphere, our fascination with these animals drives the programming content of many media outlets today. This course explores the range of vertebrate animals with an emphasis on their evolution, taxonomy, ecology, and conservation. Lectures and laboratories. Prerequisite: Biology 160 and 161 (or 141).

**345 Ecosystem Ecology and Management** (4). F The lives of human beings and countless other creatures are sustained by the goods and services resulting from the proper functioning of earth's ecosystems. As the human population places increasing pressure on these systems, the need for their careful stewardship and management grows. This course provides a detailed study of ecosystem structure and function, with special emphasis on local ecosystems, and the scientific basis for managing and restoring ecosystems. Specific topics include energy flow and nutrient cycling, biodiversity and endangered species management, conservation genetics, population dynamics, landscape ecology, and human dimensions of ecosystem management. Lectures, laboratories, case studies, and field investigations. Lectures and laboratories. Prerequisites: Biology 160 and 161.

**346 Plant Taxonomy** (4). F, alternate years. Identification, nomenclature, and classification of vascular plants. Emphasis will be placed on the practical use of keys to identify

plants in a variety of natural environments, including forests, meadows, and wetlands. Relationships among phyla, families, and species will be explored, particularly in relation to their roles within the ecosystem types where they typically are located. Lectures, laboratories, and field trips. Prerequisite: Biology 160 and 161 (or 141). Not offered 2015–2016.

**364 Global Health, Environment, and Sustainability** (3). F, S. Global health and food matters are best understood within their biological, ecological, and socio-economic contexts. This course explores how processes in these contexts contribute to health and disease, especially as they pertain to international and community development. Food will be utilized as an organizing theme with which to inspect the intimacy of relationships between environmental and human health in both local and global contexts. Globalization presents opportunities and challenges for health and food security and for ecosystem integrity. Development models that enhance these by strengthening human-environment interconnectedness, using responsible technologies, and developing just policies are upheld as exemplars. Prerequisite: Biology 115, 123, or 160.

### Research and Practicum Courses

**290 Directed Research** (1-3). F, I, and S. The student enrolling in this course will be involved in laboratory or library research on a project currently being studied by one or more staff members. Application forms are available from the department office and admission will be determined by the chair and the faculty member directing the project.

**354 Investigations in a Specific Topic** (4). F, I, S. The course is a directed investigation of a topic that will vary depending on the interest and expertise of the instructor. Field and/or laboratory studies will emphasize reading and interpretation of scientific literature, study design, experimental conduct, data collection and analysis, as well as written, multimedia, and/or poster presentations. Two laboratory sessions per week. Prerequisite: permission of the instructor (obtain course application from the department website).

**385 Internship in Biology** (0-4). F, I, S, and SS. This course is an off-campus internship that emphasizes professional application of the



concepts and principles learned as part of a Biology program. A student has responsibilities in a private firm, office, laboratory, a not-for-profit organization, or a government agency. The intern works on a specific project under the direct supervision of an employer-supervisor and a faculty internship coordinator. The intern will meet with the faculty coordinator, will maintain a journal, and must present an oral or written report summarizing the internship experience. The off-campus employer-supervisor will complete an evaluation report on the work of the intern. With faculty approval, this course may satisfy the investigations requirement in the biology major or biotechnology minor. Only one Biology 385, 390, or 399 course may be used to satisfy the requirements for the biology major or biotechnology minor. Prerequisites: At least sophomore standing in biology, a cumulative GPA of 2.0 or better, an average GPA of 2.0 or better in all credited science and mathematics courses, and approval by both the department and the off-campus employer. The internship advisor is J. Ubels.

**390 Independent Study** (1-4). F, I, S, and SS. This course provides the opportunity for a student to conduct library research, or under the direction of a faculty member, to study a subject not currently offered in the biology curriculum. Permission to enroll must be obtained from the department chair and the faculty member directing the project. Requirements will be determined by the supervising faculty member. Only four credit hours of Biology 390 or 399 may be used to satisfy the requirements of the biology major.

**399 Undergraduate Research** (1-4). F, I, S, and SS. Students enrolling in this course will conduct laboratory or field research under the supervision of a faculty member. The project may be part of an ongoing research program of the supervising faculty member. A written thesis on the project will be required, as well as presentation of a poster or seminar to the department. Permission to enroll must be obtained from the department chair and the faculty member directing the project, and with their permission, this course may fulfill the requirement for an upper-level research experience in the biology major. Only four credit hours of Biology 390 or 399 course may be used to satisfy the requirements of the biology major.

### Seminar Course

**295 Biology Seminar.** F, S. No credit. Various topics in biology and related disciplines are presented by visiting speakers, faculty, and students. Biology and biotechnology majors must register for two semesters of Biology 295 ideally during the junior and senior year. Freshman and sophomore students are also encouraged to attend. Majors intending to graduate with honors must register for three semesters of Biology 295.

### Capstone Courses

*Enrollment in these courses assumes senior status in a biologically-oriented program, or permission of the instructor and completion of biblical or theological foundations I, developing a Christian mind, and philosophical foundations.*

**395 Perspectives in Biology** (3). F, S. How do conceptual and technological innovations, worldviews, and the inherent limitations of the scientific enterprise affect the way that biology develops? By studying current literature, students examine how Christian and secular perspectives inform the big challenges of our time, including environmental sustainability, evolutionary science, biotechnology, and the biology of the human organism. Student mastery of biological communication is assessed through written and oral presentations. Prerequisites: senior status in a biologically-oriented program or permission of the instructor, biblical/theological foundations I, IDIS 150, and philosophical foundations.

**396 Perspectives in Medicine** (3). F, S. How do historical and philosophical perspectives affect the science and practice of medicine, particularly the methodology, results, and implications of current medical research? By studying the medical literature students explore societal and ethical issues in medicine, from the status of embryos to end-of-life questions. Student mastery of biological communication is assessed through written and oral presentations. Prerequisites: senior status in a biologically-oriented program or permission of the instructor, biblical/theological foundations I, IDIS 150, and philosophical foundations.

# Business

Professors D. Cook, R. Eames, D. Snyder, L. Van Druenen (chair)

Associate Professors T. Betts, B. Cawley, C. Jen, P. Snyder, J. Stansbury, \* J. Voskuil

Assistant Professors D. Pruis, J. Risner, M. Stansbury

The department has structured its major areas of study so that students may design programs that best prepare them for their chosen careers. The department offers a Bachelor of Arts in Business with concentrations in finance, human resources, marketing, operations management, and entrepreneurship. The department offers a Bachelor of Science in Accountancy and a Bachelor of Science in Public Accountancy. With the Communications Arts and Sciences department, the department offers a degree in Organizational Communication; with the Computer Science department, a major in Information Systems; with the Art and Art History department, a major in Graphic Design; and with the Kinesiology department, a major in Kinesiology with a Sports Management emphasis. There is also a group major in business and mathematics.

Students may choose a minor in business or accounting which complements many majors such as art, languages, economics, political science, information systems, kinesiology and more.

Experiential learning is encouraged and there are many opportunities that can be included in any of the department's majors.

Honors work is encouraged in any department course by arrangement with the professor for the course. An introductory honors course in business foundations is offered. To graduate with honors in business, discuss the requirements with the department chair or a business academic advisor.

## BUSINESS MAJOR

The business major provides a thorough understanding of business and the context in which it operates. The business curriculum is designed to progressively develop the knowledge and skills relevant to contemporary business, and to develop depth in an area of business concentration chosen by the student.

A grade of at least a C in Business 203 is required to be accepted into this major.

(40–43 semester hours)

Business 160

Business 203

Business 204

Business 360

Business 362

Business 370

Business 380

Business 396

Business 397

Economics 221

Economics 222

One concentration within the business major

## CONCENTRATIONS

Finance

Business 371

One from Business 359, 372, Economics 326, 331

Human Resources

Business 365

One from Business 359, 366, Economics 335, Psychology 310

Marketing

Business 382

One from Business 381, 359,

Communication Arts and Sciences 285

Operations

Business 363

Business 364

Entrepreneurship

Business 367

Business 368

One from Business 350, 363, 365

## Cognates

(5 semester hours)

One from Statistics 143, 243, or 343

Information Systems 171

## BUSINESS MINOR

(18-19 semester hours)

Business 160

Business 203

Economics 221

Economics 222

Two business electives

## **BACHELOR OF SCIENCE IN ACCOUNTANCY (BSA)**

The Bachelor of Science in Accountancy degree is intended for students who want to prepare for careers with a focus in financial accounting in the context of a Christian liberal arts education. Students who enroll in this four-year program find positions in banking, industry, and not-for-profit institutions. The program requires 54-56 credit hours in the Business Department plus cognates and a modified core. All core categories must be met by this degree with the exception of one year in a foreign language and one of the courses in religion.

A grade of at least a C in Business 203 and in Business 204 is required to be accepted into this major.

(54–56 semester hours)

Business 160  
Business 203  
Business 204  
Business 205  
Business 301  
Business 302  
Business 305  
Business 306  
One from Business 307, 310, 311, or 312  
Business 315  
Business 350  
Business 360  
Business 362  
Business 370  
Business 380  
One from Business 363, 365, 367, 368,  
371, 372, 396, 397, Economics 325,  
326, 331, 334, 335, 338, 339

### **Cognates**

(11 semester hours)

Economics 221  
Economics 222  
Statistics 143, 243, or 343  
Information Systems 171

## **GLOBAL MANAGEMENT ACCOUNTANCY MAJOR (BSA)**

The Global Management Accountancy major is intended for students who want to prepare for a career in management accounting, particularly those seeking either the Certified Management Accountant designation or the Chartered Global Management Accountant certification. The program requires 58 credit

hours in the Business Department plus cognates and a modified core. All core categories must be met by this degree with the exception of the second religion requirement.

A grade of at least a C in Business 203 and in Business 204 is required to be accepted into this major.

(58 semester hours)

Business 160  
Business 203  
Business 204  
Business 205  
Business 301  
Business 302  
Business 305  
Business 310  
Business 315  
Business 358 or 359  
Business 360  
Business 362  
Business 363  
Business 364  
Business 370  
Business 380  
Business 396

### **Cognates**

(11 semester hours)

Economics 221  
Economics 222  
Statistics 143, 243, or 343  
Information Systems 171

## **BACHELOR OF SCIENCE IN PUBLIC ACCOUNTANCY (BSPA)**

The BSPA is a five-year program designed to meet the 150 hours of education requirement adopted by Michigan and most other states for Certified Public Accountant (CPA) certification. The program requires 65-66 semester hours in the Business Department plus cognates. All core categories must be met for this degree with a two course reduction in the foreign language requirement.

A grade of at least a C in Business 203 and Business 204 is required to be accepted into the major.

(65–66 semester hours)

Business 160  
Business 203  
Business 204  
Business 205  
Business 301  
Business 302

Business 305  
 Business 306  
 Business 307  
 Business 310  
 Business 311  
 Business 312  
 Business 315  
 Business 350  
 Business 360  
 Business 362  
 Business 370  
 Business 380  
 Two from Business 363, 365, 367, 368,  
 371, 372, 396, 397, Economics 325,  
 326, 331, 334, 335, 338, 339

### Cognates

(11 semester hours)

Economics 221

Economics 222

Statistics 143, 243, or 343

Information Systems 171

### ACCOUNTING MINOR

(20–22 semester hours)

Business 160

Business 203

Business 204

Business 205

Business 301

One accounting elective\*

\*Two accounting electives for students  
 majoring in Business

### BUSINESS/MATHEMATICS GROUP MAJOR

This major is designed to provide basic courses in business and economics as well as several mathematics courses. Please see the Mathematics department for the details of this major. A grade of at least a C in Business 203 is required to be accepted into this major.

### COURSES (BUS)

160 **Business Foundations** (3). F, S. A survey introduction to business in its economic and global contexts and its functional areas (including accounting, finance, human resources management, marketing, and operations), with reflection on the roles of the legal, moral, ethical, and social responsibilities of business in society. The course emphasizes an integrated Christian view of business, considering its societal context, disciplines,

and the role of management, and allows students to grow in their ability to think critically and analytically. Students will complete various assessment tests and evaluations to help them in determining what career path(s) they may want to pursue, whether in business or another area of concentration.

160H **Business Foundations** (3). F. A survey introduction to business in its economic and global contexts and its functional areas (including accounting, finance, human resources management, marketing, and operations), with reflection on the roles of the legal, moral, ethical, and social responsibilities of business in society. The course emphasizes an integrated Christian view of business, considering its societal context, disciplines, and the role of management, and allows students to grow in their ability to think critically and analytically. Students will complete various assessment tests and evaluations to help them in determining what career path(s) they may want to pursue, whether in business or another area of concentration. The honors section will include additional experiential learning opportunities, and team assignments involving functional and cross-functional areas of an organization. Enrollment in honors Business 160 is limited to 20 students. Business 160 is a requirement in all Business majors and minors. For more information, contact Professor J. Risner.

203 **Introduction to Managerial Accounting** (3). F, S. After a brief introduction to the principles of financial accounting and the purpose of financial statements, the course provides an introduction to managerial accounting concepts, budgeting, incremental cost and profit analysis, breakeven analysis, responsibility reporting, and the use of financial analysis for managerial decision-making. May not be taken concurrently with Business 204. Prerequisite: Business 160.

204 **Financial Accounting** (4). F, S. After considering the importance of generally accepted accounting principles and the study of the accounting cycle, the course emphasizes asset valuation, classification, and measurement of liabilities, and income determination. May not be taken concurrently with Business 203. Prerequisite: Information Systems 171 (may be taken concurrently), Business 160.

**205 Financial Reporting and Analysis (3).** S. This course takes a stakeholder-oriented approach to the study of financial reporting and analysis. Students will evaluate the role of the statement of operations, the statement of financial position, the statement of cash flows, footnote disclosures, management discussion and analysis, SEC filings, and the annual report in the financial reporting process. Topics include a comparison of US GAAP and International Financial Reporting Standards (IFRS), the effects of alternative accounting methods on financial analysis, and the analysis of past firm performance and forecasts of future performance. Students will analyze financial statements and related data to derive estimates and develop inferences useful in business decisions and evaluate organizational efficiency, financial condition, profitability, liquidity, and solvency by means of ratio analysis, common-size analysis, trend analysis and industry comparisons. Prerequisite: Business 204.

**301 Intermediate Accounting (4).** F A study of financial accounting theory and generally accepted accounting principles as applied to the measurement and valuation of assets and liabilities. Prerequisites: A grade of at least a C in Business 204.

**302 Intermediate Accounting II (4).** S. Continuation of Business 301. A study of financial accounting theory and generally accepted accounting principles as applied to the measurement and valuation of assets, liabilities, stockholders' equity, issues related to income determination, and preparation and analysis of corporate financial statements. Prerequisite: Business 301.

**305 Cost Accounting (4).** S. Principles and methods of accounting for manufacturing and operating costs, with emphasis on analysis and reporting to management to facilitate planning, control, and decision-making. Prerequisites: Business 203 and Business 301.

**306 Income Tax (4).** F A study of Federal income tax law and of tax cases to provide a basis for an understanding and evaluation of that law and of the rate structure. Includes the implications of income taxation for business decisions. Emphasis on taxation of individuals with limited coverage of partnerships and corporations. Prerequisite: Business 204.

**307 Advanced Taxation (4).** S. A study of Federal tax law and of tax cases as they apply to corporations, partnerships, estates, and trusts. This course will analyze and evaluate the Internal Revenue Code, the IRS Regulations, and appropriate case law as the basis for understanding the law, for utilizing the law in tax planning, and for ethically interpreting the law. Tax research will be emphasized. Prerequisite: Business 306.

**310 Advanced Accounting (4).** F Preparation of consolidated financial statements, introduction to governmental and fund accounting, business insolvency and reorganization, the role of FASB and the SEC in accounting. Prerequisites: Business 302.

**311 Auditing (4).** F The theory and philosophy of auditing, including an examination of the ethical and other professional standards required of the Certified Public Accountant. Prerequisite: Business 301 and Business 315.

**312 Not for Profit and Governmental Accounting (3).** F S. An introduction to the principles and practices of not-for profit and governmental and accounting that focuses on recording and reporting financial information with the unique standards applied to not-for-profit and government organizations. Topics include the preparation and evaluation of the financial reporting provided by state and local governments, educational institutions, health care organizations, mission organizations, churches, and other not-for-profit organizations. Topics of charitable giving and Christian services will be incorporated. Prerequisite: Business 204.

**315 Accounting Systems (4).** S. A study of accounting systems, which provides information for decision-making. The course examines business structures, information needed for decision-making, internal controls in manual and computerized systems, systems development, systems controls, and ethical aspects of the computer environment. Computerized accounting applications are incorporated using accounting software and spreadsheets. Prerequisites: Business 204.

**350 Law in Business (3).** F, S. An introduction to American business law: Origins, development, legal institutions, and processes. The legal environment of business, Uniform Commercial Code and case law of business

transactions, other topics selected from agency, property, partnership, corporation, regulatory, and administrative law.

**357 Business Aspects for Engineers (2).** F. An overview of the aspects of business important to engineering. Selected topics from economics, accounting, finance, marketing, management, and business law are included. Prerequisites: Economics 151 and junior or senior standing in the engineering program.

**358 Internship in Accounting (4, 8).** S. Off-campus accounting internships are available for qualified students. Internships may be either full-time or part-time. All interns will keep a reflective journal and submit periodic updates to the internship coordinator. Full-time interns will complete at least 350 hours of onsite experiential learning, as well as written assignments such as essays, integrative analyses, and a research paper on an approved accounting topic, receiving eight semester hours of credit. Part-time interns will complete at least 175 hours of on-site experiential learning as well as written assignments such as essays, an integrative analysis, and a research paper on an approved accounting topic, receiving four hours of credit. To be enrolled in an internship, the student must have junior or senior standing, must have a cumulative GPA of 3.0 or better, and must receive approval from both the department and the organization offering the internship. This course is an elective in the B.S. in Accountancy and the B.S. in Public Accountancy programs.

**359 Internship in Business (4).** F, S. Internships involve a minimum of ten to fifteen hours of work a week in a professional setting with an approved employer-supervisor in a business or nonprofit organization. Academic work involves readings, seminars/workshops, reflective journals, and a major paper/presentation. For business majors the internship must be in the student's area of business concentration in order to meet that concentration's requirements. Prerequisites: Business 160, Business 203 and approval of both the internship professor and the internship coordinator.

**360 Management and Organizational Behavior (3).** F, S. This course attempts to help students develop an integrated understanding of management based on God's revelation in creation and His Word. It develops this un-

derstanding through critical engagement with management perspectives of scholars and practitioners writing from both secular and Christian foundations. Prerequisites: Business 160 and Economics 151 or 221, biblical or theological foundations I, developing a Christian mind, philosophical foundations and a C or better in written rhetoric core.

**362 Ethics in Business (3)** F, S. Prepares students to be agents of Shalom in business organizations. Familiarizes business students with three key knowledge areas that are important for both doing business ethically and encouraging others to do likewise: current legal stipulations for business conduct, normative frameworks for evaluating actions or policies, and systems and techniques for promoting ethical behavior and overcoming rationalizations for misbehavior. Develops skills in evaluating the legal and ethical ramifications of actions or policies, and in persuasive argumentation in support of ethical actions or policies, through case studies. Hones virtues of honesty, courage, charity, creativity, empathy, humility, stewardship, compassion, justice, faith, hope, and wisdom, through reflective written exercises and case studies. Prerequisites: Business 360, Philosophy 153.

**363 Production and Operations Management (3).** S. A study of the management of production and operations within a business, including planning, control, and evaluation of resources, inventory, schedules, and product or service quality. Techniques for making location decisions, implementing just-in-time purchasing and production, scheduling production, and using statistical process control (SPC) are studied. Computer applications are occasionally integrated for analysis and simulation purposes. Prerequisites: Business 160 and Statistics 143 or its equivalent and junior level status.

**364 Global Supply Chain Management (3)** F. This course takes an integrative cross-functional approach to the study of supply chain management. Students will evaluate the challenges and opportunities involved in constructing a global network of organizations that cooperate synergistically to provide goods and services. Global business issues are discussed in the context of ethics and sustainability from a Reformed Christian perspective. Topical coverage includes cross-cultural considerations, strategy,

supply chain network design, sourcing, logistics, supply chain relationship management, demand forecasting, and performance evaluation. Prerequisites: Business 203, Information Systems 171, Statistics 143.

**365 Human Resource Management (3).** F, S. An introduction to human resource functions along with principles and issues involved in managing an organization's human capital. Emphasis is placed on the modern day importance of human resource management and focuses on the formulation and implementation of strategies that help companies achieve a sustained competitive advantage. Emphasis is also placed on respect, integrity and the inherent dignity of human beings and how business can create opportunities for individuals to express their vocation in the performance of God-glorifying work. The course will introduce a framework for integrated talent management and will include the study of talent acquisition, compensation and rewards management, organized labor, career succession, performance management, learning management and leadership development, employee engagement and retention, and redeployment. Prerequisite: Business 360.

**366 Advanced Topics in Human Resource Management (3).** F A consideration of psychological concepts and research related to human action in work situations, particularly in organizations. The principles of industrial and organizational psychology and human resource management are applied to current topics including organizational identity, psychometrics for screening and selection, employee socialization, performance measurement and management, and employee attitudes and behaviors. The relationship of psychological theory and practice are analyzed through case studies of organizational experiences. Also listed as Psychology 366. Prerequisites: Business 160 or Psychology 151 and Statistics 143 or Psychology 255.

**367 Small Business Management (3).** S. An integrative study of the business management principles applicable to the challenges and opportunities unique to small businesses. The course emphasizes strategic analysis of management, marketing and financial issues facing small firms primarily from an entrepreneurial perspective. This course includes lectures, case studies and development of a comprehensive business plan. Pre-

requisites: Business 370 and 380, Economics 222 or permission of the instructor.

**368 Entrepreneurship (3).** F. This course provides hands-on learning on how to launch a startup business through the rapid development and testing of ideas by gathering customer and marketplace feedback. Startups face uncertainty and high-levels of risk. Students learn how to reduce both uncertainty and risk by engaging actual customers in search of their pain points and unmet needs. Only by doing so can the entrepreneur develop a proper solution and establish a suitable business model. The class utilizes a lean start-up approach that provides the steps needed to build a successful startup. Students may work on for-profit, non-profit, and/or social ventures. Prerequisite: At least junior standing.

**370 Financial Principles (3).** F, S. A study of the principles and problems of the financial management of the firm, including such topics as stock and bond valuation, working capital management, cost of capital and capital budgeting, capital structure, and dividend policy. Prerequisites: Business 204, Economics 221, Statistics 143 and Information Systems 171.

**371 Financial Instruments and Markets (3).** F An application of finance theory to investment instruments, including stocks, bonds, options, and futures. The course also examines the financial markets and institutions in which these instruments trade, including investment companies, funds and exchanges. Prerequisite: Business 370.

**372 Advanced Corporate Finance (3)** S. The principles of finance are applied to current financial topics including analysis and forecasting of corporate performance, valuation, risk, the cost of capital, and strategic investment and financing decisions. Emphasis is placed on the development and use of financial spreadsheet programs, and business case problems. Prerequisite: Business 370.

**380 Marketing (3).** F, S. A study of the principles and strategies for planning and controlling marketing programs, including the market research, product development, pricing, promotion, and distribution of ideas, goods, services, experiences, and values that attempts to satisfy individual and organizational needs and objectives. Includes real-world learning projects. Prerequisite: Economics 221.

**381 Advanced Topics in Marketing** (3). F. A study of marketing theory, strategy and tactics. This course is research based and includes real-world learning projects. Prerequisites: Statistics 143 and Business 380.

**382 Consumer Behavior Theory and Practice** (3). F, S. An in-depth look at the processes involved when consumers purchase and use products, study of internal and external influences for purchase, and implications for marketing research and marketing strategy. Includes real-world learning research projects. Prerequisites: Business 380, Statistics 143 or equivalent.

**390 Independent Study**. F, I, and S. Prerequisite: Permission of the department chair.

**396 Strategic Management** (3). F, S. An integrative study of strategic management, requiring contemporary, comprehensive case applications of concepts from economics, marketing, accounting, finance, management, and international business. Ethical aspects of strategic decision making are emphasized. Student teams study cases and present their analyses. This course is recom-

mended for students wishing to understand the formulation and implementation of ethical strategies in diversified businesses. Prerequisites: Business 370 and 380, Economics 222 or permission of the instructor.

**397 Business Capstone** (3). F, S. Business organizations require their members to draw from broad experiences to address complex issues. In this course, teams of students work with a large or small business or a nonprofit organization, many with global stakeholders, to develop a detailed plan regarding an actual challenge or opportunity. This allows students to integrate and apply knowledge, skills and virtues drawn from their recent coursework. Students develop models of the organization and of the environment in which the organization operates so that the issue and solution are appropriately contextualized. Deliverables will include analysis reports, solution proposals, and implementation plans. Students reflect on how Christian beliefs and virtues affect their plans and affect their work in the project environment. Prerequisites: Business 360, 362, 370, 380 and 396. Business 362 can be taken concurrently with 397.

## Chemistry and Biochemistry

*Professors \*\*E. Arnoys, M. Barbachyn, L. Louters, M. Muyskens, K. Sinniah, D. Vander Griend (chair)*

*Associate Professors \*\*C. Anderson, \*D. Benson, C. Bruxvoort, H. Fyneweaver, C. Tatko*  
*Assistant Professors R. Baker, B. Looyenga*

The department offers courses and programs for students interested in a career as a chemist or biochemist, for those interested in pursuing post-baccalaureate education (e.g. graduate, medical, dental, or other professional training), and for those interested in teaching chemistry at the secondary level. A concentration in chemical engineering is offered through the Engineering Department. Students who are majoring in environmental science with a chemistry focus should consult the entry under environmental science for a description of this program.

Prerequisite to a program of concentration in chemistry or biochemistry is a minimum grade of C (2.0) in Chemistry 104, 201, and 253 or 261. The physical science core requirement may be met by Chemistry 101, 103, 104, 105 or 115. For general college students the preferred core course is Chemistry 101.

All students majoring in the department, with the exception of those in a secondary education program, must complete a capstone course during the senior year. Normally this course will be Interdisciplinary 310: History of Physical Science. Other options for the capstone course are possible but must be approved by the student's academic advisor.



## **CHEMISTRY MAJOR**

(36-37 semester hours)

Chemistry 103 and 104, or 105\*

Chemistry 201

Chemistry 230

Chemistry 253 or 261\*\*

Chemistry 304 or 317

Chemistry 303 or 323

One from Chemistry 262, 271, 318, 324, 325, 329, 330, or an approved interim

Interdisciplinary 310 or an approved course in integrative studies

Chemistry 295 (four times)

Completion of major field test

\* *Students who are well prepared for college chemistry are encouraged to enroll in Chemistry 105.*

\*\* *Students who enroll in Chemistry 261 must also enroll in Chemistry 262*

### **Cognates**

(16 semester hours)

One sequence from Mathematics 171 and 172, Mathematics 132 and Statistics 143, or Mathematics 171 and Statistics 143

Physics 221/222 or 133/235

## **CHEMISTRY MINOR**

(6 courses, 24-26 semester hours)

Chemistry 103 and 104, or 105\*

Four or five from Chemistry 201, 230, 253, 261, 262, 271, 303, 304, 317, 318, 323, 324, 329, or an approved interim. At least one must be a 300-level course.

## **CHEMISTRY MAJOR (ACS Certified)**

(45-50 semester hours)

This major meets the certification requirements of the American Chemical Society and best prepares students for graduate study in chemistry and related areas:

Chemistry 103 and 104, or 105\*

Chemistry 201

Chemistry 230

Chemistry 253 or 261\*\*

Chemistry 304 or 317

Chemistry 303 or 323

Chemistry 383

Chemistry 395 (4 semester hours, the last as honors) or 397 with a seminar presentation

Three with at least one from each category or an approved interim

Category I – Chemistry 262, 324, 325, 330

Category II – Chemistry 271, 318, 329, Engineering 331

Interdisciplinary 310 or an approved course in integrative studies

Chemistry 295 (four times)

Completion of major field test

### **Cognates**

(16 semester hours)

Mathematics 171/172

Physics 133/235 or 221/222

## **SECONDARY EDUCATION**

### **CHEMISTRY MAJOR**

(32 semester hours)

Chemistry 103 and 104, or 105\*

Chemistry 201

Chemistry 253 (recommended) or 261\*\*

Chemistry 304 (recommended) or 317

Chemistry 303 (recommended) or 323

One from Chemistry 230, 262, 271, 318, 324, 325, 329

Science Education Studies 359

Chemistry 295 (three times)

Completion of major field test

### **Cognates**

(15 semester hours)

Mathematics 132 or 171

Physics 133 and 235 or Physics 221 and 222

Science Education Studies 214

## **SECONDARY EDUCATION**

### **CHEMISTRY MINOR**

(25 semester hours)

Chemistry 103 and 104, or 105\*

Chemistry 201

Chemistry 253 (recommended) or 261

Chemistry 304 (recommended) or 317

Chemistry 303 (recommended) or 323

Chemistry 295 (two times)

### **Cognates**

(11 semester hours)

Science Education Studies 214

Two from Math 171 (or 132), 172, Statistics 143, Physics 221, 132 or 133

## **ELEMENTARY AND SECONDARY INTEGRATED SCIENCE STUDIES**

Students in the elementary or secondary education program wishing to major or minor in science should refer to the science education section of the catalog.

## BIOCHEMISTRY MAJOR

(37-38 semester hours)

Chemistry 103 and 104, or 105\*

Chemistry 253 or 261\*\*

Chemistry 323 and 324

Chemistry 383

Three from Chemistry 201, 230, 262, 271, 304, 317, 318, 325, 329, 330, Engineering 331, Biology 321, 325, 331-336, or an approved interim. Only one of these may be a biology course.

Interdisciplinary 310 or an approved course in integrative studies

Chemistry 295 (four times)

Completion of major field test

### Cognates

(20 semester hours)

One sequence from Mathematics 132 and Statistics 143 or 145, Mathematics 171 and 172, or Mathematics 171 and Statistics 143 or 145

Physics 221/222 or 133/235

Biology 141 or 161 (prerequisites may be required)

## BIOCHEMISTRY MINOR

(6 courses, 21-26 semester hours)

Chemistry 103 and 104, or 105\*

Chemistry 253 or 261\*\*

Chemistry 323 and 324

One or two from chemistry 201, 230, 262, 271, 304, 317, or an approved interim

## BIOCHEMISTRY MAJOR (ACS Certified)

(45-50 semester hours)

This major meets the certification requirements of the American Chemical Society and best prepares students for graduate study in biochemistry and related areas:

Chemistry 103 and 104, or 105\*

Chemistry 201

Chemistry 230

Chemistry 253 or 261\*\*

Chemistry 304 or 317

Chemistry 323 and 324

Chemistry 383

Two from Chemistry 262, 271, 318, 325, 329, 330, Engineering 331, Biology 321, 325, 335, 336, or an approved interim. Only one of these may be a biology course.

Chemistry 395 (4 semester hours, the last as honors) or 397 with a seminar presentation.

Interdisciplinary 310 or an approved course in integrative studies

Chemistry 295 (four times)

Completion of major field test

Cognates

(20 semester hours)

Mathematics 171/172

Physics 133/235 or 221/222

Biology 141 or 161 (prerequisites may be required)

\* *Students who are well prepared for college chemistry are encouraged to enroll in Chemistry 105.*

\*\* *Students who enroll in Chemistry 261 must also enroll in Chemistry 262*

## Degree tracks

Our degree programs are designed to provide breadth of instruction in the foundations of chemistry while allowing flexibility for students to pursue, in depth, specific areas of interest at the advanced level. Students are encouraged to select elective courses, in consultation with an academic advisor that will prepare them well for future employment or education. For example, the following combinations of electives for various career tracks may be considered:

Forensics: Chemistry 253, 304, 323/324, 329, and 383, Biology 325

Synthesis: Chemistry 261/262, 317/318, 325, and 330

Materials: Chemistry 261/262, 317/318, 329, and 330, Mathematics 321,

Physics 133/235

Environmental Chemistry: 261/262, 271, 329, Environmental Studies 210

Food Science: Chemistry 323/324 and 329, Biology 207 or 336, Statistics 143, Health 254

Pre-medicine: Chemistry 304, 323/324, Biology 321, 325, or 336

Chemical or Medical Technology: Chemistry 303, 383, and 329, Biology 325

## GROUP SCIENCE MAJORS

A group major in science and mathematics meets the needs of some students, particularly those in professional programs. These majors are not normally appropriate for students who anticipate attending graduate school and cannot be taken by students in teacher education

programs. Such group majors require twelve courses in the sciences and mathematics, ten of which must be from two departments with no fewer than four from either, with the remaining two courses chosen from a third department. At least two 300-level courses in one discipline must be included in the ten-course component of this group. The chairs of the three departments involved must approve each program of this type.

### Honors program

The department sponsors an honors program to supplement the formal course offerings in the department's degree programs, increase both the breadth and depth of the student's knowledge of modern chemistry, and lead to an honors degree in chemistry or biochemistry upon graduation. The program offers guided study in chemistry through tutorials, independent research, and special honors courses such as Chemistry 104H, Chemistry 261H, and Chemistry 395H.

The requirements for graduation with honors in chemistry or biochemistry are: (1) completion of a major in chemistry or biochemistry with at least a 3.5 cumulative grade point average, (2) six honors courses (18 hours minimum) overall: three honors courses must be outside of the major, only one may be a cognate. The other three honors courses must be within the major where one must be a research course (see next requirement) and only one may be a 100-level course. (3) completion of at least 4 semester hours of research (Chemistry 395/397), the last of which must be designated an honors course, which requires a formal report (reviewed by a committee) and a presentation in the departmental seminar series.

## COURSES (CHEM)

### General College Courses

These introductory courses satisfy the Physical World core requirement. Non-science majors are encouraged to enroll in Chemistry 101 or 115. Science majors must enroll in Chemistry 103 and 104, or 105. Students having a strong chemistry background are encouraged to enroll in Chemistry 105.

**101 The Molecular World** (4). S. This is a general course designed for the non-science major and the elementary education student.

The course explores the role of chemistry and its resulting technologies in the environment and contemporary society. It emphasizes the nature of scientific investigation, some historical developments in chemical theory, chemical periodicity and reactivity, and our daily interaction with synthetic materials and chemicals. The course is taught from a biblical worldview and addresses issues such as the validity and limitations of scientific knowledge, human responsibility in applying such knowledge in society, and the care and stewardship of natural resources. Laboratory.

**103 General Chemistry I** (4). F. This course is a study of the basic principles of chemistry, with emphasis on the laws of chemical combination, descriptive inorganic chemistry, thermochemistry, the gas, liquid, and solid states of matter, the periodic law, atomic structure and chemical bonding, and the nature of intermolecular forces. The course is taught from a biblical and reformed worldview and addresses issues such as the validity and limitations of scientific knowledge, the methodology of the physical sciences, human responsibility in applying such knowledge in society, and the care and stewardship of natural resources. Laboratory. Prerequisite: One year of high-school chemistry or permission of the instructor. Note: Successful completion of the Chemistry 103-104 sequence meets the requirements for both science core categories.

**104 General Chemistry II** (4). S. A continuation of chemistry 103 with emphasis on kinetics, chemical equilibria involving gases, weak acids and bases, and slightly soluble solids, free energy changes, electrochemistry, transition metal chemistry, descriptive chemistry, and nuclear chemistry. Laboratory. Prerequisite: Chemistry 103 with a grade of C or better, or the equivalent.

**105 Chemical Principles** (4). F. A one-semester study of the basic principles of chemistry, this course is an alternative to the Chem103/104 sequence for students who plan to major in science and have a strong background in chemistry and mathematics. This course covers all of general chemistry in a single semester by focusing on the phaseology, chemical structure, energetics, and kinetics of chemical reactions. Additional topics include acid/base chemistry, electro-

chemistry, and nuclear chemistry. The final exam for this course is equivalent to that for Chem104. Laboratory. Prerequisites: a strong background in high school chemistry and/or an AP chemistry score of 4/5.

**115 Chemistry for the Health Sciences** (4). F, S. This course is specifically designed for those planning for a health care career such as Nursing or other allied health careers that require a chemistry course. The fundamental concepts of general chemistry, organic chemistry, and biochemistry are presented with an emphasis on the chemical nature of biological systems. Topics such as molecular bonding and structure, equilibrium chemistry, and chemical reactivity as illustrated by acid/base reactions and redox reactions are presented in a biological context such as membranes, enzymes, buffers, and cellular energy metabolism. Issues regarding the ethics and stewardship of health also will be discussed. Laboratory. Prerequisite: high school chemistry.

#### Foundational Courses

These courses provide foundational instruction in the sub-disciplines of chemistry.

**201 Analytical Chemistry** (4). F. Features a problem-solving approach that incorporates sampling, sample preparation, separation of analytes from interfering substances, measurement and data analysis interpretation. Quantitative analysis is presented in the context of analytical methods that include statistics of sample measurements (significance tests, outlier tests, linear regression), separation science (gas, liquid, ion chromatography, and capillary electrophoresis), optical spectroscopy (uv-visible, fluorescence, and atomic absorption spectroscopy), and electrochemistry (electrode potentials, ion-selective electrodes, and sensors). The laboratory includes project(s) related to quantitative chemical analysis. Laboratory. Prerequisite: Chemistry 104 or 105 with a grade of C or approval of the instructor. Not open to seniors except by permission.

**230 Essential Inorganic Chemistry** (4). S. This foundational course for 1st and 2nd year students covers the properties and trends of molecules derived from across the periodic table, with special emphasis on the main group elements. Topics covered include periodicity, bonding, symmetry, and reactivity. Special at-

tion will be given to visualization tools for molecular structures. Upon completion of the course, students will be prepared to critically compare and contrast molecular and biomolecular structures with chemical reactions presented in subsequent course work throughout the science division. No laboratory requirement. Prerequisite: Chemistry 104 or 105 with a grade of C or better, or approval of the instructor (can also be taken concurrently).

**253 Fundamentals of Organic Chemistry** (5). F. A study of organic compounds, reactions, and reaction mechanisms, emphasizing their biochemical significance. Laboratory. Prerequisite: Chemistry 104 or 105 with a grade of C or better, or approval of the instructor.

**261 Organic Chemistry I** (5). F, SS. A detailed study of organic compounds, their synthesis and reactions, presented within the framework of modern physico-chemical theory, together with an introduction to modern methods of analysis and identification. Majors and minors enrolling in this course must also take Chemistry 262. Laboratory. Prerequisite: Chemistry 104 or 105 with a grade of C or better, or approval of the instructor.

**303 Fundamentals of Biochemistry** (4). S. A survey of biochemistry focusing on the structure and function of proteins, carbohydrates, lipids, and nucleic acids. Fundamentals of metabolism and regulation will be presented in the context of exercise science—that is, how the body biochemically supports the energy demands of exercise. This course is not primarily intended for students who wish to major or minor in chemistry or biochemistry, but it may substitute for Chemistry 323 in all programs. The lab component of this course is Chemistry 383. Prerequisite: Chemistry 253 or 262.

**304 Physical Chemistry for the Biological Sciences** (4). S, alternate years. A survey of physical chemistry with emphasis on the laws of thermodynamics, physical equilibria, transport phenomena, and enzyme kinetics. Topics are treated with life science applications. Laboratory. Prerequisites: Chemistry 104 or 105, and 201, a one-semester college level calculus course. Not offered 2015–2016.

**317 Physical Chemistry I** (4). F. A study of macroscopic properties of matter as described by chemical thermodynamics and

kinetics. Major topics include: The laws of thermodynamics and their application to pure substances, chemical reactions, solutions, and physical and chemical equilibria, and reaction kinetics. Laboratory. Prerequisites: Chemistry 104 or 105, and 201, Mathematics 172, and a college physics course.

**323 Biochemistry I (4).** F. A study of proteins, enzymes, carbohydrates, lipids, and membranes with an emphasis on the relationship of structure and function. Also included is the study of metabolism with primary focus on glycolysis, gluconeogenesis, glycogen metabolism, Krebs cycle, and oxidative phosphorylation. Prerequisite: Chemistry 253 or 262.

### Advanced Courses

These courses build on prerequisite foundational course work, integrating and investigating foundational concepts more thoroughly.

**262 Organic Chemistry II (5).** S, SS. A continuation of Chemistry 261. Laboratory. Prerequisite: Chemistry 261 with a grade of C or better, or approval of the instructor.

**271 Environmental Chemistry (4).** S, alternate years. A study of the chemistry of the atmosphere, natural water, and soils, with a special focus on environmental problems arising from the activities of humans, including a study of acid precipitation, greenhouse gases, ozone depletion, urban and indoor air pollution, water and soil pollution, solid and hazardous waste disposal, and risk assessment all presented within the context of a Christian view of humans and nature. Laboratory. Prerequisite: Chemistry 253 or 261.

**318 Physical Chemistry II (4).** S, alternate years. A study of the microscopic domain of matter in terms of quantum mechanics and statistical mechanics. Major topics include: the structure, energy, and spectroscopy of atoms and molecules given by quantum theory, and the relationship between microscopic and macroscopic properties of matter (statistical mechanics). Laboratory includes a six-week project on a topic proposed by the instructor. Prerequisite: Chemistry 317.

**324 Biochemistry II (4).** S. A continuation of chemistry 323. Topics covered are lipid metabolism, photosynthesis, biosynthesis of macromolecular precursors, the chemistry of the

storage, transmission and expression of genetic information, biochemical dimensions of selected physiological processes, and philosophical and ethical issues related to biochemistry. Prerequisite: Chemistry 323 or 303.

**325 Advanced Organic Chemistry (4).** S, alternate years. A study of selected topics in organic synthesis or physical organic chemistry. In the laboratory individual projects involving multi-step syntheses are carried out based upon procedures found in the literature. All compounds prepared are characterized using spectroscopic methods and other instrumental techniques. Prerequisite: Chemistry 262.

**329 Instrumental Methods for Chemical and Biological Sciences (4).** S. The aim of this course is to expose students to several instrumental techniques in chemistry, biochemistry, and biotechnology. The course will cover the principles underlying common instrumental spectroscopic techniques. A combination of lecture and laboratory will cover a number of instrumental techniques. In lab, students will examine how instruments work and their performance characteristics. Several weeks of the laboratory session will be devoted to an independent project which will use a minimum of two instruments. Laboratory. Prerequisite: Chemistry 201. Not offered 2015–2016.

**330 Advanced Inorganic Chemistry (4).** F, alternate years. A fundamental study of the chemistry of all elements with emphases on periodicity, symmetry, bonding, and reactivity. Types of compounds discussed include ionic solids, cage compounds, organometallic compounds, coordination compounds, and bioinorganic compounds. Electronic and magnetic characteristics are studied in depth. A significant component of the course involves studying advances in inorganic chemistry from peer-reviewed literature. Laboratory. Not offered 2015–2016.

**383 Laboratory in Biochemistry (1).** F, S. A laboratory course designed to teach students modern biochemical separation and analytical techniques. Included in this course are the following topics: affinity, chromatography, agarose gel and polyacrylamide gel electrophoresis, polymerase chain reaction, ultraviolet/visible spectroscopy, enzyme kinetics, and recombinant DNA techniques. Students will be required

to carry out individual projects involving the purification and analysis of a biological macromolecule from cells or tissue. Pre or co-requisites: Chemistry 303 or 323.

**390 Independent Study** F, I, and S. Directed readings or projects. Admission by permission of the chair and instructor under whom the work will be done.

### Seminars, Capstone, and Research Courses

**295 Chemistry Seminar** F and S, no credit. A seminar devoted to an exploration of topics in current chemical research in both academic and industrial laboratories. Junior and senior chemistry majors must attend each semester, freshmen and sophomores intending to major in chemistry are encouraged to attend.

**395 Academic Year Research** (0-4) F, I, and S. Research on a project selected in consultation with a faculty member at Calvin College. Each credit requires 45 hours of research. This course may be taken more than once. A student may be paid for research if and only if it is taken for zero credit. The student will be required to write a report and complete all tasks specified by the supervisor. If taken as honors, a seminar in Chemistry 295 must be given and a formal research report must be written and approved by a review committee. To be enrolled in this course, the student must submit a completed research agreement form to the office of academic services and the science division office.

**397 Summer Research** (0) F and S, summer research for a minimum of 10 weeks full time on a project selected in consultation with a faculty member at Calvin College. This course constitutes 3 semester hours of research and may be taken more than once. A formal research report must be written each time. If the project is to be conducted off campus, prior approval by the chair is required. Register for the course for the fall semester directly following the summer in which the research was conducted, unless a seminar is to be given the next spring. To be enrolled in this course, the student must submit a completed research agreement form to the office of academic services and the science division office.

**397H Summer Research** (1) F and S, summer research for a minimum of 10 weeks full

time on a project selected in consultation with a faculty member at Calvin College. This course constitutes 3 semester hours of research. A formal research report must be written and approved by a review committee, and a seminar in Chemistry 295 must be given. If the project is to be conducted off campus, prior approval by the chair is required. Register for the course for the fall semester directly following the summer in which the research was conducted, unless a seminar is to be given the next spring, to be enrolled in this course, the student must submit a completed research agreement form to the office of academic services and the science division office.

**IDIS 310 History of Physical Science** (3). S. Integrative Studies/ Capstone. An examination of natural philosophy in the 17th century and of major developments since then in the physical sciences (predominantly physics and chemistry). Particular attention is given to the philosophical and religious background of scientific ideas and the institutional context in which science develops. A central theme of this capstone course will be the investigation of the interaction of science and religion with a view toward articulating a critical reformed Christian perspective on this historical development. Some primary texts will be considered. Prerequisites: developing a Christian mind, History 151 or 152, Philosophy 153, Religion 121 or 131, junior or senior standing, and a declared major in the natural sciences, or approval of the instructor.

### Off-Campus Courses

**332 Environmental Chemistry.** Principles and analysis of chemical movement and distribution in natural environments. Sampling and analytical methods are included for water, soil, and air. Work conducted both in natural habitats and the laboratory. Prerequisites: One year of general chemistry and one semester of either biochemistry or organic chemistry. Offered in conjunction with the AuSable Institute.

**385 Internship in Chemistry** (3, 4). F, S. Off-campus chemistry internships can be arranged for qualified students. Students work 10-12 (3 semester hours) or 13-15 (4 semester hours) hours per week throughout the semester under the supervision of an off-campus employer-supervisor and a faculty internship coordinator. Interns will meet with

their faculty coordinator bi-weekly, keep a reflective journal, and submit a final written paper summarizing their internship experience. The off-campus supervisor will send in an evaluation report on the work of the intern. To be enrolled in an internship, the student must have junior or senior standing, must have a cumulative GPA of 2.0 or better, an av-

erage GPA of 2.0 or better in all science and Mathematics courses, completed the second semester of organic chemistry (Chemistry 262) or equivalent, and approval from both the department and the off-campus employer. To be enrolled in this course, the student must submit a completed research agreement form to the office of academic services.

## Chinese

Associate Professors L. Herzberg, \*\*C. Roberts (chair)

The Chinese language program is part of the Asian studies program and is administered by the Germanic and Asian Languages Department. The Chinese language major includes eight Chinese language courses and four culture courses.

There are two possible minors available, namely the Chinese language minor and the Chinese study group minor.

Students can fulfill the foreign language core requirement with the completion of Chinese 202.

During fall semester of each year, Calvin offers its own full-time Chinese language and history program in Beijing, China at Capital Normal University (STCH). The program in Beijing is for students with or without prior knowledge of Chinese. The advisor for the program is L. Herzberg of the Germanic and Asian Languages Department.

### CHINESE LANGUAGE MAJOR

(42 semester hours)

One from History 245, 246, 346, or STCH 204

Philosophy 225, or STCH 203

One from Religion 255, 355, or 356

Eight Chinese language courses

One culture elective from Art History 241, History 245, 246, 346, 371, Political Science 277, Religion 354, 355, 356, STCH 203, 204, 210, or Beijing courses (at least one must be taken at the 300-level)

### CHINESE LANGUAGE MINOR

(27 semester hours)

Chinese 101

Chinese 102

Chinese 201

Chinese 202

Chinese 301

Chinese 302

Chinese 311 or 312

### CHINESE STUDY GROUP MINOR

(25 semester hours)

Chinese 101

Chinese 102

Chinese 201

Chinese 202

Three from Art 241, History 245, 246, 346, 371, STCH 210, Philosophy 225, Political Science 277, Religion 255, 355, or any one interim course on China including a Calvin-approved interim trip to China.

### CHINESE ELEMENTARY OR SECONDARY EDUCATION MAJOR

(39-42 semester hours)

Chinese 101

Chinese 102

Chinese 201

Chinese 202

Chinese 301

Chinese 302

Chinese 311

Chinese 312

STCH 203 or advisor approved \*HIST 245

STCH 204 or advisor approved \*HIST 346

IDIS 356 or 357

IDIS 359 (secondary education only)

\* Students who have lived in China for at least one year may seek advisor approval for the on-campus history alternate to a semester in China (STCH).

### CHINESE K-12 EDUCATION MAJOR (42-45 semester hours)

Chinese 101  
 Chinese 102  
 Chinese 201  
 Chinese 202  
 Chinese 301  
 Chinese 302  
 Chinese 311  
 Chinese 312  
 STCH 203 or advisor approved \*HIST 245  
 STCH 204 or advisor approved \*HIST 346  
 IDIS 356  
 IDIS 357  
 IDIS 359 (secondary education only)

\* *Students who have lived in China for at least one year may seek advisor approval for the on-campus history alternate to a semester in China (STCH).*

### CHINESE ELEMENTARY OR SECONDARY EDUCATION MINOR (30 semester hours)

Chinese 101  
 Chinese 102  
 Chinese 201  
 Chinese 202  
 Chinese 301  
 Chinese 302  
 Chinese 311 or 312  
 IDIS 356 or 357

### COURSES (CHIN)

101 **Elementary Chinese I** (4). F. An introduction to Chinese language and culture, stressing both spoken and written Chinese. After one-semester students will be able to carry on simple conversations in (Mandarin) Chinese, read dialogues written in Chinese, and understand some fundamentals of Chinese social values and ways of thinking. Approximately 300 Chinese characters will be introduced.

102 **Elementary Chinese II** (4). S. A continuation of Chinese 101. Continued study of Chinese grammar, with equal emphasis on improving conversational proficiency and on reading and writing Chinese. Another 300 Chinese Characters will be introduced for reading and writing and as a medium for gaining insight into Chinese culture. Prerequisite: Chinese 101 or permission of the instructor.

201 **Intermediate Chinese I** (4). F. A continuation of Chinese 101. Continued study of Chinese grammar, with equal emphasis on improving conversational proficiency and on reading and writing Chinese. Another 300 Chinese Characters will be introduced for reading and writing and as a medium for gaining insight into Chinese culture. Prerequisite: Chinese 102 or permission of the instructor.

202 **Intermediate Chinese II** (4). S. A continuation of Chinese 201. Completion of the study of basic Chinese grammar and further study of the Chinese writing system, with continued emphasis on both speaking and reading. Two hundred more Characters are taught for reading comprehension and cultural understanding. Completion of this course satisfies the core foreign language requirement. Prerequisite: Chinese 201 or permission of the instructor.

301 **Advanced Chinese Language I** (4). F. This course is designed to develop advanced aural comprehension skills as well as advanced competence in spoken Chinese through exercises, drills, and conversation in class. Students will also continue their study of the written language by reading extended dialogues on various topics in class as well as doing a large number of written assignments, including short essays on aspects of daily life. Prerequisite: Chinese 202 or permission of the instructor.

302 **Advanced Chinese Language II** (4). S. A continuation of the work in Chinese 301, students complete a systematic study of advanced grammar and composition. Students will learn many new Chinese characters as they improve their skills in written Chinese. Conversation practice will also be emphasized. Prerequisite: Chinese 301 or permission of the instructor.

311 **Readings on Chinese Society and Culture** (3). F. A continuation of advanced Chinese language study using selected readings in Chinese on Chinese history, society, and culture. Conversation practice in Chinese will continue to be emphasized. Prerequisite: Chinese 302 or permission of the instructor.

312 **Further Readings on Chinese Society and Culture** (3). S. This course builds on Chinese 311 and includes further language study and selected readings on Chinese history, society, and culture. Conversation practice in Chinese will continue to be emphasized. Prerequisite: Chinese 311 or permission of the instructor.



# Classics

Professor \*M. Williams

Associate Professors Y. Kim (chair), D. Noe, J. Winkle

The Classics Department offers four programs of concentration in classical studies, classical languages, Greek language, and Latin language. The program in classical studies combines courses from several disciplines in a broad study of Greco-Roman civilization and its later influence. The classical languages program is designed for graduate studies; the Greek language program is for pre-seminarians and for any others wishing to concentrate in Greek language and literature; and the Latin language program is for those intending to teach the language at the secondary school level and for any others wishing to concentrate in Latin language and literature.

Courses not normally scheduled may be offered to qualified students on an individual basis so that specific concentrations may be completed.

## CLASSICAL STUDIES MAJOR

(30-35 semester hours)

Classics 211

Classics 221

Classics 231

History 261

Philosophy 251

Two from History 262, 263, 264 or 362

Four from Art History 101, 233, 235,

Communication Arts and Sciences 320,

Philosophy 312, Religion 241, 341, or

any course in Greek or Latin (students

who complete two courses in Greek

or two courses in Latin need only one

more elective from this list).

## CLASSICAL STUDIES MINOR

(18-24 semester hours)

Classics 211

Classics 221

Classics 231

History 261

Three from History 262, 263, 264, 362,

Philosophy 251, or any course in

Greek or Latin (students who complete

two courses in Greek or two courses

in Latin need no more electives from

this list).

## CLASSICAL LANGUAGES MAJOR

(48 semester hours)

Six from Greek 101, 102, 201, 203, 205,  
206, Latin 101, 102, 122, or 201

Six from Greek 302, 307, 395, Latin 205,  
206, 300, 302, 304, 305, or 391 (at  
least one 300-level course must be  
taken in each language)

Two from Classics 211, 221, 231, History  
261, or one approved Interim course

## GREEK MAJOR

(28-30 semester hours)

Six from Greek 101, 102, 201, 203,

205, 206, 302, 307, 395 (at least one

300-level Greek course must be taken)

Two from Classics 211, 221, 231, History

261, or additional Greek courses

## GREEK MINOR

(22-23 semester hours)

Five from Greek 101, 102, 201, 203, 205,

206, 302, 307, or 395

One from Classics 211, 221, or 231

## LATIN MAJOR

(27-30 semester hours)

Six from Latin 101, 102, 122, 201, 205,

206, 300, 302, 304, 305, or 391 (at

least one 300-level Latin course must  
be taken)

Three from Classics 211, 221, 231, His-

tory 261, or additional Latin courses

## LATIN MINOR

(18-21 semester hours)

Five from Latin 101, 102, 122, 201, 205,

206, 300, 302, 304, 305, or 391

One from Classics 211, 221, or 231

## LATIN SECONDARY EDUCATION MAJOR

(30 semester hours)

Latin 205

Latin 206

Latin 300

Latin 302

Latin 304

Latin 305

Two from Classics 211, 221, 231, or  
History 261  
Interdisciplinary 357  
Interdisciplinary 359

### LATIN SECONDARY EDUCATION MINOR

(21 semester hours)

Latin 205

Latin 206

Three from Latin 300, 302, 304, or 305

One from Classics 211, 221, 231, or His-  
tory 261

Interdisciplinary 357

Students who have completed one year of high school Latin should normally enroll in Latin 101, those with two or more years in Latin 201. Students whose qualifications permit them to omit Latin 201 should consult the department chair regarding special major or minor programs. Those who have completed one year of college Latin should normally enroll in Latin 201. Qualified students can complete the college core requirement in foreign language by taking Latin 101, 122, and 205/206 in one academic year.

Completion of Latin 205/206, Greek 205/302 or their equivalents satisfies the core requirement in foreign language. Classics 221 or 231 can satisfy the core requirement in the arts. Classics 211, Greek 302, 307, Latin 300, 302, 304, or 305 can satisfy the core requirement in literature.

## COURSES

### Classics (CLAS)

211 **Classical Literature** (3). F, S. This is a study of the major works of Greek and Roman literature from Homer to Augustine. The course devotes attention to the origins and development of Greek epic, lyric, drama, and historiography, and to their transformation in the literature of Rome and the church fathers. Artistic and archaeological evidence supplements the study of the texts. This course can satisfy the core requirement in literature.

221 **Classical Art and Architecture** (3). S. This is a study of the major arts of ancient Greek and Roman civilization from the Bronze Age to the late Empire. The course devotes attention to the origins and development of Greek sculpture, painting, and archi-

tecture, and to their transformation in the arts of Rome. Ancient literary sources supplement the study of material culture in this investigation of Greek and Roman culture. This course can satisfy the core requirement in the arts.

231 **Classical Mythology** (3). F, S. This is a study of the major themes in classical mythology via the literature and art of Greece and Rome. The course includes a study of major literary sources in translation and major art works of both cultures, with special attention to various interpretations of the myths and the works of art they have influenced in the development of Western culture. This course can satisfy the core requirement in the arts.

### Greek (GREE)

101 **Elementary Greek I** (4). F, A beginning study of classical Greek with emphasis on the essentials of grammar and basic vocabulary.

102 **Elementary Greek II** (4). S. A continuation of Greek 101 with the reading of selected prose passages. Completion of this course allows the student to read works like the New Testament or Attic Greek prose with the help of a grammar and lexicon.

201 **Greek Philosophers** (4). F, alternate years. Readings in Plato or Aristotle, with special emphasis on gaining reading proficiency in Greek prose. Prerequisite: Greek 102.

203 **Greek Historians** (4). F, alternate years. Readings in Herodotus or Thucydides, with special emphasis on gaining reading proficiency in Greek prose and some attention to the differences among the major Greek historians. Prerequisite: Greek 102.

205 **New Testament Greek: Gospels** (4). F. Readings in one of the New Testament gospels with some attention to the parallel passages in the other gospels and careful study of the special features of koine Greek. The course emphasizes the significance of lexical and syntactical detail for the interpretation of the text. Prerequisite: Greek 102.

206 **New Testament Greek: Epistles** (4). S. Readings in some of Paul's epistles, with special emphasis on gaining reading proficiency in koine Greek. Prerequisite: Greek 205. Completion of this course can fulfill the core requirement in foreign language.

**302 Greek Epic** (3). S, alternate years. Readings in Homer's *Iliad* or *Odyssey*, with special emphasis on gaining reading proficiency in Greek poetry and understanding the literary qualities of Greek epic, as illumined by critical scholarship. This course can satisfy the core requirement in literature. Prerequisite: at least three semesters of Greek.

**307 Greek Tragedy** (3). S, alternate years. A close reading of at least one Greek tragedy with special emphasis on its literary qualities, as illumined by critical scholarship. This course can satisfy the core requirement in literature. Prerequisite: at least three semesters of Greek.

**395 Special Topics in Ancient Greek** (3). Independent study of special topics or authors not ordinarily covered in the rest of the Greek curriculum. Offered as needed. May be repeated provided the course content is different. Prerequisite: at least four courses in Greek.

### Latin (LATN)

**101 Elementary Latin I** (4). F For students who have had only one year of high school Latin or no Latin at all. The course emphasizes the essentials of grammar and a basic vocabulary with constant comparison to English. Sententiae from the principal Latin authors will be read.

**102 Elementary Latin II** (4). S. A continuation of Latin 101. The course emphasizes grammar and the reading of longer selections of authentic Latin dealing with Roman history and culture. Prerequisite: Latin 101 or its equivalent.

**122 Elementary Latin II: Intensive** (4). I. An intensive version of Latin 102, taught during the interim term, continuing from Latin 101 and leading to Latin 205/206. A continuing study of Latin grammar and reading of selections from Latin texts. Prerequisite: Latin 101 or its equivalent.

**201 Intermediate Latin I** (4). F A thorough review of the essentials of grammar will accompany the reading of selected Latin prose and/or poetry. Prerequisite: two years of high school Latin or two courses of college Latin.

**205 Latin Prose Survey** (3). S, alternate years. Readings in Roman authors selected

to survey the development of classical Latin prose, to build proficiency in reading, and to serve as an introduction to the advanced genre courses. Completion of this course can fulfill the core requirement in foreign language. Prerequisite: Latin 201, three years of high school Latin, or permission of the instructor.

**206 Latin Poetry Survey** (3). S, alternate years. Readings in Roman authors selected to survey the development of Latin poetry, to build proficiency in reading, and to serve as an introduction to the advanced genre courses. This course can satisfy the core requirement in foreign language. Prerequisite: Latin 201, three years of high school Latin, or permission of the instructor.

**300 Latin Epic** (3). F, alternate years. Readings from Vergil's *Aeneid* or other works of Roman epic with special emphasis on their literary qualities, as illumined by critical scholarship. This course can satisfy the core requirement in literature. Prerequisite: Latin 205 or 206.

**302 Roman Philosophers** (3). S, alternate years. Readings from such authors as Lucretius, Cicero, Seneca, or Augustine, with special emphasis on their literary qualities, as illumined by critical scholarship. This course can satisfy the core requirement in literature. Prerequisite: Latin 205 or 206.

**304 Roman Historians** (3). F, alternate years. Readings from such authors as Caesar, Sallust, Livy, or Tacitus, with special emphasis on their literary qualities, as illumined by critical scholarship. This course can satisfy the core requirement in literature. Prerequisite: Latin 205 or 206.

**305 Latin Lyric Poetry** (3). S, alternate years. Readings from such authors as Vergil, Catullus, Horace, and the elegiac poets, with special emphasis on their literary qualities, as illumined by critical scholarship. This course can satisfy the core requirement in Literature. Prerequisite: Latin 205 or 206.

**391 Special Topics in Latin** (3). Independent study of special topics. Offered as needed. May be repeated provided the course content is different. Prerequisite: at least two 300-level courses in Latin or permission of the instructor.

# Communication Arts and Sciences

Professors D. Freeberg, K. Groenendyk (chair), G. Pauley, C. Plantinga, W. Romanowski, S. Sandberg

Associate Professors D. Leugs, (Director of Theatre), C. Smit, S. Wieland

Assistant Professors G. Heetebrij, S. Smartt

The Communication Arts and Sciences (CAS) Department serves students intending careers in communication-related professions and those who wish to understand the society in which they live and to improve their ability to communicate. The department offers majors in film and media, strategic communication, and theatre. The department also offers group majors in organizational communication and digital communication. Students with a GPA of 2.5 and above are encouraged to do an internship, either locally with CAS 346 or with the Chicago Semester, the American Studies Program in Washington, D.C., or the Los Angeles Film Studies Center. The department's internship advisor is S. Wieland.

The group minor in journalism, a program involving the department, is described under the English Department.

The core requirement in rhetoric in culture may be met by CAS 101, 140, 141, 180, or 214. The department offers an exemption exam for CAS 101. Passing the exam constitutes completion of the rhetoric in culture core.

**Speech Pathology and Audiology** is listed separately, starting on page 262.

## DIGITAL COMMUNICATION

### GROUP MAJOR

(32-33 semester hours)

CAS 141 or CAS 145

CAS 180 or CAS 190

CAS 201

CAS 230

One from CAS 248, CAS 249, CAS 285 or CAS 290

CAS 346 or CS 394

CAS 399 or CS 384

CS 100

CS 106 or CS 108

One sequence from CS 112 and 262 or IS 141, 271, and 341

IS 337

### Cognates

(9 semester hours)

English 365

Arts 255

Arts 305

## FILM AND MEDIA MAJOR

(35-40 semester hours)

CAS 145

CAS 190

Two from CAS 201, CAS 218, CAS 222 (3hrs), CAS 230, CAS 248, CAS 249,

CAS 250, CAS 254, CAS 255, CAS

281, CAS 282, CAS 284, CAS 290,

CAS296/English 238, CAS 305, CAS

316, CAS 319, CAS 323, CAS 346, CAS

351, French 375, CAS 390, CAS 395,

CAS 399 (may be repeated for elective credit), one approved Interim)

CAS 399 (topical sections)

Courses from one emphasis

### Studies Concentration

(18-21 semester hours)

One from CAS CAS 218, CAS 222 (3 hrs), CAS 248, CAS 249, CAS 250, CAS 290, or CAS 319

Two from CAS 201, CAS 254, CAS 255, or CAS 284

Two from CAS 230, CAS 281, or CAS 282 CAS 395 or an additional CAS 399 (must

have taken at least two courses in the major, or obtained permission of instructor; may be repeated twice for credit under a different topic)

### Production Concentration

(18-20 semester hours)

CAS 290 (prerequisite CAS 190)

One from CAS 248, CAS 249, CAS 250 (prerequisite CAS 190)

CAS 351 (Prerequisite CAS 290 or permission of instructor)

One from CAS 222 (3 hours), CAS 346, or CAS 390

One from CAS 230, CAS 281, CAS 282

One from CAS 201, CAS 254 CAS 255, or CAS 284

**ORGANIZATIONAL  
COMMUNICATION MAJOR**

A grade of at least a C in Business 160 and in either CAS 141 or 190 is required to be accepted into this major.

(34-35 semester hours)

CAS 141 or 190

CAS 240

CAS 262 or English 262

Business 160

Business 203

Business 360

Two from CAS 285, Business 365, 380,  
or 382

One from CAS 352, Business 362,  
or Philosophy 215

One from CAS 211 or 305

One from CAS 253, 260, 270,  
or Sociology 250

**Cognates**

(12 semester hours)

Economics 221

Economics 222

Statistics 143

Information Systems 171

One from Information Systems 141, 151,  
or 153

**STRATEGIC COMMUNICATION**

(33-38 semester hours)

CAS 101 or 141

CAS 200

CAS 211

CAS 238

CAS 305

**Courses from one track**

**Professional Track**

(34-38 semester hours)

CAS 180, 190, or 222

CAS 262

CAS 285

Two from CAS 201, 240, 248; Art Studio  
255, 256, 305; one from CAS 249, 290,  
351, Computer Science 100, English 365

One from CAS 300-level elective: CAS 346  
or approved elective

CAS 352 or 399

**Rhetoric Track**

(33-37 semester hours)

CAS 205

Two from CAS 240, 260, 270, or 318

CAS 399

Three from CAS 300-level electives, CAS  
346 or approved alternative

**THEATRE MAJOR**

(35-37 semester hours)

CAS 117

CAS 120 (4 sem. hours)

CAS 218

CAS 316

CAS 319

CAS 346

Two from CAS 180, 203, 303, 323, 390, 395

One from CAS 320, 321

One from CAS 248, English 334, or 338

One from CAS 399, Philosophy 208

**CAS MINOR**

(18-20 semester hours)

CAS 180 or 190

CAS 200 or 211

CAS 117 or 203

CAS 201 or 284

2 CAS electives, one of which must be a  
300-level course

**ELEMENTARY EDUCATION  
COMMUNICATION ARTS AND  
SCIENCES MINOR**

(23-24 semester hours)

CAS 140

CAS 190

CAS 203

CAS 204

CAS 214

SPAUD 101

CAS 117

One from CAS 218, 316 or an approved  
interim

**FILM AND MEDIA MINOR**

(18-23 semester hours)

CAS 145

CAS 180

CAS 230, 281, or 282

Three courses (nine credits minimum)

listed in the Film and Media major,

one of which must be at the 300-level.

**SECONDARY EDUCATION**

**CAS MINOR**

(20-21 semester hours)

CAS 101

CAS 140

CAS 190

CAS 203

CAS 204

CAS 217  
One from CAS 218 or 316 or an approved interim

### **THEATRE MINOR**

(19 semester hours)

CAS 117

CAS 120 (2 hours)

CAS 218

CAS 316

CAS 319

One from CAS 203, 248, 303, 320, 321, 323, 395

### **FINE ARTS ELEMENTARY MINOR**

(24 semester hours)

Art Education 315

CAS 214

Education 210

Music 239

Elementary Dance Interim or PER 150

One from Art 153, Studio Art 250, Art History 101, 102, Art or Art History interim

One from CAS 190, 200, 203, 117, 218, 303, 316, CAS Interim

One from Dance 202, 310, 330, or Dance interim

One from Music 100, 103, 106, 107, 108, 203, 120 (2), 130 (2), 190 (2), or a Music interim

JoAnn VanReeuwyk (Art), Phil Hash (Music) and Debra Freeberg (CAS) are advisors for the fine arts minor.

### **ELEMENTARY EDUCATION LANGUAGE ARTS MAJOR**

(39 semester hours)

One from English 334, 335, CAS 215, 311

CAS 214

CAS 203 or CAS or English performance-based interim

Education 322

Education 326

English 261

English 374 or 375

English 230

English 340 or 341

English 351

English 358

One from English 200, 225, 300

One approved elective from the CAS or English Departments

### **ELEMENTARY EDUCATION LANGUAGE ARTS MINOR**

(24 semester hours)

CAS 214

CAS 203 or CAS or English performance-based interim

Education 326

English 340 or 341

English 351 or 352

One from English 370, 372, CAS 215, 311

One from English 261, 374, 375

One from English 230, 200, 225, 300

### **COURSES (CAS)**

**101 Oral Rhetoric (3).** F, S. Students examine the principles of oral and visual rhetoric in this course, with an emphasis on guided practice in the development of effective speeches. The course leads students to understand the role of rhetoric in society, to think critically about rhetorical situations and practices, and to gain proficiency in the art of rhetoric.

**117 Introduction to Theatre and Drama (3).** F. A cultural examination of theatre and drama from script to performance, introducing students to the various components of the art. Students develop an understanding of how playwrights, actors, designers, directors and technicians collaborate in visual storytelling. Through reading scripts, viewing live and filmed performances, and engaging in discussion, students gain an enriched awareness of the theatrical process, learning how to understand and write about the theatre both critically and sensitively.

**120 Calvin Theatre Company (1).** F, S. Membership in this production practicum is determined annually by interview/audition. Members are actively encouraged to explore the intersection of their Christian faith and the production of high-quality pieces of theatre. In the process, they receive training in the various practical aspects of theatre through participation in one production each semester. Students may participate more than one year and are encouraged to experience as many different aspects of production as possible, both onstage and backstage. Theatre majors must complete four semester hours for the major, while minors must complete two semester hours. No more than six semester hours may count toward the requirement for graduation. Prerequisite: A cumulative GPA of 2.0 or higher

**140 Communication and Culture** (3). F. This course examines the ways in which communication is used to create, maintain, and change culture. Students have the opportunity to apply a basic understanding of the concepts of communication and culture to a range of contemporary social issues, cultural texts, and communication practices. Emphasis is given to rhetorical and discussion methods to help students learn about analyzing and constructing oral and written arguments and to work cooperatively doing a research project for class presentation.

**141 Visual Rhetoric** (3). F. S. This course is a study of the rhetoric of images, how images create meaning, and how images are used to persuade. It leads students to understand the relationship between the rhetoric of images, the various audiences for those images, and their social contexts. Students learn to critique the construction of images, the ethical use of images, and the various meanings of images.

**145 Introduction to Film and Media** (4). F. S. A study of film and other moving image media as art forms and cultural phenomena, including dramatic, visual, and sonic elements, theme and focus, acting, and directorial style. Topics covered include the materials and methods of media production, the major styles and genres of moving image media, and the relationship of film and television to American and world culture. Course work includes a mandatory weekly screening (lab) and readings in the history, theory, and criticism of film and television.

**180 Communicating with Digital Media** (3). F. S. An introduction to the principles and practice of communicating a message to an audience through digital images (still pictures, moving pictures, and graphics) and digital sound (voice, music, ambient sound, and sound effects). Students will learn the fundamental techniques of preproduction planning, camera use, lighting, sound, and editing in order to communicate their ideas effectively, artistically, and ethically. Students also will learn to communicate their messages through digital channels, especially the Internet. The course will enable students interested in social media, public relations, advertising, journalism, corporate training, sales, e-learning, publishing, worship, and the arts to realize ideas through sound and

image. Students attending advanced Media Production courses must take CAS 190.

**190 Introduction to Digital Filmmaking** (4). F. S. An introductory course in film-style production. Instruction includes pre-production planning, scriptwriting, image capture, sound, lighting and editing. Students will produce a series of exercises and a short finished video. Equipment is provided. Prerequisite for 200- and 300-level Digital Filmmaking courses.

**200 Advanced Oral Rhetoric** (4). S. Composition and presentation of types of speeches, participation in various types of speeches, participation in various types of discussion, readings in rhetorical theory, and criticism of selected contemporary speeches. Prerequisite: CAS 101, 141, or equivalent.

**201 New Media** (3). F. S. New Media offers students an advanced understanding of new media technologies, especially the ways in which new media have influenced human communication practices. Students will investigate cultural and rhetorical elements of online communities, virtual environments, new media technologies, digital communication strategies, and a variety of contemporary issues in the computerization of communication in work, home, church, and public discourse.

**203 Performance Studies** (3). S. An introduction to performance as a means of analyzing, appreciating, and celebrating life and literature. By providing training in the principles and techniques of performing before an audience, this course expands students' understanding of the relationships between text and performance, literature and human action, and written and oral forms of discourse. Genres examined include poetry, prose, non-fiction, oral history, and Biblical literature.

**204 Directing Co-Curricular Programs** (1). This course explores how co-curricular programs, such as forensics and debate, are organized, administered, and implemented in schools. Students will explore the principles and rationale behind such programs and develop the instructional and assessment skills required to facilitate them. Students will participate in school settings. Not offered 2015–2016.

**205 American Voices** (3). This course examines American oratory as an art form, an influence on the American experience, and a reflection

tion of American culture. Students will develop an understanding of oratory as an aesthetic and practical art, deepen their knowledge of the American rhetorical tradition in its historical and intellectual contexts, and learn how the art of public speaking shapes our understanding of ourselves and our world. Emphasis is given to methods of critical listening and analysis and to how oratory has been transformed by the electronic age and its focus on the image. Not offered 2015–2016.

**211 Argumentation and Advocacy** (3). S. A study and application of basic principles of argumentation and advocacy. This course focuses on the dynamics of oral argument—ethical dimensions, use of language, informal logic, use of evidence and appeals, structure, and interactions with other arguments. Through analysis and practice, students will learn not only how to argue within academic contexts, but how to apply argumentative reasoning to everyday communication.

**214 Creating Communication Arts in the Classroom** (3). F S. This course addresses how the communication arts, such as creative drama, reader's theater, and puppetry facilitate learning in educational settings. Students learn to analyze verbal and non-verbal communication, they engage in the strategies of rhetoric (such as organization, invention, and style) appropriate to the learning process, and they apply these skills and knowledge in school settings.

**218 Acting for Stage and Screen** (3). F. An introduction to the art of acting through readings, discussion, class exercises, improvisations and viewing performances. Students in this course learn the modern theories and techniques of acting, gaining a deep knowledge of how to both critically assess and realize finished performances for the theatre and screen. Focus is on the physical, emotional and textual preparation, exploring the creativity of the actor and culminating in a final performance.

**222 Calvin Media Company** (1). F S. Students will participate in film, radio and television productions. Students may participate more than one semester, but no more than four semester hours may be applied toward major or graduation requirements. Permission of instructor required.

**230 Media Cultures** (3). F. A historical study of 20th and 21st century media and their various aesthetic, cultural, global, and political contexts. The relationship between the media arts and society motivates this historical survey of print journalism, advertising, radio, television, digital media and the Internet. Topics will include globalization, media systems, media industries, and mass consumption.

**238 Theory and Communication** (3). F. An examination of the significance and role of theory in understanding the nature of human communication. The course focuses on the fundamental elements of communication processes, the assumptions that underlie communication theory, the similarities and differences between theoretical approaches, and the means of evaluating theoretical perspectives, including a Christian critique of communication theories.

**240 Group Communication** (3). F. Small group communication theory and practice. Students participate in group projects leading to class presentations. Topics include leadership, discussion, roles, consensus, organization, decision-making, leadership, and persuasion. Standards for ethical conduct are considered throughout the course.

**248 Writing for the Media** (3). F. An introduction to the content, styles, and formats of media scripts. The course emphasizes the differences in media writing compared with more familiar forms of writing, the role of the script as text in producing media programs, the styles of writing used (journalistic, dramatic, polemical, and emotive), and the technical requirements for scripts used to focus the work of directors, actors, camera, and sound technicians, editors and mixers in creating a media product. Topics: playwriting and scriptwriting. Prerequisite: CAS 190.

**249 Digital Audio Production** (3). S. A course in the ethical, aesthetic, technical, and organizational principles that govern the recording and post-production of dialogue, music, and effects. Prerequisite: CAS 190.

**250 Multi-Camera Production** (3). S. An introduction to the theory and practice of studio-based video production. Various program formats are discussed and evaluated in light of particular communication principles and needs. Students gain experience with



stationary video cameras, recorders, switchers and related technologies. Performance for the camera, studio lighting, audio recording and mixing principles are analyzed and demonstrated. Prerequisite: CAS 190.

**253 Intercultural Communication (3).** F. S. An examination of the anthropological principles relating to cross-cultural communication. This examination requires an extensive comparison of the components of cultural systems and the nature of cultural dynamics. The areas of application include government, business, Peace Corps, development, and mission work, with special emphasis on the last two. Special topics include developing an appropriate attitude regarding indigenous cultures and the management of culture shock. Also listed as Sociology 253.

**254 Film and Media Criticism (3).** S. The theory and practice of film and media criticism. This course develops a Reformed lens for consumers and producers of media to evaluate film and mass media on behalf of church and society. Students write audience-focused reviews and evaluate others' criticism of media such as television, film, radio, popular music, and new media technologies (including the internet, digital music, video games, and blogs).

**255 Documentary Film and Television (4).** F. An examination of the history, aesthetics, ethics and cultural and institutional functions of documentary film and television. Course includes a mandatory weekly screening (lab).

**260 Interpersonal Communication (3).** F. The interpersonal communication opportunities and problems faced by Christians as they seek to live the life of faith in contemporary society. The course focuses on the theories and the practice of interpersonal communication. Topics include the elements of dyadic communication, shyness, gender, conflict management, and relational enrichment.

**262 Business Communication (3).** S. This course will instruct students in the theories, principles and practices of business communication. Subject matter will include organizational culture, communication ethics, conflict negotiation, public presentations, appropriate uses of visual aids, listening, interviewing, and business writing. Prerequisite: CAS 101 or CAS 141, and English 101.

**270 Communication and Gender (3).** Study and Christian evaluation of the relations between communication and gender, especially in interpersonal relationships, family, business, religious organizations, and educational institutions and religious settings. Not offered 2015–2016. Alternate years, fall semester.

**281 Film and Cultures I (4).** F. A study of the development of film from its inception to 1960, considering cinema as an art form in the context of culture, technology, and economics. Topics include the invention of film, silent film, the rise of the classical Hollywood style and alternatives, the coming of sound, color, and widescreen, the global influence of and resistance to Hollywood, and the most important films, directors, and movements of world film. A weekly screening lab is mandatory.

**282 Film and Cultures II (4).** A study of the development of film from 1960 to the present, considering film as an art form in the context of culture, technology, and economics. Topics include the European art cinema, the “New Hollywood”, the development of the blockbuster, creative and economic influences on cinema outside the United States, the most important films, directors, and movements in film, and the impact of developing digital technologies on cinematic art. A weekly screening lab is mandatory. Not offered 2015–2016

**284 Film and Media Theory (3).** S. An introduction to the key aesthetic and cultural paradigms employed in the study of film and media. Students are introduced to the diverse ways in which media is examined and critiqued, central theoretical, ethical, and critical issues surrounding the study of the moving image media, and major theories based on cognitive, ideological, semiotic, structuralist, feminist, and cultural perspectives. Various schools of film and media criticism (e.g., formalist, auteur, genre, humanist, and religious) are considered. **285 Advertising and Public Relations (3).** F. S. How and why organizations use advertising and public relations to influence various publics. The course emphasizes the historical development of advertising and public relations, as well as current issues in these industries.

**290 Intermediate Digital Filmmaking (3).** F. An intermediate-level course in video production. Course includes further development of technical and creative skills, with

special emphasis on the planning and production of documentaries, narrative, and art films. Prerequisite: 190.

**296 Film as a Narrative Art** (3). In-depth examination of the art of narrative film, focusing each semester on one or more directors, genres, or styles of filmmaking. The course pays particular attention to narration and narrative structure, characterization, conflict, setting, and point of view and also acquaints students with literary adaptation and with the contribution of film image and sound to narrative development. The course emphasizes the development of student skills in writing about film. Not offered 2015–2016.

**303 Applied Theatre** (3). F. A study of the theory and practice of theatre and drama used for human reflection or to raise awareness and effect social change. Students will learn to apply the core practices of facilitating, scripting and play-building to real-world contexts, while performing community service work with local agencies. Topics of study will depend on agency partnerships, but may include cross-cultural performance, community-based drama, theatre of social justice or development or the creation of theatrical texts from oral histories or personal narratives, and as such the course may culminate in an original, devised theatre performance. May be repeated, but may not count as more than one course toward the theatre major.

**305 Persuasion and Propaganda** (3). F, S. The theory and practice of persuasive communication. Topics include theory and research of persuasion, improving personal persuasive abilities, recognizing and resisting persuasive strategies, and the role of propaganda in modern society. Examples for analysis are taken from advertising, religion, sales, political campaigns, and democratic and totalitarian propaganda.

**316 Directing for Stage and Screen** (4). An introduction to the practice and theory of directing. Through readings, critical analysis of scripts, discussions, performance exercises, and critique of live and filmed performance, students develop an understanding of the directing process from the inception of the script to the final product. Students create a full directorial analysis of a script and produce several finished scenes, applying rehearsal

techniques, working with actors and learning to enhance their own productions through careful criticism and thoughtful assessment of the art of directing. Not offered 2015–2016

**318 American Politics and Mass Media** (3). A survey of the relationship between American politics and the mass communications media. The course covers the way the federal government, through its regulations and its dissemination of information, affects the operations of the media, and how the media influence the social and political values of Americans and the functioning of the political system. Also listed as Political Science 318. Not offered 2015–2016

**319 Production Design** (4). S. A study of the craft and art of production design for theatre, television and film from introductory technical production practices to finished design projects. Includes reading discussions, student presentations, workshops, demonstrations and group critique of student artwork aimed toward the development of basic competence in scenic, wardrobe and lighting design. Special attention is paid to the communication of design ideas in the form of written concept descriptions and oral presentation of work as well as the visual communication tools of the artist, including the use of basic computer design and visualization technologies. **320 World and Ancient Theatre History** (3). A historical and cultural study investigating a range of influential world theater traditions, including: the ancient theatres of Greece, Rome and India; the classical age of African dance and theatre; the golden ages of classical Chinese and Japanese dance-song-theatre; and the religious ritual drama of First People's theatre in the Americas. The course will focus on a study of theatre's early sources, considering especially the religious and ritual elements of theatrical development. In so doing, the course will examine various viewpoints such as the impact of cultural identity, religious identities, gender roles, aesthetics, the meaning of power and the meaning of play. Not offered 2015–2016

**321 Western Theatre History** (3). S. A historical and cultural study investigating a wide range of western theatre traditions mainly from the Renaissance to the present. The history of theatre is studied as an art, as a medium of cultural expression and communication, and as a social institution. The

theatre of the past is examined both for its own artistic techniques and for the knowledge that it may shed on the cultural patterns and values of the societies in which it has served as a forum of the public imagination.

**323 Advanced Acting for Stage and Screen** (3). In this course, students develop advanced performance skills including identifying and playing in different styles, detailed character analysis, and scene study. Students learn techniques for both stage and camera acting, culminating in a final performance project in each medium. Not offered in 2015–2016

**346 Internship in Communication** (3). F, S. Students work in profit or non-profit communication under the supervision of a professional. Students must work with the Career Development Office and obtain an internship prior to the start of the semester. Typical placements include public relations or advertising agencies, broadcast or cable stations, video production companies and the like. A journal and seminar participation are required. Grading is based on the professional's evaluation, the student's daily journal, and seminar participation. Prerequisites: Junior or senior status, 2.5 GPA, and permission of the department.

**351 Advanced Digital Filmmaking** (3). F, S. The intensive study and production of video in a particular style or genre. The course focus, designated by a subtitle, will alternate among various genres of style, content, and form. Thorough investigation of creative, ethical, and technical requirements will culminate in student-produced projects. Prerequisite: CAS 290.

**352 Communication Ethics** (3). F. This course examines the moral dimensions of human communication, exploring dilemmas in interpersonal, group, and mediated communication, with special reference to

problems encountered in communications professions. While wrestling with cases and controversies, students also review and apply historic criteria for coming to reasoned moral judgment, including the contemporary voices of feminist, determinist, post-modern, and naturalist ethicists. Major Christian positions are reviewed and applied. Case studies are the focus, with a variety of learning opportunities and encouragement for students to pursue personal learning objectives.

**390 Independent Study**. F, I, and S. Independent study of topics of interest to particular students, under the supervision of a member of the department. Prerequisite: permission of the instructor.

**395 Special Topics in Communication: Advanced Screenwriting** (3). S. An in-depth study of feature-length film structure, story, character development and dialogue through the creation and completion of an original feature-length screenplay over the course of the semester. Workshop format.

**399 Interviewing Principles and Practices** (3). In this course, you will study the theoretical principles of interviewing and improve your communication skills for participating in successful interviews. You will gain the knowledge and skills needed to take part in several types of interviews including: job selection interviews, focus group interviews, medical interviews, broadcast and print journalism interviews, and interviews for documentary filmmaking. In addition, you will develop a Christian ethic of interviewing. For instance, you will learn to articulate a philosophy of communication that values others and does not treat them instrumentally—and to enact that philosophy when you take part in interviews.

# Computer Science

Professors J. Adams (chair), H. Plantinga, K. Vander Linden

Associate Professor P. Bailey

Assistant Professors S. Nelesen, V. Norman

The department offers a variety of major concentrations for students who wish to pursue a computing-related vocation. These include the Bachelor of Computer Science degree for students who wish to focus primarily on computer science; the Bachelor of Arts and Bachelor of Science in computer science for students who wish to combine a study of computer science with another discipline; the Bachelor of Arts in digital communication for students who wish to study website design, creation, and software development for professional communications; and the Bachelor of Arts in information systems for students who wish to combine a study of computing applications with business and management. The Bachelor of Computer Science degree is accredited by the Computing Accreditation Commission of ABET. The department also offers minors in computer science, computer science for students in the secondary education program, and information systems. More information about the departmental programs is available at the departmental website ([cs.calvin.edu](http://cs.calvin.edu)).

## **BACHELOR OF COMPUTER SCIENCE (BCS)**

(39-43 semester hours)

Computer Science 108

Computer Science 112

Computer Science 212

Computer Science 214

Computer Science 232

Computer Science 262

Computer Science 195 (3 semesters)

Computer Science 295 (3 semesters)

Computer Science 384

Computer Science 396 and 398

Four from Computer Science 300-380\*,

Information Systems 300-370, Engineering 304, 325, or an approved interim. At most one elective can be taken from Information Systems 333, 337, and 341.

All departmental courses for the BCS must be completed with a grade of C- or higher.

### **Cognates**

(39 semester hours)

Mathematics 156

Mathematics 256

Mathematics 171

Mathematics 172

Statistics 243

One college laboratory science elective selected from Astronomy 211, 212, Biology 160, 161, 230, Chemistry 103, 104, Geology 151, 152, Physics 132, 133, 235

Two additional courses selected from the

laboratory science electives listed above and courses that count toward the Mathematics major. The total number of hours of mathematics and laboratory science courses must be at least 30.

## **BACHELOR OF ARTS IN COMPUTER SCIENCE (BA)**

(36-40 semester hours)

Computer Science 108

Computer Science 112

Computer Science 212

Computer Science 214

Computer Science 232

Computer Science 262

Computer Science 195 (3 semesters)

Computer Science 295 (3 semesters)

Computer Science 384

Computer Science 394 or 396 and 398

Three from Computer Science 300-380\*,

Information Systems 300-370, Engineering 304, 325, or an approved interim. At most one elective can be taken from Information Systems 333, 337, and 341.

### **Cognates**

(20 semester hours)

Engineering 220

Mathematics 156

Mathematics 256

Mathematics 171 or Mathematics 132

Statistics 143 or 243 (preferred)

A minimum grade of C (2.0) in 212, 214, 232 or 262 is required for admission to these concentrations.

Students completing at least 58 hours of mathematics or science may elect to receive the Bachelor of Science degree in computer science rather than the Bachelor of Arts degree.

### **COMPUTER SCIENCE MINOR**

(18-24 semester hours)

Computer Science 108, 106, or 104

Computer Science 112

Four elective courses (of at least 3 credit hours) from Computer Science 200-380\*, Information Systems 300-380, Engineering 220 or 325, including at most one approved interim course. Computer Science 212 is recommended. At most one elective may be taken from Information Systems 333, 337, and 341.

\* *Students may count multiple sections of CS 300 as different advanced electives in their computer science programs, provided those sections address different topics.*

### **SCIENTIFIC COMPUTATION AND MODELING MINOR**

(21-24 semester hours)

Computer Science 106 or 108

Computer Science 112

Information Systems 141

Two elective courses from Computer Science 212, 262, 342, 352, 372, or 374, Information Systems 271 or 341

A 200- or 300-level science or mathematics course (of at least 3 credit hours) that has Computer Science 106 or 108 as a prerequisite, or a significant programming project in a 200- or 300-level science or mathematics course (of at least 3 credit hours) that does not require computation of all its students, or an approved interim

An approved investigatory course that involves significant scientific programming (e.g., Astronomy 395, Biology 385 or 399, Chemistry 385, 395, or 397, Computer Science 394 or 396/8, Geology 395, Mathematics 395, Physics 395)

### **MINOR IN COMPUTER SCIENCE FOR STUDENTS IN THE SECONDARY EDUCATION PROGRAM**

(21 semester hours)

Information Systems 171

Information Systems 141

Information Systems 271

Computer Science 100

Computer Science 108

Computer Science 112

Computer Science 212

Education W10

Prior to the secondary education teaching internship, students must have the approval of the department. Criteria for approval are found in the Teacher Education Program Guidebook, available in the Education Department.

### **BACHELOR OF ARTS IN DIGITAL COMMUNICATION (GROUP MAJOR)**

(38-39 semester hours)

Computer Science 100

One from Computer Science 108 or 106

Information Systems 337

One sequence selected from:

- Computer Science 112 and 262

- Information Systems 141, 271, and 341

One from Communication Arts and Sciences 141 or 145

One from Communication Arts and Sciences 180 or 190

Communication Arts and Sciences 201

Communication Arts and Sciences 230

One from Communication Arts and Sciences 248, 249, 285, or 290

One from Communication Arts and

Sciences 346 or Computer Science 394

One from Communication Arts and Sciences 399 or Computer Science 384

### **Cognates**

(9 semester hours)

Art 255

Art 305

English 365

### **BACHELOR OF ARTS IN INFORMATION SYSTEMS**

(47-49 semester hours)

Information Systems 141

Information Systems 171

Information Systems 271

Information Systems 341

Information Systems 371

Two from Computer Science 300-380,

Information Systems 333 or 337, or an approved interim

Computer Science 108

Computer Science 112

Computer Science 262

Computer Science 195 (3 semesters)

Computer Science 295 (3 semesters)

Computer Science 384  
 Business 160  
 Business 203  
 Two 300-level courses from business  
 or economics  
 One from Business 359 or Computer  
 Science 394  
 Economics 221

### Cognates

(8 semester hours)  
 Statistics 143  
 Mathematics 132 (preferred) or 171

### INFORMATION SYSTEMS MINOR

(18-20 semester hours)  
 Information Systems 141  
 Information Systems 171  
 Information Systems 271  
 Computer Science 108  
 Three electives from Computer Science  
 262, 300-level computer science or  
 information systems courses, or an  
 approved interim

### PHYSICS/COMPUTER SCIENCE GROUP MAJOR

(31-33 semester hours)  
 Physics 133  
 Physics 134  
 Physics 235  
 Physics 381  
 Computer Science 106 or 108  
 (106 recommended)  
 Computer Science 112  
 Computer Science 214  
 One from Computer Science 212,  
 Engineering 220, or an upper  
 division computer-science elective  
 Physics or computer science electives (to  
 provide a minimum of 24 semester hours  
 in either physics or computer science)

### Cognates

(16 semester hours)  
 Mathematics 171  
 Mathematics 172  
 Mathematics 231 or 256  
 Mathematics 271 or 232

### HONORS

Students wishing to graduate with honors  
 in computer science can do so by completing  
 the departmental honors program. In addi-  
 tion to the requirements of the college honors  
 program, the Computer Science Departmen-

tal honors program requires further course-  
 work and a senior honors project. Details  
 are available from the department website.  
 This program requires careful planning to  
 complete, and students should normally ap-  
 ply for admission to the departmental honors  
 program in their sophomore year.

## COURSES

### Computer Science (CS)

100 **Creating Interactive Web Media** (3),  
 F An introduction to the creation of interac-  
 tive media for the World Wide Web. Coverage  
 includes markup language, stylesheets, page  
 layout and design principles, scripting, ani-  
 mation, multimedia and their representations,  
 World Wide Web history and structure, social  
 and ethical issues. Laboratory. Meets the in-  
 formation technology core requirement.

104 **Applied Computing** (2). F An introduc-  
 tion to problem solving and program design  
 for engineering students. Coverage includes  
 algorithmic thinking, problem decomposi-  
 tion, types and expressions, functions and pa-  
 rameter passing, control structures, I/O, sim-  
 ple data structures, and classes (including the  
 use of inheritance). Prerequisite Mathematics  
 132 or 171, which may be taken concurrently.

106 **Introduction to Scientific Computa-  
 tion and Modeling** (4). F An introduction to  
 computing as a tool for science, emphasizing  
 programming as a methodology for problem  
 solving, quantitative data analysis, and simu-  
 lation in science and mathematics. This in-  
 cludes in silico modeling of natural phenom-  
 ena, precise specification of a problem, design  
 of its algorithmic solution, testing, debugging,  
 and maintaining software, using scripting to  
 increase scientific productivity, and the use of  
 existing scientific software libraries. A second-  
 ary emphasis is the discussion of breadth top-  
 ics, including historical, theoretical, ethical  
 and biblical perspectives on computing as a  
 discipline. This course provides an alternative  
 to Computer Science 108, providing an intro-  
 duction to computing focusing on scientific  
 examples and applications. Laboratory. Meets  
 the information technology core requirement.

108 **Introduction to Computing** (4). F, S.  
 An introduction to computing as a problem-  
 solving discipline. A primary emphasis is on  
 programming as a methodology for problem

solving, including: the precise specification of a problem, the design of its solution, the encoding of that solution, and the testing, debugging and maintenance of programs. A secondary emphasis is the discussion of topics from the breadth of computing including historical, theoretical, ethical and biblical perspectives on computing as a discipline. Laboratory. Meets the information technology core requirement.

**112 Introduction to Data Structures** (4). F, S. A continuation of Computer Science 108, 106 or 104, using C++ classes to introduce and implement the elementary data structures including lists, stacks, queues and trees. Advanced programming techniques such as indirection, inheritance and templates are introduced, along with an emphasis on algorithm analysis, efficiency and good programming style. Laboratory. Prerequisite: Computer Science 104, 106, 108, or permission of the instructor.

**195 Introductory Computing Seminar** (0). F, S. This seminar explores a range of current topics in computing, including topics in research and practice. Students intending to major in a computing-related field must take this course three times in their freshman and sophomore years. Prerequisite: freshman or sophomore standing.

**212 Data Structures and Algorithms** (3). F. A systematic study of algorithms and their application to data structures, including arrays, lists, trees, heaps, hash tables and graphs. Algorithms and data structures are analyzed in their use of both time and space, and the choice of data structure in problem solving is studied. Theoretical issues, such as optimality, best and worst-case performance and limitations of algorithms are studied, as well as implementation issues. Prerequisite: Computer Science 112. Mathematics 156, which may be taken concurrently, is recommended.

**214 Programming Language Concepts** (3). S. Design principles and implementation issues of contemporary programming languages. Topics covered include programming paradigms, the syntax and semantics of programming language constructs, translation of high level languages to machine language, and formal languages. Several different languages are introduced and examined to illustrate these topics. Laboratory. Prerequisite: Computer Science 112 or 212.

**216 Programming Challenges** (1). A hands-on laboratory forum to use the data structures and mathematics of other courses on a variety of problems, ranging in difficulty. The course consists of working on a variety of problems and examining techniques used in their solution. Students may take this course multiple times, the course does not count towards the major. Grading is pass/fail. Prerequisite: Computer Science 212 and Mathematics 156, which may be taken concurrently.

**232 Operating Systems and Networking** (3). S. An introduction to the major concepts modern operating systems must address. Topics include operating system structure, processes and threads, inter-process communication and synchronization, scheduling, main and secondary memory management, file systems, networking, client-server systems, distributed systems. Prerequisite: Computer Science 112 and either Engineering 220 or 304.

**262 Software Engineering** (3). F. A survey of software engineering principles including software project management, system and requirements analysis, the design and implementation of software, design patterns, software quality assurance and testing, software maintenance and the use of CASE tools. Prerequisite: Computer Science 112 and at least junior standing.

**295 Computing Seminar** (0). F, S. This seminar explores a range of current topics in computing, including topics in research and practice. It is a continuation of Computer Science 195. Department majors must take this course three times during their junior and senior years. Prerequisite: junior or senior standing.

**300 Special Topics in Computer Science: Bioinformatics** (3). S, even years. An introduction to algorithms and computational techniques for biological data. Topics include sequence algorithms (such as alignment, searching, assembly and annotation), gene and structure prediction, molecular phylogenetics, and analysis of microarray data. Prerequisites: Computer Science 112 and introductory genetics (Biology 141 or 161), or permission of instructor.

**300 Special Topics in Computer Science: Compiler Design** (4). F, selected years. An introduction to the basic constructs of modern programming languages and to the techniques for implementing these in the ma-

chine language of a typical computer. Topics include grammatical structure, syntax, semantics, storage allocation, error detection, and object code generation. Prerequisite: Computer Science 214.

**312 Logic, Computability and Complexity** (4). F, even years. Topics from the theory of computation including finite state concepts, formal languages and grammars, computability, computational complexity. Also listed as Mathematics 312. Prerequisite: Mathematics 256.

**320 Advanced Computer Architecture** (3). S, selected years. Principles of computer design, instruction set design principles, instruction-level parallelism, cache principles, and multiprocessor systems. Prerequisite: Engineering 220.

**324 Cross Cultural Engagement across the Digital Divide** (1). SS, F, selected years, Pass/Fail. This practicum will engage students with members of other cultures through Project Connect, a technical outreach service project. Students will be oriented to the digital divide issue in early summer, assist in the summer technical literacy courses to various under-privileged groups in the Grand Rapids area, and continue to support those groups in the following fall semester. Students will generally register for the fall semester. CCE credit will be awarded in the fall semester. Prerequisites: Senior status in computer science, information systems, engineering, or permission of the instructor. Meets the cross-cultural engagement core requirement (CCE credit will be awarded in the fall semester).

**332 Advanced Computer Networks** (3). S, even years. This course introduces the student to the field of computer networking. Students will develop an understanding of the general principles of computer communication as they are worked out in an appropriate protocol suite. Specific attention will be paid to principles of architecture, layering, multiplexing, addressing and address mapping, routing and naming. Problems considered include the writing of network software, the physical construction of networks, the Internet and its future development, and network security. Prerequisite: Computer Science 232.

**342 Database Management Systems** (3). S, odd years. An introduction to the structures necessary to implement a database manage-

ment system. Topics include data models (including hierarchical, network and relational data models), normal forms for data relations, data description languages, query facilities. An introduction to existing database management systems is given. Laboratory. Prerequisite: Computer Science 262.

**344 Artificial Intelligence** (3). F, even years. An introduction to artificial intelligence. Topics include problem solving, knowledge representation, planning, machine learning, natural language processing and robotics. Students will be introduced to programming techniques from AI such as heuristic search, expert systems and neural networks, as well as to AI's philosophical, psychological and religious context. Prerequisite: Computer Science 212 (or 112 and permission of the instructor).

**352 Computer Graphics** (3). S, even years. An introduction to interactive 2D and 3D computer graphics techniques such as transformations, lighting, shading and hidden surface removal, photorealistic rendering including ray tracing and image processing. Programming projects with graphics libraries such as Qt and OpenGL. Prerequisite: Computer Science 212 and Mathematics 256.

**364 Computer Security** (4). F, odd years. An introduction to the principles of computing security. Topics include encryption, protocols, security models, trusted systems, program security, network security, legal and ethical issues. Laboratory. Prerequisite: junior standing and at least one of Computer Science 232, 332, or Information Systems 333.

**372 Numerical Analysis** (4). S, odd years. Analysis of errors in numerical methods, real roots of equations, approximations using polynomials, numerical integration, applications to differential equations, Lagrange and spline interpolation, least squares approximations, orthogonal polynomials and applications. Also listed as Mathematics 335. Prerequisites: Computer Science 104 or 108 and Mathematics 256 or 232.

**374 High Performance Computing** (3). F, odd years. A study of architectures, algorithms and programming techniques that help minimize the execution times of computer programs that solve particular problems. Topics include high performance computer architectures, parallel program-



ming techniques for distributed and shared-memory multiprocessors, code optimization and hands-on experience using the Calvin College supercomputer. Laboratory. Prerequisite: Computer Science 112 and junior standing or permission of instructor.

**384 Perspectives on Computing** (3). S. This course addresses social, ethical, legal and professional issues that arise in computer science from a Reformed, Christian perspective. Social issues concerning the computerization of society include privacy, security, the digital divide and changes in the way people receive information and relate with others. Ethical discussion starts with a survey of ethical theories and covers professional, ethical and legal issues in areas including intellectual property, privacy, liability and professional codes of conduct. In addition, some foundational issues are covered, including materialist vs. Christian view of what it means to be a person. Prerequisite: last year of a computing-related program. Meets the integrative studies requirement.

**390 Independent Study** F, I, S.

**394 Senior Internship in Computing** (3). F, S. Interns will work 10-20 hours per week in a local business or non-profit organization under the supervision of a computing professional. The internship experience will give students the opportunity to apply skills and concepts acquired in the classroom to a supervised real-world setting. The intern will be expected to maintain a reflective journal and complete a summary paper. Interested students must contact the instructor before registering for the course. Prerequisite: Computer Science 262 and senior standing.

**396 Senior Project in Computing** (2). F. This is the first course of a two-semester sequence, in which the student will complete a department-approved computing project. This capstone experience will give students the opportunity to apply concepts and techniques learned in the classroom by developing a significant computing application. The first semester will typically focus on any necessary library research, design and prototyping, implementation and wiring should normally be done in the second semester. The student will submit regular progress reports to a supervising faculty member and submit a preliminary

report on the project's status for evaluation by a departmental committee. Prerequisite: 262 and senior standing. Students may, with department permission, receive credit for 396/398 by taking Engineering 339/340.

**398 Senior Project in Computing II** (2). S. A continuation of computer science 396. The student will submit regular progress reports to a supervising faculty member and submit a final report for evaluation by a departmental committee. Prerequisite: Computer Science 396.

### Information Systems (IS)

**141 Computing with Databases** (1). F, S. An introduction to information processing with databases. This course introduces table structure, keys, queries, reports and the relational database model. Prerequisite: foundations of information technology core.

**171 Computing with Spreadsheets** (1). F, S. An introduction to numerical computation using spreadsheets, including basic operations, graphs and charts, decision making, data management and macros. Prerequisite: foundations of information technology core.

**271 Introduction to Information Systems** (3). F. Students are introduced to the fundamentals of an information system that builds on their knowledge of programming and desktop computing tools. Specific topics include general systems theory concepts as applied to information technology, applying business rules to systems, defining system requirements, and managing data as a strategic asset through a business perspective and use of a development framework. Christian-based team and leadership issues in a technical environment are also explored. Concepts are exercised through lab assignments that include Microsoft technologies and the .Net framework using C#. Prerequisite: Information Systems 141 and Computer Science 108 (Information Systems 141 may be taken concurrently).

**333 Network Administration** (3). S. This course prepares students to set up and administer TCP/IP, Linux, and/or Microsoft networks. Topics include network protocols such as TCP/IP, networking hardware including wiring, interface, hubs, switches and routers, proxies, security and firewalls,

social, legal and ethical issues. Prerequisite: Computer Science 108.

**337 Introduction to Website Administration** (3). F This course prepares the student to administer a site on the World Wide Web. Topics include platform options, server installation and configuration, creating web documents, an introduction to web scripting, legal and ethical issues. Prerequisite: Computer Science 108, or permission of the instructor. Computer Science 100 or knowledge of HTML, CSS and JavaScript is recommended.

**341 Database Administration** (3). S, even years. This course prepares students to set up and administer database servers and clients on a network. Topics include an introduction to database design, SQL programming, principles for interfacing with a database server

using Microsoft technology, issues in data management, integrity and security, legal and ethical issues. Prerequisite: Information Systems 141, 271 or permission of the instructor.

**371 Information Systems Leadership** (3). S, odd years. This course explores the role of the Chief Information Officer and the key Christian leadership issues within a technical environment. It emphasizes aligning IT to provide optimal value to organizational missions. It explores the economic considerations of IT management, including project budgeting, outsourcing analysis, financial ratios applied to technical investments and establishing service level agreements. The course will address these issues in the context of a significant, full-class project. Prerequisite: Computer Systems 262 or permission of the instructor.

## Congregational and Ministry Studies

*Professor J. Witvliet (chair)*

*Assistant Professor T. Cioffi*

*Adjunct N. Bradford, D. Cooper, L. Barger Elliott, M. Hulst, M. Lundberg, M. Mulder, S. Roels, J. Smith*

The Department of Congregational and Ministry Studies aims to provide opportunities for classroom learning, research, and internships to help students critically examine how every other major and program in the college contributes to the life of the church and its ministries. Along with other contributions in culture and society more broadly, academic preparation for knowledgeable contributions to the church is crucial. This is accomplished through the offering of ministry studies courses, an internship program open to students in all majors, and several ministry-related interim courses.

The department offers students an integrated “Ministry Leadership Minor” that can be combined with nearly any other major or program on campus. This flexible ministry minor allows students either to explore several areas of ministry or to emphasize studies in one of the following areas: community development, congregational studies, missions, music in worship, pastoral ministry, worship, youth ministry.

All students in the minor will benefit from interdisciplinary study of congregational life (CMS 151), courses that explore both their area of emphasis and other ministry areas, liberal arts cognate courses that will provide essential supplemental perspectives on their area of emphasis, and an internship course with placement in their area of interest (CMS 381)

The department does not offer any majors. We encourage students interested in careers in congregational and other ministries to attend seminary (see information below on pre-seminary advising), and to pursue a broad liberal arts education at Calvin College, with particular attention to the study of religion.

### Pre-Ministry Advising

The department is the hub for the college’s advising of pre-ministry students. For further information see the Pre-Professional Programs section of the catalog. A library

of informational literature from various seminaries and divinity schools is available to pre-ministry students in the Religion Department faculty room. Prof. Matthew Lundberg, associate professor in the Religion Department, is the coordinator of pre-ministry advising.

### **Jubilee Fellows Program**

The Jubilee Fellows program is a selective opportunity for Calvin College juniors to explore futures in ministry leadership. Each fall, junior-level students are selected to participate in the program. A spring seminar style course is followed by a 10-week summer internship. During the fall of their senior year, Fellows use their leadership gifts in service to the Calvin community. For further details contact Kary Bosma, Jubilee Fellows Program Coordinator.

### **Ministry Internships**

We offer for-credit and non-credit ministry internships for those who want to explore church ministry. For-credit internships are described more fully under CMS 381. For non-credit internships, the relationship between student and church will be similar to that between a hospital intern and a teaching hospital. It will be an onsite experience with close supervision. Find out more about non-credit internships through the Career Development Office. Make an appointment to see Prof. Todd Cioffi or Prof. Lynn Barger Elliott, or visit the career development office to explore your options.

### **Ministry Resource Center**

The Ministry Resource Center, located in the northeast corner of the fourth floor of the Hekman Library, provides resources for all students and regional community members involved in Bible studies, prayer ministries, worship leadership, urban neighborhood ministry, volunteer service, and more. Contact Rev. Eugene Schemper, Director of the Ministry Resource Center Hekman Library.

### **MINISTRY LEADERSHIP MINOR**

(20-21 semester hours)

CMS 151

One from Religion 230-253 (if Biblical II taken for core) or Religion 211-224 (If Theological II taken for core)

One emphasis from below

One from CMS 374, 375, 378, Religion 237, 252, or Music 236, or 3 sections of 251 (course must be distinct from courses taken for emphasis)

CMS 381

### **Emphases**

Community Development: CMS 375, Religion 295, and one from Sociology 302, International Development Studies 355

Congregational Studies: Sociology 311, 303, and one from Sociology 302 or Religion 379

Missions: Religion 252, Sociology 303, One from Religion 251, 255, 352, 353, 354, 355, or 356

Music in Worship: Religion 237, Music 236, and three hours from MUSC 131, 182, and/or 221

Pastoral Ministry: three hours (sections of CMS 251, CMS 378 or Religion 237, and one from Sociology 250, Communication Arts and Sciences 253, or 260

Worship: Religion 237, Music 236, and one from Art History 232, Art History 233, or Religion 379

Youth Ministry: CMS 374, Education 309, and Psychology 202

### **COURSES (CMS)**

**151 Church and Society** (3). F This course introduces students to the study of human social activity through the lens of the church as a societal institution in the North American context. It also functions as an introduction to the field of congregational studies, analyzing and understanding the social dynamics of the church through social science investigation. This course fulfills the core requirement in Societal Structures in North America category.

**251 Theological Reflections on Ministry Practices** (1). F; S. Students learn to address specific situations, problems, challenges, and

opportunities in ministry through interdisciplinary readings, theological reflection, and strategic planning exercises. Each section of 251 focuses on a unique topic. Students are encouraged to enroll in the course up to 4 times.

**374 Youth and Family Ministry (2).** S. This course provides a forum for students, youth ministry practitioners, and theological scholars to investigate and evaluate a variety of models for the church's ministry to the youth of the church and community. Students, practitioners, and scholars will employ a variety of methods including, but not limited to, a field trip, presentations by nationally recognized youth ministry experts, and critical theological reflection on key issues associated with youth ministry. The course is specially designed for cross registration with students from Calvin College and Calvin Theological Seminary. Prerequisites: junior or senior status. The course is taught at Calvin Theological Seminary.

**375 Ministry, Leadership, and Community Development (3).** S. A study of both the theology and methods used by church and parachurch organizations in local community development. Consideration will be given to developing a theology of leadership and service for local churches and ministries within their respective neighborhood and community. Particular attention will be given to

the church office of deacon as a resource for church and ministry leadership and service. The course is an elective part of the Ministry Leadership Minor, and is required for students pursuing the community development emphasis within the minor.

**378 A Christian Calling: Proclaiming Jubilee as a Christian Leader (3).** S. The aim of this course is to describe the strategic role that leaders within the church have played and continue to play in the economy of gifts God gives to his people, and to assist twelve (12) upper-level students, Jubilee Fellows, to discern whether God might be calling them to become a church leader. Prerequisites: Admission to the Jubilee Fellows program.

**381 Ministry Studies Internship (3).** F. This course links students to internship opportunities in congregations where they are assigned specific responsibilities in congregational and ministry studies. Students work a minimum of eight hours per week under the supervision of an approved on-site supervisor. The weekly academic seminar accompanying the internship involves readings, reflective journals, and a major paper/project and presentation. Prerequisites: junior or senior standing, permission of the instructor, and completion of at least two courses in the minor.

**390 Independent Study (3).** F, I and S. Prerequisite: permission of the instructor.

# Dutch

*Professor H. De Vries (Frederik Meijer Chair of Dutch Language and Culture),*

*Professor K. van Liere*

*Associate Professor \*\*C. Roberts (chair)*

Programs for students wishing to minor or major in Dutch are worked out for them individually by the department advisor. Arrangements for studying Dutch at VU University, Amsterdam, can be made by the departmental advisor. Two semester programs, approved or endorsed by Calvin, are available to students in the cities of Leiden and Zwolle.

The cross cultural engagement requirement is met by the Dutch interim Abroad (W40). The foreign language requirement is met by Dutch 202.

## **DUTCH MAJOR**

(34 semester hours)

Dutch 101

Dutch 102

Dutch 201

Dutch 202

Six 300-level electives, one of which maybe an approved Dutch-language interim in the Netherlands.

Courses taken on semester programs in the Netherlands may apply, provided that students meet with department chair and gain approval for specific courses in advance.

## **DUTCH MINOR**

(25 semester hours)

Dutch 101

Dutch 102

Dutch 201

Dutch 202

Two 300-level electives

An independent study or an approved interim in the Netherlands.

Courses taken on semester programs in the Netherlands may apply, provided that students meet with department chair and gain approval for specific courses in advance.

## **NETHERLANDIC STUDIES MAJOR**

(33 semester hours)

Dutch 101

Dutch 102

Dutch 201

Dutch 202

Three 300-level Dutch courses, one of which may be an approved Dutch-language interim in the Netherlands.

Two from Art History 234, and then (optionally) Art History 237, an approved European History Course, an approved

Religion course, Geography/Engineering and Dutch Landscapes interim. Courses taken on semester programs in the Netherlands may apply, provided that students meet with department chair and gain approval for specific courses in advance.

Prerequisite to a concentration in Dutch is a minimum average of C (2.0) in Dutch 101, Dutch 102, Dutch 201, and Dutch 202. Completion of Dutch 202 meets the foreign language requirement.

## **COURSES (DUTC)**

**101 Elementary Dutch I** (4). F. An introductory course in the comprehension and use of spoken and written Dutch and an exposure to the people and culture of the Netherlands and Flanders, Belgium.

**102 Elementary Dutch II** (4). S. A continuation of Dutch 101.

**201 Intermediate Dutch I** (4). F. Further development of skills in speaking, listening, reading, and writing Dutch. Includes systematic grammar review and the introduction to finer points of grammar and idiomatic use of the language. Cultural topics are explored through film and short literary texts. Prerequisite: Dutch 102 or permission of the instructor.

**202 Intermediate Dutch II** (4). S. A continuation of Dutch 201. Further development of skills in speaking, listening, reading, and writing Dutch. Ongoing mastery of grammar and idiomatic use of the language. Cultural topics are explored through film and short literary texts. Completion of this course satisfies the foreign language core requirement.

305 **Dutch Literature I** (3). Study and discussion of several Dutch literary texts representative of the classical and modern periods of Dutch literature. Offered based on demand. See department chair.

306 **Dutch Literature II** (3). A continuation of Dutch 305. Offered based on demand. See department chair.

309 **Netherlandic Civilization** (3). A study conducted in the English language of several important aspects of Netherlandic civilization: Literature, history, religion, art, architecture, social structure, and education. Offered based on demand. See department chair.

## Economics

*Professors A. Abadeer, R. Hoksbergen, K. Schaefer (chair), E. Van Der Heide, S. Vander Linde*  
*Assistant Professor B. Haney*

The department has structured its major areas of study so that students may design programs that best prepare them for their chosen careers. It offers a primary major leading to a Bachelor of Arts in Economics. With the help of an academic advisor, students may choose to focus the economics major to prepare for careers in business, finance, law, international economics, public policy, international development, and graduate work in a variety of areas.

The department also offers the following four group majors: economics and the social sciences, economics and mathematics, secondary education social sciences, and elementary education social sciences. Group majors must form a coherent, planned program approved by an academic advisor.

The department offers economics minors that serve a variety of student interests: a general minor for students interested in economics, and more specific minors for students interested in many of the concentrations in the business curriculum (finance, human resources, marketing, and operations management), or in international studies, public policy, teacher education, or quantitative analysis.

Honors work is encouraged in any department course by arrangement with the professor for the course. To graduate with honors in economics, discuss the requirements with the department chair or an economics academic advisor.

One interim course may serve as an elective for any major or minor in the department if it is designated as an elective by the department. This designation appears in the Interim Catalog course description.

Prerequisite for admission to the economics majors or minors is a minimum grade of C (2.0) in Economics 221.

The Societal Structures in North America core area is met by Economics 151, 221, 232, 233, or 241; Global and Historical Studies core is met by Economics 236, 237, or 337; and the Integrative Studies core requirement is met by Economics 395.

## **ECONOMICS MAJOR**

(35-37 semester hours)

Economics 221

Economics 222

Economics 325

Economics 326

Economics 343

Economics 345

Economics 395

Two additional electives from Economics 330-339

Two additional electives from economics or business courses

### **Cognates**

(9 semester hours)

One from Statistics 143, 243, or 343-344

Mathematics 132 or 171

Information Systems 171

## **ECONOMICS MINOR**

(19-20 semester hours)

Economics 221

Economics 222

Economics 325 or 326

Three from Economics 232-345, including at least one 300-level course

Students are encouraged to organize their elective courses for the economics minor, after taking Economics 221 and 222, according to their area of academic interest as follows:

Finance: Economics 326 and three from 331, 338, 339, 343, 345

Human Resources: Economics 325 and three from 326, 241, 232, 330, 335 or 345

International and Global Study: Economics 325 or 326 and three from 237, 331, 337, 338, 345

Marketing: Economics 325 and three from 241, 330, 334, 345

MBA Preparation: Economics 325, 326, 343 and one from 241-345

Operations Management: Economics 325, 343 and two from 232, 326, 330, 334, 339, 345

Public Administration and Policy: Economics 325 or 326 and three from 232, 241, 330, 335, 339

Quantitative Analysis: Economics 325, 326, 343, and 345

Small Business: Economics 325 or 326, and three from 232, 241, 330, 331 or 335

Two of the courses in this minor may count toward both the economics minor and most other majors, including the business major.

## **SOCIAL SCIENCE GROUP MAJOR— ECONOMICS EMPHASIS**

(34-37 semester hours)

Economics 221

Economics 222

One from Economics 325-326

Two from Economics 325-345

Four courses from one of the social sciences (sociology, psychology, political science or history)

Two electives from economics and/or business

### **Cognates**

(6-9 semester hours)

Statistics 143, 243 or 343-344

Information Systems 171

One from Information Systems 151, 153, 221, 141, 271 or Computer Science 104, 108 or 112

## **MATHEMATICS/ECONOMICS GROUP MAJOR**

See the specific requirements in the Mathematics and Statistics Department section of the catalog.

## **SECONDARY EDUCATION ECONOMICS MINOR**

(21 semester hours)

Economics 221

Economics 222

Economics 338

Economics 339

IDIS 375

Six additional semester hours from within the department. One advisor-approved interim may be included

## **SECONDARY EDUCATION SOCIAL STUDIES GROUP MAJOR**

(40 semester hours)

Economics 221

Economics 222

Geography 110

Environmental Studies 210

History 151

History 152

History 229

Political Science 101

Political Science 202

Interdisciplinary 205  
 Interdisciplinary 375  
 History 359

Students pursuing the secondary education social studies major must also complete a history major or a minor in economics, geography, or political science. Courses are allowed to overlap between this major and the disciplinary major or minor.

## SOCIAL STUDIES ELEMENTARY

### GROUP MAJOR

(39 semester hours)

Economics 221

Economics 222

Geography 243

History 151

History 152

History 229

Political Science 101

Political Science 202

Interdisciplinary 205

Education 305

One from Economics 237, 330, Geography 230, 242, History 338, 356, Political Science 207 or 272

One advisor approved Geography elective

### COURSES (ECON)

151 **Principles of Economics** (3). F, S. The institutions of the North American market economy are studied, examining the determinants of resource allocation, income distribution, prices, production, income and employment levels, and economic growth. Topics include international economic relations and the role of government in the economy. Students intending to major or minor in economics or business should not take this course, but should take Economics 221 to satisfy this core requirement.

221 **Principles of Microeconomics** (3). F, S. This course involves a study of the institutions of mixed-market economies such as those of North America, their role in resource allocation, and the determination of prices, outputs, and income distribution. Topics include the role of the government in the economy and environmental impact of economic activity.

221H **Principles of Microeconomics** (0). F. The one hour per week honors section

of “Principles of Microeconomics” is taken concurrently with a three hour section of Econ 221. The honors section will involve readings on current microeconomic topics (e.g., education policy, environmental policy, tax policy, health care policy, and economic justice), discussion of those readings, presentations by several economics faculty, and a guided research project on a topic of the student’s choice. Enrollment in honors Economics 221 is limited to 20 students.

222 **Principles of Macroeconomics** (3). F, S. A continuation of Economics 221. A study and evaluation of the determination of national income, including analysis of consumer spending and saving patterns, business investment, government spending, taxation, monetary policy, unemployment, and inflation. The course includes an introduction to international trade and finance. Prerequisite: Economics 221.

222H **Honors Macroeconomics Seminar** (0).

232 **Sustainability Economics** (3). S. A study of environmental problems in relationship to Christian stewardship, sustainability, economic efficiency, and justice. Topics include balancing economic activity and environmental impact; measurement of the costs and benefits of environmental policies; and design and evaluation of public policies and business practices to address these problems. No prerequisite.

236 **Emerging Economies** (3). F. This course examines the economies of key emerging nations: China, India, Brazil, and Indonesia. The course will start with an overview of the global economy and the international financial system. Students will consider how legal, technological, political, and cultural environments influence economic and business relations between countries. The benefits of trade, national trade policies and international cooperation will all be explored. Each of the four emerging nations will be examined within this broad context, focusing on relevant economic history, transition to a market-oriented economy, current institutions, opportunities, and challenges. Prerequisite: Economics 151 or 221 and 222. (Economics 222 may be taken concurrently with this course.) This course satisfies requirements for the global and historical studies core category.



**237 Regional Economies of the World** (3). S. This course focuses on the economies of a particular region of the world. African, Asian and Latin American economies are studied on a rotating basis. The course begins with a study of basic differences in economic systems and institutions of modern economies. These concepts are then applied to more detailed historical study of a number of key regional economies. The possibility of a distinct regional development model is considered. This course satisfies the global and historical studies core requirement if a student has previously taken a world history class. Prerequisite: Economics 221 and 222 or Economics 151.

**241 Health Economics and Health Policy** (3). F. An introduction to economics in the context of a study of health economics and health policy, with detailed focus on the U.S. health care system. The intent of the course is to develop an understanding of economic principles that can be used with other criteria to evaluate the historical and future direction of the U.S. health care system. Topics include efficiency and equity of resource allocation, ethical perspectives on health care access, history and current direction of U.S. and international health care policy, and the development and evolution of insurance, hospital and health care provider markets. This course is recommended for students seeking a professional career in health care management, human resources, medicine, mental health professions, nursing, public health or public policy. Not open to first-year students.

**325 Managerial Economics/Intermediate Microeconomics** (4). F. An intermediate-level study of microeconomic theory including applications to managerial decision-making in such areas as market and risk analysis, demand forecasting, production and cost analysis, product pricing, profit planning, and consumer theory. Goals of firms and the use of economic theory in achieving them are examined and evaluated. Calculus concepts used in the course will be taught as part of the course. Prerequisites: Economics 221, Information Systems 171, and Statistics 143, 243, or 343.

**326 Business Cycles and Forecasting/Intermediate Macroeconomics** (4). S. An intermediate-level study of macroeconomic

theory emphasizing modeling and analysis of general business activity and the implications of changing business conditions for business planning and public policy. Computer lab work is used to understand the implications of economic policy. Prerequisites: Economics 221 and 222, Information Systems 171, and Statistics 143, 243, or 343.

**330 Urban Growth and Development** (3). F. This course introduces students to the forces behind the economic growth and development of urban areas around the world. The class examines how economists measure the quality of life of an urban area and what the likely economic features of city and suburban life will be in the coming decades. Students will critique urban economic policies by examining how they affect resilience, sustainability, and prosperity. Students will also explore to what extent Christians might affirm or object to the way in which urban economic forces and public policies generate economic growth, affect ecological systems, and distribute goods and services across race, social class, and future generations. Prerequisites: Economics 151, or Economics 221 and 222, or Economics 232, or permission of the instructor. Not offered 2015-16.

**331 Money and Financial Markets** (3). S. A study of the principles of money, banking, and credit with emphasis on monetary theory and policy and their role in domestic and international economics. Prerequisite: Economics 221 and 222.

**334 Competition and Market Performance** (3). A study and evaluation of business strategies in imperfectly competitive markets, including entry barriers, pricing, product differentiation, vertical integration, and mergers. Examination of relevant public policies, such as antitrust law and utility regulation. Prerequisite: Economics 221 and 222. Not offered 2015-16.

**335 Human Resource Economics** (3). F. A study of labor markets and their relationship to the economy as a whole, including labor-force participation, human-capital formation, wage theory, discrimination, unemployment, income distribution, labor unions, and related public policies. Prerequisite: Economics 221 and 222.

**337 World Poverty and Economic Development** (3). F A study of the characteristics of poor nations in many regions of the world, and of factors that cause and influence economic development within countries. After examining conditions within poor nations, students analyze theories of economic growth and economic development. Subsequently, the course investigates differences and similarities in human and capital resource endowments, production, and trade relations. Problems, possibilities, and policies are analyzed in each of these topic areas. Prerequisites: Economics 221 and 222.

**338 International Trade and Finance** (3). S. A study of international economic relations, stressing the fundamentals of international trade and international finance theories, the balance of payments, problems of international disequilibrium, trade barriers, and efforts to promote international economic stability and growth. Prerequisite: Economics 221 and 222.

**339 Government Finance and Public Policy** (3). S. A study of the economic effects of government spending and taxation on resource allocation and on the distribution of income. Students analyze the economic role of government, and current policy issues and the political process regarding taxation and government spending. Prerequisite: Economics 221 and 222.

**343 Research Methods** (3). F An introduction to econometrics, the use of advanced statistics to investigate economic and business questions. Emphasis on evaluating the quality of available information, developing

theory-directed models, conducting original research, and interpreting and critically evaluating the published work of others. Topics include the classical linear regression model, heteroskedastic and autocorrelated disturbance models, specification testing, simultaneous-equations and time-series models, selection and VAR models. Students learn to program in a popular statistical language (STATA). Calculus concepts used in the course will be taught as part of the course. Prerequisite: Statistics 143 or its equivalent.

**345 Advanced Topics in Economics** (3). S. This course builds on Economics 325 and 326 to provide a deeper, more comprehensive understanding of microeconomic and macroeconomic theory. Topics include game theory, the economics of information and uncertainty, general equilibrium, open economy growth models, international interrelationships, and inter-temporal decision-making. Prerequisites: Economics 325, 326, and the major's statistics and calculus cognates.

**390 Independent Study.** F, I, and S. Prerequisite: Permission of the department chair.

**395 Economics Seminar** (3). S. This seminar course considers the history of economic thought during the last two millennia. This involves a careful consideration of major historical schools of thought about economic culture, beginning with the classical civilizations and ending with contemporary methodological approaches to economics. Prerequisites: Senior economics major status, Biblical Foundations I or Theological Foundations I, Developing a Christian Mind, and Philosophical Foundations.

# Education

Professors A. Boerema, C. Joldersma, R. Keeley, J. Kuyvenhoven, J. Rooks, R. Sjoerdsma (chair),  
D. Smith

Associate Professor D. Buursma

Assistant Professors K. Sevensma, P. Stegink, M. Terpstra, S. Verwys, J. Walcott, N. Westbrook

## Undergraduate Teacher Education Program

In Michigan, teachers are generally certified to teach at the elementary (K-8) or secondary (6-12) level. There are a few specialty areas in which students can be certified to teach in grades K-12 (e.g. art, world languages, music, physical education, and special education). All teacher education students are required to complete a liberal arts core and a series of education courses. In addition, students are required to complete a major or two minors as detailed in the Teacher Education Program Guidebook.

Since teacher education students have a complex and comprehensive preparation program, they should seek assistance in choosing appropriate courses as early as possible. Students who are interested in teacher education should inform the office of academic services so that they can be assigned to an advisor who is knowledgeable about education program requirements. Since some core courses are designed in particular for education students, programs must be carefully planned. It is especially important for students who are considering endorsements in special education, early childhood education, bilingual education, or English as a second language to work with the advisor in their specialty area early in their programs.

The undergraduate teacher education program is described in detail in the Teacher Education Program Guidebook, which is available on the Education Department's website. The Guidebook includes specialized core requirements, criteria for admission to the teacher education program, criteria for admission to directed teaching (the full-time student teaching semester) and requirements for teacher certification. Normally, students apply to be admitted into the teacher education program during their sophomore year. Education course requirements are described in this section of the catalog. Major and minor requirements are described under the appropriate department. The specialty area majors and minors offered are listed below. Note that group majors and minors are associated with multiple departments. Practicum experiences for Education 202, 303, 307, 322, 326, 330, 343, 344, 345, 346, and 347 occur at a variety of sites in the greater Grand Rapids area. Students are responsible for their own transportation to those settings. Students may be able to arrange a car pool or use the city bus line.

## Post Baccalaureate Non-Degree Program Leading to a Michigan Provisional Teacher Certificate

This program is designed for students who have graduated with a bachelor's degree from an accredited institution without having obtained a teaching certificate. To be eligible for this program, students must have a grade point average of 2.5 or above and two letters of recommendation. Students must complete the required courses in the education sequence for elementary or secondary certification including a semester-long directed teaching experience. Certification requirements for specialty area majors and minors (including successful completion of state certification tests) must also be met. Only courses in which a grade of C- or higher is earned can be used to meet program requirements. Requests for admission to this program should be addressed to the Education Department.

## MAJOR AND MINOR EDUCATION CONCENTRATIONS

Some of these majors and minors are available for K-12, secondary, or elementary only. See the department's section of the catalog to determine the certification levels available and to obtain a list of required courses for these majors and minors.

Art  
 Bilingual Spanish  
 Biology  
 Chemistry  
 Chinese  
 Communication arts and sciences  
 Computer science  
 Early childhood education (see education)  
 Earth/space science (see geology)  
 Economics  
 English  
 English as a second language  
 Fine arts group (see art, music or communication arts and sciences)  
 French  
 Geography  
 German  
 Health education (see kinesiology)  
 History  
 Integrated science (see science education studies)  
 Language arts group (see English or communication arts and sciences)  
 Latin (see classical languages)  
 Mathematics  
 Music  
 Physical education (see kinesiology)  
 Physics  
 Political science  
 Psychology  
 Religion  
 Social studies group (see history, economics, political science or geography)  
 Sociology  
 Spanish  
 Special education—cognitive impairment

A comprehensive list of departmental advisors for each concentration can be found in the Teacher Education Program Guidebook.

### **ELEMENTARY EDUCATION MAJOR AND PROFESSIONAL COURSES (many meet core requirements)**

(84-85 semester hours)

CAS 214  
 Geography 243  
 History 151 or 152  
 English 101  
 English 340 or 341  
 Education 102  
 Education 202  
 Education 210  
 Education 302  
 Education 303  
 Education 305  
 Education 309  
 Education 322  
 Education 326  
 Education 345  
 Education 398  
 Interdisciplinary 110  
 Interdisciplinary 205  
 Kinesiology 223  
 Science Education Studies 121  
 Science Education Studies 122  
 Science Education Studies 312 or 313  
 Mathematics 221  
 Mathematics 222  
 Mathematics 323  
 PER 101-112  
 Physical Education 150

### **SECONDARY EDUCATION COURSES**

(32 semester hours)

Education 102  
 Education 202  
 Education 302  
 Education 303  
 Education 307  
 Education 346  
 Education 398  
 Interdisciplinary 205

### **SPECIAL EDUCATION MAJOR (COGNITIVE IMPAIRMENT)**

(38 semester hours)

Education 202  
 Biology 115  
 Psychology 151  
 Psychology 201  
 Education 306  
 Education 310  
 Education 312  
 Education 330  
 Education 347

The advisor for this program is P. Stegink

## EARLY CHILDHOOD MAJOR

(31 semester hours)

Education 202

Education 236

Education 238

Sociology 304

Speech Pathology and Audiology 311

Education 312

Education 335

Education 337

Education 339

Education 343

The advisor for this program is S. Verwys.

## UNDERGRADUATE COURSES (EDUC)

**102 Introduction to Education** (1). F, S. This course serves as an introduction to the discipline of education and the teaching profession. As such, it provides the initial framework for subsequent education courses, introducing students to pedagogy and its empirical basis, to issues of curriculum and standards, and to the organization of schools in the United States and beyond. The course affords students the opportunity to relate theory to practice as a companion field experience is a required component of the course. This course must be satisfactorily completed as a condition of program admission.

**202 The Learner in the Educational Context: Development and Diversity** (3). F, S. This course will help students develop insight into the development of the mind, identity, and perspective of all learners, including multiple domains of diversity and many alternate ways of being, doing, and seeing, including what is typically labeled as “exceptionality.” Students will explore and analyze psychological, physical, social, culture and moral/spiritual facets of development as well as their interplay with the social environment of the learner and their impacts in the classroom. Through lectures, readings, class assignments, a service-learning experience, and a case study, the class will examine psychological, educational, biological, and socio-cultural theory through the lens of a reformed Christian perspective. There is a fifteen hour outside of class field placement required as part of this course. This course must be satisfactorily completed as a condition of program admission. Prerequisite: completion of Education 102.

**210 Music and Art in the Elementary Classroom** (3). F, S. This is a required course for the elementary teacher candidate. It covers seven weeks of music education methods and seven weeks of visual arts methods. Integration of music and art with other subject areas will be stressed. Prerequisite: Education 102 or concurrent enrollment in Education 102.

**236 The Young Child in an Educational Setting** (3). F. A review and critique of the basic theories of child development. Observation and intensive analysis of the development of a particular child in a preschool setting as related to the major theories and to the appropriate facilitation of development.

**238 Developmentally Appropriate Practice with Young Children** (3). S. Work with young children requires specialized knowledge of the field of early childhood education. Education 238 will equip students with knowledge and skills for developmentally appropriate practice for young children. This course includes anti-bias perspectives, pedagogical strategies including the importance of play in learning, classroom management, the use of technology with young children and reflection on practice. A one hr. practicum during the P-12 school day will be included.

**302 Curriculum and Instruction for Diverse Learners** (4). F, S. This course will help students develop an increased understanding of the complex issues surrounding learning theory and its impact on instruction in diverse educational contexts. Students will explore how an understanding of the learner, the curriculum, and the context shape instructional practice. They will learn how to engage in a pedagogical cycle that includes planning, implementation, evaluation, and reflection with a focus on meeting the needs of all learners. Students will also explore ways in which new teachers can develop and maintain a transformative vision. All of these areas will be examined through the lens of a reformed Christian perspective. An extensive practicum will assist students in linking theory and practice in a classroom setting. Prerequisites: Education 102, 202, admission to the teacher education program. (See the *Teacher Education Guidebook* for admission requirements.) Must be taken concurrently with Education 303.

**303 Curriculum and Instruction: Practicum** (3). F, S. Must be taken concurrently with Education 302. See description above.

**305 Teaching Social Studies in the Elementary and Middle School** (2). F, S. A study of perspectives, content, methods, and materials in teaching the social studies in the elementary school. Students will analyze perspectives and determine major goals and themes for teaching the social studies. They will study and analyze the contributions of the various disciplines to the social studies curriculum. Students will examine materials and learn and practice methods for teaching the social studies. Biblical principles, which offer direction for human interactions in society, will be considered. Prerequisites: Education 302/303 or permission of the instructor.

**306 Introduction to Cognitive Impairment** (3). F, A comprehensive study of the characteristics of persons who have an intellectual disability. Historical and contemporary perspectives on mental retardation will be explored, as will common causes, definitional issues, and interventions. While special attention is given to the needs of persons with retardation as learners, the course examines the entire lifespan and functioning in a variety of settings besides the school, such as the church, workplace, and neighborhood. A Christian view of persons, community, and discipleship, along with the concept of normalization/social role valorization, are integrating elements in the course. Prerequisite: Education 202 or permission of the instructor.

**307 Reading/Literacy in the Content Area** (3). F, S. This course examines the nature and function of literacy in the secondary curriculum. Specifically this course will examine the reading and writing practices that support the ways of knowing and doing characteristic of secondary school subject areas. The course will include: analysis of the factors which affect comprehension and composition of content area materials, examining pedagogical strategies that support diagnosis as well as instruction in the literacy skills common to all content areas, strategies for supporting full participation and inclusion of students who display the wide range of ability found in the average secondary classroom, exploring the relationship between discipline based inquiry, literacy development,

and educational goals and practices. There is a field placement component as part of this class that is outside the normal class meeting time, during the local secondary school days. Prerequisites: Education 302/303 or permission of the department chair.

**309 Teaching Religion to Children and Adolescents** (2). F, S. A study of perspectives, content, methods, and materials in teaching religion to children and adolescents. This includes pedagogy appropriate for public and non-public schools and other settings and evaluation of methods and materials. Prerequisites: Education 302/303, permission of the instructor or declaration of ministry leadership minor.

**310 Assessment in Cognitive Impairment** (3). S. A study of the foundational concepts and basic terminology needed to assess students with intellectual disability. Skill will be developed in selecting, administering, and interpreting both formal and in-formal, norm-referenced as well as criterion referenced and curriculum-based assessment instruments, for the purpose of developing individualized educational plans. Corequisite: Education 347.

**311 Child Language Development** (3). See Speech Pathology and Audiology 311.

**312 Teaching Exceptional Students** (3). S. This course provides in-depth study of the characteristics of students who are labeled in school as having a disability and who may require a variety of learning supports. It includes study of laws and court decisions, the history of special education, alternative educational arrangements, individualized planning, current issues, and new pedagogical directions in serving exceptional learners in public and private schools. Throughout, a Christian view of persons will be developed that counteracts deficit thinking, recognizes the value and gifts of those who may have been given labels, sees human difference as asset, and fosters interdependence. Twelve hours will be spent outside of class during the K-12 school day in observation and critique of school programs that support learners with disabilities.

**322 Introduction to Methods of Teaching Reading: Elementary** (3). F, S. A study of reading theory and reading research, the nature of early reading acquisition, and instructional strategies in language arts for K-8. The teacher candidates are involved in extensive

tutoring and interactions in the school that help them understand how children's cultural and cognitive development influence their learning and how reading and writing are foundational to all learning. May be taken concurrently with Education 302-303.

**326 Reading/Language Arts in the Elementary School** (3). F, S. This course will present reading as a language art and demonstrate the relationship of language arts to the various subjects in the elementary school. Students will learn strategies and techniques for assessing and differentiating instruction to meet the wide range of reading and writing levels found in elementary classrooms. Prerequisite: Education 322 or permission of the instructor.

**330 Curriculum and Instruction: Cognitive Impairment** (4). F. A study of the various curricula, instructional materials, and teaching methods appropriate for learners who have mental impairments. Research-based general principles of instruction are reviewed as well as specific methods for teaching domestic, vocational, community living, recreation/leisure, and functional academic skills. Strategies are learned for generating curriculum, evaluating published curricula, and for developing individualized education programs. Includes a practicum of two half-days per week in local school programs serving students with cognitive impairment. Prerequisites: Education 202, 302/303, and 306 or permission of the instructor.

**335 Assessment of the Young Child** (3). S. This course prepares the early childhood professional to recognize and thoughtfully create and administer developmentally appropriate assessment strategies. Informal and formal assessment strategies including standardized assessments will be regarded. Students will observe and participate in developmentally appropriate assessment in early childhood classrooms. Other topics include assessment recording and reporting, referrals to community agencies using assessment data for curricular planning, and advocacy for practice that does not harm children. Prerequisites: Education 302/303 or permission of the instructor.

**337 Curriculum Theory and Development: Early Childhood Education** (3). F. An evaluation of the major approaches to development

of a curriculum for early childhood education (up to age eight), the underlying assumptions of each approach, and the appropriateness of each approach for children. Included is a model for curriculum development and opportunity to implement the model for early education. Prerequisites: Education 302/303 or permission of the instructor.

**339 The Early Childhood Professional** (3). F. This course examines the knowledge and skills required to become an educator who identifies as a Christian early childhood professional, who can administer programs, who understands and works with children and families from diverse backgrounds, who can recognize and report child abuse and neglect, who is a strong advocate for children and families and who is a reflective practitioner committed to life-long learning. Prerequisites: Education 302/303 or permission of the instructor.

**343 Early Childhood Education: Preschool Field Experience** (4). I. A field experience in a preschool setting that meets state requirements for the endorsement. Provides for analysis of teaching methods, materials, and classroom organization as they relate to the early childhood setting. Prerequisites: Education 236, 337, 339, and Sociology 304.

**345 Directed Teaching: Elementary** (12). F, S. Students participate in a full-time supervised student teaching experience. Prerequisites: GPA of 2.5, passing scores on the reading, mathematics, and writing competency tests, completion of education courses, and appropriate recommendations from the education and major/minor departments. See the *Teacher Education Program Guidebook* for additional requirements. Includes a weekly seminar.

**346 Directed Teaching: Secondary** (12). Students participate in a full-time supervised student teaching experience in their major. Secondary history and physical education students student teach during the fall or spring semester. Secondary mathematics and science students (all of the sciences) student teach only during the fall semester. All other secondary students student teach during the spring semester. Prerequisites: GPA of 2.5, passing scores on the reading, mathematics, and writing competency tests, completion of education courses, appropriate recommen-

dations from the education and major/minor departments, and concurrent enrollment in a departmental 359 Seminar. See the *Teacher Education Program Guidebook* for additional requirements.

**347 Directed Teaching: Cognitive Impairment** (12). S. Full-time, supervised student teaching in a school program serving students with mild or moderate levels of cognitive impairment. A minimum of ten weeks, including at least 360 clock hours of observation and participation, is required. Includes a bi-weekly seminar, which engages students in critical reflection on their experience in applying theory to practice in the student teaching context. Prerequisites: Good standing in the teacher education program, passing scores on the reading, mathematics, and writing competency tests, completion of all required education courses, and appropriate recommendations. See the *Teacher Education Program Guidebook* for additional requirements.

**398 Integrative Seminar: Intellectual Foundations of Education** (3). F, S. In this course students examine education in its context as a life practice. It involves inquiry into and critique of the philosophical assumptions, historical developments, and social settings that shape the beliefs and practices informing schools as social institutions and education as cultural practice. Throughout the course, students are completing their own faith-based philosophy of education. Prerequisites: junior or senior standing, Education 302/303, Biblical Foundations I or Theological Foundations I, Developing a Christian Mind, and Philosophical Foundations.

**390 Independent Study** (3). F, I, and S. Prerequisite: permission of the department chair.

**IDIS 205 Societal Structures and Education** (3). F, S. An examination of the interaction between education and the other systems and institutions (e.g., political, economic, and cultural) that shape society. This course will examine how education is shaped by and is reshaping these systems and institutions. Particular attention will be given to the impact of race, class, and gender on schooling and society. Community-based research projects will challenge students to examine these issues in real-life contexts as

well as introducing them to social science research methodology. Christian norms, such as social justice, will shape this critical analysis of the interaction between education and society. This class is appropriate for all students who are interested in education and society and meets a core requirement in the societal structures category.

## GRADUATE STUDIES IN EDUCATION PROGRAM

Calvin College offers a Master of Education (MEd) program with concentrations in curriculum and instruction, educational leadership, inclusion, and literacy. In addition, post-baccalaureate, non-degree programs are available for obtaining the Michigan Professional Teaching Certificate (6 hours of coursework beyond initial certification) and state endorsements for specialized areas of education.

### Master of Education Degree

The Master of Education (MEd) program serves elementary and secondary teachers and administrators who want advanced professional development. It enables teachers and administrators to satisfy requirements for continuing certification or additional endorsements. Calvin's MEd is designed especially for educators who are already certified and experienced in classroom teaching or administration and who wish to attend a Christian college where academic excellence is pursued in the light of Christian commitment. The MEd provides college graduates with an opportunity to integrate an authentic Christian perspective with a broader, deeper range of knowledge and insight into the professional role of the teacher or administrator. Requirements for admission to the program, transfer of credit, and degree requirements are described in detail in the Graduate Studies in Education handbook, which can be obtained online from the graduate program's website. Students who wish to learn more about specific specialty areas in the MEd program should meet with one of the following advisors: J. Walcott, curriculum and instruction, A. Boerema, educational leadership, D. Buursma, learning disabilities, or J. Kuyvenhoven, literacy.

### Endorsement Program



The Endorsement Program at Calvin allows certified teachers to fulfill the requirements of the Michigan Professional Teaching Certificate, gain highly qualified status, or obtain additional expertise in a specialty area. The state of Michigan requires a minimum of 6 semester hours of coursework (or other professional development) beyond initial certification, including EDUC 542 Diagnosis and Remediation of Literacy Difficulties, and 3 years of successful teaching experience before a teacher can be recommended for a Professional Teaching Certificate. The state regulations for highly qualified status are available in the Education Department from Shari Brouwer. The Endorsement Program allows participants to add a level of teaching certification to their certificate (e.g. elementary to a secondary certificate) or to add a subject endorsement to their certificate. Calvin offers endorsements in early childhood, English as a second language, cognitive impairment, reading specialist, and bilingual education, as well as every major and minor offered at the undergraduate level. Courses taken in this program may be transferable to a master's degree at a later time if they are applicable to a particular concentration.

Courses in the Endorsement Program must be chosen in consultation with an appropriate departmental advisor at the time the program is initiated. Students who graduated from and were recommended for the provisional certificate by Calvin must take at least 6 semester hours of the program at Calvin. All others must take at least 9 semester hours at Calvin. Previous course work, as well as planned selections, must be evaluated by the advisor. Only courses with a grade of C+ (2.3) or higher will be applied to program requirements. Also, students adding subject endorsements or elementary certification must pass the Michigan Test for Teacher Certification for those areas.

Requirements for admission to the program, transfer of credit, and degree requirements are described in detail in the *Graduate Studies in Education Handbook*, which can be obtained online on the graduate studies website.

#### MASTER'S IN EDUCATION

A typical program is 30–33 semester hours

EDUC 500 Introduction to Graduate

Studies in Education

EDUC 510 Framing Questions, Global

Forces, Constraining Structures

EDUC 514 Introduction to Educational

Research

EDUC 516 Leading Educational Communities

EDUC 522 Reshaping Curriculum, Teaching, and Learning

EDUC 542 Diagnosis and Remediation of Literacy Difficulties OR approved elective

EDUC 554 Pathways to Inclusion

EDUC 596 Specialized Literature Survey OR approved elective

Two further approved electives

Practicum (2 semester hours) if

specializing in Inclusive Education, Literacy, or Educational Leadership

CIW Current issues workshop

#### GRADUATE COURSES (EDUC)

**500 Introduction to Graduate Studies in Education** (1). F, S, SS, online, on campus, and hybrid. Graduate study requires a set of advanced academic skills. As such it is necessary to provide these basic skills to enable new graduate students to be successful. In this course students will be provided with the training in the basic tools of finding resources, reading and critiquing empirical literature, and academic writing. In addition students will be introduced to the nature and various approaches of educational research.

**510 Framing Questions, Global Forces, Constraining Structures** (3). S, online. This course will center on fundamental questions at the intersection of education, justice, and human flourishing. We will examine key issues surrounding the nature of a good society, the ways in which the global community affects education, and how schooling gets structured by politics and economics. This course will use the faith-based frames of justice and hope in connection with shalom and the kingdom of God to investigate formal education in light of its political, economic, social, and religious contexts. Students will investigate foundational questions around teaching, learning, curriculum, and language as well as structural issues of social class, gender, ability, and race. The aim is for students to articulate their own idea of the purpose of school framed in their own faith-based perspective. The course will leave space for students to explore specific interests and issues.

**514 Educational Research and Evaluation**

(3). F, online. Building on Education 500 Introduction to Graduate Studies in Education, this course engages students further in understanding and examining the theories, methods, and paradigmatic frames of educational research through a biblical lens. In addition, the course prepares students to use data appropriately to support educational and organizational decision-making. Students will learn how to read and critique qualitative and quantitative educational research and will learn how to use research and assessment data to make decisions related to the work of P-12 schools. Prerequisite: EDUC 500 Introduction to Graduate Studies.

**516 Leading Educational Communities: Communication** (3). On campus. Because communication is at the heart of teaching, learning and leading, the Graduate Studies Program prepares professional educators to understand and analyze discourse as it shapes educational activity. Teaching and learning communications are shaped and made meaningful by culture, language, mode and circumstance; as well as ideology and power. Abilities to analyze communication as discursive, prepares participants to examine educational activity settings, assess them for equitable participation and design them for more effective and just educational practice.

**522 Reshaping Curriculum, Teaching, and Learning** (3). On campus. The dynamic relationship between curriculum as content and as process, between what is to be learned and the instructional practices used to organize and mediate it for students, is at the heart of educational practice. This course focuses on the theory and practice of curriculum and pedagogy, examined in terms of both the perspectives that shape them and the ways in which they serve or fail to serve all learners. Issues addressed include the concept, purpose, and social context of curriculum; the historical perspectives that influence current and future directions; the relationship between curriculum and instruction; and the connection between perspectival commitments, curriculum, and instruction. The course will also address issues and practices related to assessment and instructional technology. Readings, discussions, interaction with practitioners, investigation, and application will form important activities in the development of an

understanding of and personal perspective on curriculum and instruction.

**530 Introduction to School Leadership** (3). SS, odd years. A study of leadership theory and practice relating to building school communities that promote learning for all students. This introductory course in school leadership will focus on: organizational and leadership theory, establishing a school mission, collaborative problem-solving and community building, decision-making skills and procedures, and personal leadership qualities. Special emphasis will be given to exploring biblical principles which guide Christian leaders in school settings.

**531 Professional Development and Supervision** (3). SS, even years. A study of the theory and practice related to the professional development of teachers and administrators at both the elementary and secondary levels. This course focuses on ways in which school leaders can structure professional development opportunities that promote student learning and school improvement. The course includes a study of adult learning theory, collaborative learning models, mentoring and coaching, formal and informal teacher assessment, and recruitment, induction, and retention of new teachers. Special emphasis will be given to biblical principles which help shape professional communities in schools.

**532 School Business Management** (3). S, online, odd years. In this course students will study principles and methods of planning and fiscal management that are based on a biblical model of stewardship. Topics include the process of funding (fund raising, tuition and fees), budgeting (including risk management), and organization. Prerequisites: Education 530 or permission of instructor.

**542 Diagnosis and Remediation of Literacy Difficulties** (3). F, S, online. This course meets the state literacy course requirements for professional certification. It is required as part of the Calvin graduate reading specialist endorsement and can be used as an elective in any of the other Calvin MEd programs. In this course, we consider the developmental, socio-cultural and cognitive aspects of literacy teaching with students of all ages. We review literacy practices including fiction, information and discipline specific texts,

special interest reading, and work place literacy. The course presents and critiques current positions from which literacy instruction is designed and delivered. It develops participants' pedagogy as they learn to assess a reader's abilities and develop instructional responses. Participants enhance their own critical literacy abilities as readers and writers of text. Course participants undertake a case study to complement the course readings, discussion and other learning. Course objectives are met through a deep engagement with a student who has been identified as an "at risk" reader based on classroom performance, ELL status or special education. This authentic engagement, facilitated by professional observations, assessments, and a responsive intervention, fully complements and activates course objectives.

**551 Assessment for Understanding: Learning Disabilities (4).** S. This course focuses on the knowledge and skills necessary to conduct comprehensive educational evaluations of the atypical learner and to use diagnostic data to construct instructional recommendations for students identified with learning disabilities. Students will gain experience administering, scoring, and interpreting a variety of formal diagnostic assessments as well as reading and writing educational reports. Supervised clinical experiences will provide opportunity to demonstrate understanding of and skill in assessment. Informal, non-standardized assessments and adaptations in standardized group assessments will also be explored. Prerequisites: Education 202, 606 and 550 or permission of the instructor.

**554 Pathways to Inclusion: Re-examining Beliefs about Learners (3).** Online, on campus, and hybrid. Schools and classrooms today reflect an amazing diversity of learners. In any learning community, educators must be prepared to create a learning community that meets the needs of students with a variety of differences in ability, gender, sexuality, race/ethnicity, language, socioeconomic status, and more. Yet the reality of developing just and inclusive educational communities is challenging. Through this course, participants are invited to embark on pathways to inclusion by examining the needs of learners with differences in school contexts. Participants will re-examine commonly held beliefs

and practices about identity and difference with the goal of developing inclusive learning communities. Readings and discussions will create opportunities that allow participants to consider how cognitive, socio-cultural, and critical perspectives are tools for thinking about shifting understandings of learners' differences. Learning excursions and projects will become spaces for integrating and applying new understandings about ourselves and others within teaching/learning practice. The course will specifically focus on linguistic differences, language development, and literacy as they support or impede the inclusion of all learners in educational contexts.

**557 Practicum Seminar: Learning Disabilities (3).** S, hybrid. This seminar accompanies the LD practicum experience bridging theory and developing reflective practice. Students will work as a community of practice to explore decision-making complexity in the design, implementation, reflection, and refining of instructional practice with students identified as "at risk" or with LD. Course components such as book club discussions, role-play, video analysis coupled with an action research inquiry structure support an emphasis on teaching communication, literacy, and thinking skills. Discussions and journaling will also address contextual and schooling issues encountered by a special education professional. Prerequisites: Education 202/606, 550, 552, 553, and 551.

**558 Practicum Field Placement: LD (2).** S, off campus. A teaching certificate endorsement in learning disabilities (LD) from the State of Michigan requires completion of a directed teaching experience with students identified with learning disabilities at either the elementary or secondary level. Practicum teachers who have not had prior supervised teaching experience in special education are required to complete a ten-week full-time supervised teaching experience working with a mentor teaching endorsed in LD. Those who are seeking a second endorsement in special education must complete a practicum with a minimum of 180 hours in an appropriate setting. Students not seeking endorsement will complete a field experience in a context most appropriate to their needs and professional goals. The practicum is taken concur-

rently with a seminar course, Education 557. The application for the practicum experience can be found on Calvin's graduate education website and must be completed by March 31 of preceding year.

596 **Specialized Literature Survey** (3). F, S and SS online, on campus, and hybrid. The purpose of this course is to provide students with the opportunity to deepen their

understanding of their chosen area of study and to specialize their focus through an extended program of reading guided by an instructor. Students will negotiate with their instructor a program of 2000 pages of reading (or equivalent) in their chosen area and evidence engagement with this literature through written and oral reports.

## Engineering

*Professors R. Brouwer, L. De Rooy (chair), G. Ermer, M. Heun, R. Hoeksema, E. Nielsen, J. A. Sykes, J. Jewett Van Antwerp, J. Van Antwerp, †S. VanderLeest, W. Wentzheimer, D. Wunder*

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Calvin College offers a Bachelor of Science in Engineering degree (BSE) with concentrations in chemical, civil and environmental, electrical and computer, and mechanical engineering. The engineering program is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org).

*Engineering (BSE)*

Engineering is a design-oriented profession applying the principles of mathematics, science, economics, ethics, social sciences, and humanities with judgment regarding the problem of sustainable utilization of energy and materials for the benefit of humanity. The recommended first semester curriculum is Chemistry 103, Mathematics 171, Engineering 101, 181 and English 101. Students interested in engineering should consult with the department chair.

### Mission of the Calvin College Engineering Department

#### Calling

The engineering program equips students to glorify God by meeting the needs of the world with responsible and caring engineering.

#### Distinctives

Our program is marked by these features:

- **Christian** — Integrating Christian faith into the curriculum as a foundation for understanding the role of technology in society and for forming engineers with a vocation of service to the world, including those who may be underserved
- **Interdisciplinary** — Emphasizing that today's complex problems require integration and analysis across engineering disciplines as well as the inclusion of liberal arts

context to inform engineering design decision-making, extend critical thinking, and advance communication skills

- **Student-Focused**—Creating a learning community that features small class sizes and a faculty committed to undergraduate teaching and mentoring
- **Practical**—Infusing the classroom with real-world engineering experience, challenging students to address open-ended design problems with multiple constraints in a team environment, and facilitating internships for students
- **Sustainable**—Advocating a thoughtful framework for technological development that stewards the resources of the world to enable the long term flourishing of human and non-human aspects of God's creation
- **Global**—Sponsoring opportunities to prepare graduates for participation in the international marketplace and involvement in addressing the challenges faced by people in the developing world
- **Innovative**—Encouraging the cultivation of an entrepreneurial mindset, business acumen, and the leadership and life-long learning skills that contribute to the growth of enterprises that build communities

### Educational Objectives

The BSE degree from Calvin College is designed to provide a foundation for productive engineering work in God's world. The objectives of the program are that recent graduates will

- apply and develop the basic principles and skills necessary for engineering (including mathematics, the sciences, business and the humanities) for appropriate assessment and analysis of current and complex problems.
- creatively generate innovative solutions to problems and move them toward successful implementation.
- contribute and communicate ideas successfully in multidisciplinary environments, exhibiting awareness of cultural context and team dynamics.
- demonstrate commitment to social responsibility, sustainability, and the continued learning necessary to address the pressing problems of our contemporary world.

The long term goal is for our graduates to become kingdom servants whose faith leads them to lives of integrity and excellence, called to leadership with a prophetic voice advocating for appropriate technologies.

The engineering program has a strong emphasis on design. Here the student meets the challenging value and technical issues that arise when societal problems are dealt with through technology. The design experience starts with several projects in the first two years, which focus on societal problems and issues such as sustainability, and which emphasize conceptual design, creativity, and teamwork. Design experiences are then integrated into each concentration by way of specific courses or projects. Finally, the design experience is completed by means of a capstone design project course sequence during the senior year. Within this design perspective, students are aided in the development of a thorough Christian understanding of technology and its applications.

Each of the four concentrations in the engineering program has two or three major themes or emphases. The chemical engineering concentration has emphases of chemistry and chemical processing. The civil and environmental engineering concentration has emphases of hydraulics, structures, and environmental. The electrical and computer engineering concentration has emphases of digital systems and analog circuits. Finally, the mechanical engineering concentration has emphases of thermal systems and machine design.

The curriculum described above is designed so that students will achieve the following outcomes. Calvin's engineering program will demonstrate that its graduates have:

- (a) An ability to apply knowledge of mathematics, science, and engineering,
- (b) An ability to design and conduct experiments, as well as analyze and interpret data to extract meaning,

- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability, and to produce a prototype or model which can effectively test the basic principles of the design,
- (d) An ability to function on multi-disciplinary teams,
- (e) An ability to identify, formulate, and solve engineering problems using fundamental principles,
- (f) An understanding of professional and ethical responsibility from a Christian, holistic perspective,
- (g) An ability to communicate truthfully and effectively,
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context including an understanding of Christian stewardship of resources,
- (i) A recognition of the need for, and an ability to engage in life-long learning, to aid in the fulfillment of their calling,
- (j) Engaged contemporary issues demonstrating how their Christian faith relates to their profession,
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies, and
- (l) Significant exposure to the engineering profession.

### Model High School Program

- 4 years of mathematics, including at least pre-calculus (AP Calculus and then AP Statistics if possible)
- 4 years of science, including 1 year each of biology, chemistry, and physics
- 2 years of a foreign language
- 4 years of English
- CAD, drafting, or other industrial design courses are recommended
- Introduction to computer programming is recommended

### Admission

Regular Admission: Students follow a common program for the first two years. Late in the second year, they apply for admission to a concentration in the engineering program. The minimum requirements for admission to the program are:

- Completion of Chemistry 103, Computer Science 104 or 106 or 108, Mathematics 171, 172, 231, Mathematics 270 or 271, Physics 133 and 235 with a minimum grade of C–,
- Completion of Engineering Statistics (normally Statistics 241) with a minimum grade of C–, alternatively AP Statistics with a score of 4 or better, or Statistics 243 with a minimum grade of C–, or Statistics 343 and 344 with a grade of C– or better,
- Completion of Engineering 101, 106, 181, 202, 204, and 209 with a minimum grade of C–,
- Completion of 14 hours of the required humanities courses
- Submission of résumé with application for admission to concentration
- Credit for Engineering 295 Internship Workshop
- Have a minimum cumulative GPA of 2.30
- Credit for Engineering 294, Engineering Seminar

Students must apply for admission to a concentration in the engineering program during the semester in which they are completing the required courses listed above. Admission to a BSE concentration is required for a student to enter 300-level engineering courses.

### Conditional Admission

Conditional admission is available to assist certain students. Students who wish to take 300-level courses, but who have not completed the required courses with the stipulated

minimum grade and/or who have not achieved the minimum required cumulative grade point average may be given conditional admission to the program. Conditional admission is granted at the discretion of the department chair. Conditional admission is normally granted as long as students do not have more than 10 semester hours of course deficiencies and only if their cumulative grade point average is no less than 2.20. Furthermore, the student's GPA must be raised to no less than 2.30 and all course deficiencies must be removed within the period designated by the chair (normally not exceeding one year). Students who receive conditional admission and then fail to meet these conditions within the designated time period are not eligible to reapply for admission to the program at a later date. As an alternative to conditional admission, students may delay taking 300-level courses until they have met all requirements for regular admission to the program.

To maintain a student-focused program with acceptable student-faculty ratios in 300-level courses, the engineering department reserves the right to delay admission into an over-enrolled concentration if the student would require "academic conditional" status at the time of admission. Academic conditional admission is defined as failure to meet the first four criteria for regular admission as defined above (completion of Chemistry 103, Computer Science 104/106/108, Mathematics 170/171, 172, 231, 270/271, Statistics 241, Physics 133, 235, Engineering 101, 106, 181, 202, 204, 209, all with grades of C- or better), and/or failure to achieve the minimum required GPA of 2.30. Academic conditional students denied admission into their first-choice concentration have two options: a) waiting a year to re-apply (in the meantime completing all requirements for regular admission), or b) applying for admission to a different concentration that is not over-enrolled.

### **Transfer Student Admission**

Students wishing to transfer from another school should apply to the office of admissions. In general, transfer students must meet the same course requirements as students who begin their programs at Calvin. Courses completed with a grade below C (2.0) will not be accepted. Transfer students must arrange for an analysis of transcripts by the department chair well in advance of course advising. In addition, those who wish to take 300-level courses in their first semester at Calvin must:

- Have a 2.5 grade point average at their previous school.
- If requested, provide a letter from that school indicating that the student was in good academic and personal standing.
- Receive either conditional admission or regular admission or possibly special permission from the chair.

Calvin's engineering program emphasizes the integration of Christian faith and a professional engineering education. This integration takes place in many ways. For this reason, a student seeking a BSE degree from Calvin should be part of the program for the equivalent of no less than four semesters as a full-time student at Calvin. It is also stipulated that at least one non-technical course be taken for each semester at Calvin.

### **Graduating with Honors**

Those wishing to graduate with honors in engineering must meet the following requirements:

- Have a minimum cumulative GPA of 3.5 and a total of six honors courses (18 hours minimum) overall, including at least two honors courses outside the major, at least two honors courses in engineering (except Engineering 101, 181, 185, 285, 294, 337, 339, 340, 382, 385, 387, 390, and 394) with a minimum grade of A- (at least one of the engineering courses must be a 300-level course).
- Receive credit for Engineering 385: "Engineering Internship", or Engineering 387: "International Engineering Internship."

Since the Engineering Department does not regularly offer honors sections, the honors courses in engineering are taken by special arrangement with the course instructor

### **International Designation**

Students may receive an international designation (e.g., “BSE Mechanical Concentration, International Designation”) by completing two of the following three international engineering items: 1) interim course 2) summer program 3) international internship while demonstrating some ability to speak the language of their internship country.

Other procedures and activities may qualify for the international designation. For additional details, please contact the department Chair or the department Internship Coordinator.

### **Sustainability Designation**

Students may receive a sustainability designation (e.g., “BSE Mechanical Concentration, Sustainability Designation”) by completing all of the following: 1) Engineering 184 Sustainability Challenges, 2) a 3- or 4-semester hour sustainability-themed course, 3) Engineering 384 Analysis of Sustainability Engineering Systems, and 4) a sustainability-related practical experience such as a senior design project or internship. Contact the department Chair or the Program for Sustainability Engineering Director for a list of qualifying 3-4 semester-hour courses and additional details.

### **Notes Regarding Admission and Graduation**

All students must display a high degree of personal integrity to be recommended for admission. This is demanded by the nature of engineering as a profession. After admission to the engineering program the student must continue to make adequate progress toward fulfilling graduation requirements. A grade below C- in a 300-level engineering course is an example of inadequate progress, and will require repeating the course. A student's admission to the program will be revoked if the student fails to show adequate progress. If the grade for a repeated course does not improve, this will result in revocation of admission to the program. In addition to an overall, college-wide grade point average of 2.0, the student must obtain a grade point average of 2.3 in 300-level engineering courses completed at Calvin to be eligible to graduate.

### **Engineering Department Academic Honesty and Integrity Policy**

Because of the nature of the profession, honesty and integrity is expected of every engineer. With this, and especially in light of our common Christian commitment, instances of academic dishonesty will not be tolerated in the Engineering Program. As documented in the Calvin Engineering Department Academic Honesty and Integrity Policy (ED-AHIP), “engineering students at Calvin College are expected to learn and study with absolute integrity.” The ED-AHIP provides the framework for Engineering Department faculty to sanction dishonesty within the guidelines of Calvin's Code of Student Conduct. Copies of the ED-AHIP are available on the engineering website as well as the engineering department office. Any questions, comments, and concerns regarding ED-AHIP and its application are welcomed.

### **Notes Regarding an Interdisciplinary/Group Major**

Students may initiate an Interdisciplinary major with the Engineering Department. The Group major must be approved by the Engineering Department Chair and include a minimum of two 300-level engineering classes. Students must also provide a written rationale for the group major that specifies how the writing program requirement will be met. Students should also be aware that they must follow the liberal arts core and their degree will be either a Bachelor of Arts or Bachelor of Science degree (not a BSE degree).

### **Advisory Council and Professional Societies and Student Clubs**

The Engineering Department is served by an advisory board, the Calvin Engineering Advisory Council (CEAC), consisting of engineers from local industries, which meet semi-annually to review the program and give advice from an industrial perspective. The council is currently chaired by Mr. Ron Plaisier. Calvin Engineering Faculty are members of a wide range of professional societies. Calvin College has student chapters of ASCE, ASME and IEEE. Calvin also has student organizations for Women in Engineering, Engineering Unlimited, Chemistry & Engineering Club and The Renewable Energy Organization (REO).



## **BACHELOR OF SCIENCE IN ENGINEERING**

(26 semester hours)

Engineering 101  
Engineering 106  
Engineering 181  
Engineering 202  
Engineering 204  
Engineering 209  
Engineering 294  
Engineering 295  
Engineering 339  
Engineering 340  
Engineering 394

### **Technical Cognates**

(32 semester hours)

Business 357  
Chemistry 103  
One from Computer Science 104, 106, or  
108  
Mathematics 171  
Mathematics 172  
Mathematics 271  
Mathematics 231  
Mathematics 241  
Physics 133  
Physics 235

### **Humanities courses**

(31 semester hours)

Interdisciplinary 149  
Interdisciplinary 150  
English 101  
Health and fitness core  
History 151 or 152  
Philosophy 153  
Religion 121 or 131  
Economics 221 or 151  
Literature core  
The arts core  
Interdisciplinary 102 or 103 or Communi-  
cation Arts and Sciences 101  
Cross-cultural engagement  
One year of a foreign language (exemption  
for students with at least 2 years of high  
school foreign language with a C or bet-  
ter each term)

Students must meet the requirements  
of at least one of the four concentrations  
listed below:

## **CHEMICAL ENGINEERING CONCENTRATION-CHEMISTRY AND CHEMISTRY PROCESSING EMPHASIS**

(44 semester hours)

Engineering 303  
Engineering 312  
Engineering 330  
Engineering 331  
Engineering 335  
Engineering 337  
Engineering senior special topics interim  
Engineering 342  
Chemistry 261 and 262 or CHEM 253  
with CHEM 383/303 or CHEM 253  
with CHEM 383/323  
Chemistry 317  
Chemistry elective

## **CIVIL AND ENVIRONMENTAL ENGINEERING CONCENTRATION- HYDRAULICS, STRUCTURES AND ENVIRONMENTAL EMPHASIS**

(42 semester hours)

Engineering 305  
Engineering 306  
Engineering 319  
Engineering 320  
Engineering 326  
Engineering senior special topics interim  
Engineering elective  
At least two from Engineering 308, 321  
or 327  
Advanced mathematics/basic science elective  
Advanced mathematics/basic science/tech-  
nical/engineering elective

## **ELECTRICAL AND COMPUTER ENGINEERING CONCENTRATION- DIGITAL SYSTEMS AND ANALOG CIRCUITS EMPHASIS**

(42 semester hours)

Engineering 302  
Engineering 304  
Engineering 307  
Engineering 311  
Engineering 325  
Engineering 332  
Engineering elective  
Engineering senior special topics interim  
Advanced mathematics/basic science elective  
Advanced mathematics/basic science/tech-  
nical/engineering elective  
Computer science 112

**MECHANICAL ENGINEERING  
CONCENTRATION-THERMAL  
SYSTEMS AND MACHINE  
DESIGN EMPHASIS**

(42 semester hours)

Engineering 305

Engineering 319

Engineering 322

Engineering 324

Engineering 328

Engineering 333

Engineering 334

Engineering 382

Engineering senior special topics interim

Engineering elective

Advanced mathematics/basic science elective

Advanced mathematics/basic science/technical/engineering elective

Group majors combining Engineering and another discipline (but not accredited by ABET) may be appropriate for some students (see the chair for more information).

**ENGINEERING MINOR**

The engineering minor consists of at least 22 semester hours of engineering courses. It must include at least two 300-level engineering courses, one of which must be a design course from the following list (arranged by concentration and track):

Chemical: Engineering 331 (Reactors) or 335 (Separations)

Civil & environmental: Engineering 308 (Environmental), 321 (Hydraulics) or 327 (Structures)

Electrical & computer: Engineering 325 (Digital) or 332 (Analog)

Mechanical: Engineering 333 (Thermal/Fluids) or 322 (Machines)

*Students pursuing the minor must obtain permission from the engineering department chair prior to taking 300-level engineering courses.*

**ARCHITECTURE MINOR**

See Art and Art History Department.

**COURSES (ENGR)**

**101 Introduction to Engineering Design** (2). F An introduction to the engineering design process and resource design tools by means of projects, lectures, homework, mentor visits, and team meetings. Team projects,

including service learning, require application of creativity, engineering analysis, and computational tools. Readings, lectures, and discussions also examine the areas of technology in society, engineering ethics, and library research methods. Various computer software tools are introduced and used. This course fulfills the foundations of information technology core category.

**103 Architectural Communication and Concept Design I** (3). F See Architecture 103.

**106 Engineering Chemistry and Materials Science** (4). S. An introduction to the science of engineering materials. Engineering properties of materials - mechanical, electrical, and chemical - are closely linked to the underlying solid state and molecular structure. Chemistry relating to various aspects of design including phase change, solution theory, acid-base solutions, and chemical equilibrium is presented. This course is team-taught by chemists and engineers to facilitate the integration of basic chemical principles and engineering design. Issues of stewardship of resources are addressed. Laboratory. Prerequisites: Chemistry 103, Engineering 101, and Mathematics 170 or 171.

**181 Engineering Graphical Communication Lab** (2). F This laboratory course focuses on techniques and computer software tools used for visualization and engineering communication. The course introduces graphical techniques for spatial analysis, including orthographic projection, free-hand sketching, pictorial representation, descriptive geometry, sections, basic dimensioning, and tolerancing.

**184 Sustainability Challenges** (1) F Sustainability involves meeting the needs of the present without compromising the ability of future generations to meet their own needs. This course examines the challenges to achieving sustainability in three arenas: economic, social, and environmental. Topics include global energy usage, personal carbon footprint, world population, and climate change. The trade-offs among biblical principles related to sustainability (stewardship, justice, and the cultural mandate) are examined.

**202 Statics and Dynamics** (4). F, S. A study of fundamental principles of mechanics and their application to the problems of engineering. Vector algebra, forces, moments,

couples, friction, virtual work, kinematics of a particle, kinematics of a rigid body, dynamics of particles and rigid bodies, impulse, momentum, work, and energy are presented in two and three dimensions. Prerequisites: Physics 133, Mathematics 172.

**204 Circuits Analysis and Electronics (4).** F, S. An introduction to the theory and application of electronic circuits and devices. The following topics are covered: basic linear circuits (including frequency and transient response), semiconductor devices (diodes, op-amps, comparators, etc.), electric power, electric safety, and DC machines. Laboratory exercises are used to illustrate the material covered in the lecture portion of the course. Students will measure voltage, current, resistance, power, transient response, resonant circuits, voltage regulators, operational amplifiers. Students will investigate digital logic circuits. Co-requisite: Physics 235.

**209 Introduction to Conservation Laws and Thermodynamics (4).** F, S. This course introduces several foundational engineering topics. Included are single and multi-component process material and energy balances (conservation laws), the first and second laws of thermodynamics and heat transfer. Study of chemical kinetics and equilibrium demonstrates the link between science and design begun in Engineering 106 and also broadens the student's knowledge of chemistry. Issues of stewardship of materials and resources are addressed. Laboratory. Prerequisites: Engineering 106 and Mathematics 172 or permission of the instructor.

**220 Introduction to Computer Architecture (4).** F. A study of computer organization (including memory hierarchy, I/O, bus-based systems, distributed systems, and parallel systems), and computer architecture (including CPU control, pipelining, and instruction set architecture). Laboratory exercises emphasize principles. Prerequisites: A programming language course, normally Computer Science 104 or 106 or 108 or permission of the instructor.

*Prerequisite to all courses numbered 300 or higher is formal admission to a BSE concentration.*

**302 Engineering Electromagnetics (4).** S. A study of the laws and engineering applications of electric and magnetic fields in

various conductive, dielectric, and magnetic materials and under various boundary conditions. Emphasis is on the analysis and design aspects of transmission line circuits. Prerequisites: Mathematics 231 and Physics 235.

**303 Chemical Engineering Principles and Thermodynamics (3).** F. This course continues the study of chemical engineering principles begun in Engineering 209. Included are material and energy balances with reaction and introduction to vapor-liquid and liquid-liquid equilibrium including the concepts of dew and bubble points and the flash process. Process simulators (UNISIM) are introduced. Principles are reinforced with an in-depth team design project of a commercial process. Basic concepts of thermodynamics, i.e., equilibrium, reversibility, system are presented. This material provides the foundation for the in-depth study of thermodynamics in Engineering 312. Prerequisites: Engineering 209 and concurrent registration in Chemistry 317.

**304 Fundamentals of Digital Systems (4).** S. An introduction to the fundamental principles of logic design in digital systems. Topics include: Boolean algebra, analysis and synthesis of combinational and sequential networks, register transfer language, micro-operational description and applications to computer design, computer organization and assembly language programming, and asynchronous logic. The student is introduced to digital logic families and programmable logic devices, digital logic CAD tools, logic synthesis and hardware description languages (VHDL). Laboratory work will include logic design and assembly language programming. Prerequisites: Engineering 204 and a programming language course (normally Computer Science 104 or 106 or 108).

**305 Mechanics of Materials (4).** F. Application of principles of mechanics to the solution of problems in stress and strain of engineering materials, including resistance to force, bending, torque, shear, eccentric load, deflection of beams, buckling of columns, compounding of simple stresses, introduction to theory of failure, and energy methods. Prerequisites: Engineering 106 and 202. Corequisite: Mathematics 231.

**306 Principles of Environmental Engineering (4).** F. A study of environmental engineering

and science principles relevant to engineered and natural systems. Topics considered in this course include an overview of the domains of environmental engineering, relevant units of measurement, population dynamics, contaminant types, sources and presence, chemical stoichiometry, equilibria, and kinetics, mass and energy balances, mass/particle transport processes, microbial ecosystem structure and function, biogeochemical cycling, and oxygen demand. Prerequisites: Engineering 209, or permission of the instructor.

**307 Electrical Signals and Systems (4).** F. Advanced techniques for the analysis of analog electrical systems. Topics include: frequency domain analysis, Laplace transforms, Fourier series, Fourier transforms, and continuous versus discrete signal analysis. Frequency response is analyzed using transfer functions, Bode plots, and spectral plots. Digital Signal Processing (DSP) is introduced. Prerequisites: Engineering 204, Mathematics 231.

**308 Environmental Engineering Design (4).** S. Application of environmental engineering and science principles to the design of environmental control measures and engineered systems. Problems considered in this course will include design of water supply and treatment processes, wastewater treatment processes, processes for air pollution control, groundwater remediation, and solid and hazardous waste management. Prerequisites: Engineering 306, or permission of the instructor.

**311 Electronic Devices and Circuits (4).** F. A study of the characteristics and qualitative internal action of commonly used micro-electronic devices for discrete and integrated circuits, such as diodes, metal-oxide semi-conductors FETs (MOSFETs), and bipolar junction transistors (BJTs). Application of these devices in basic amplifier circuits is explored. Laboratory exercises are used to illustrate concepts. Prerequisite: Engineering 204 and Mathematics 231.

**312 Chemical Engineering Thermodynamics (4).** S. Thermodynamic topics important in Chemical Engineering are addressed. The properties of real fluids and equations of state, properties of mixtures, phase equilibrium, and chemical equilibrium. Prerequisites: Engineering 303, and Chemistry 317.

**314 Vibration Analysis (4).** S. Analysis of me-

chanical vibration in both transient and steady state regimes, employing analytical and computer techniques for solution. Linear and nonlinear problems are investigated with original inquiry suggested and encouraged. Prerequisites: Engineering 202 and Mathematics 231.

**315 Control Systems (4).** F. An introduction to linear feedback control theory, including transient and frequency response, stability, systems performance, control modes, and compensation methods. Hydraulic, electrical, pneumatic, and inertial components and systems are investigated and employed. Prerequisites: Engineering 204 and Mathematics 231.

**318 Soil Mechanics and Foundation Design (4).** S, alternate years. Soils studied as engineering materials whose behavior is dependent upon soil types, index properties, and soil moisture conditions. The scope of the course includes soil structures, index properties, soil classification, permeability, compressibility and consolidation, soil testing, soil stresses, and foundation design. Laboratory experiments are used to emphasize principles. Prerequisite: Engineering 305.

**319 Introduction to the Thermal/Fluid Sciences (4).** F. An introduction to the engineering thermal and fluid sciences including elements of thermodynamics, fluid mechanics, and heat transfer. Concepts include the properties of fluids, first and second laws of thermodynamics, external and internal viscous and ideal flows, and conduction, convection, and radiation heat transfer. Laboratory and project exercises are used to illustrate concepts. Prerequisites: Engineering 202 and 209, Mathematics 231.

**320 Hydraulic Engineering (4).** S. Application of the basic principles of fluid mechanics to practical problems in hydraulic and hydrologic analysis. Topics include fluid statics, hydrology, open channel flow, closed conduit flow, and centrifugal pumps. Computer techniques and laboratory exercises are used to emphasize principles. Prerequisite: Engineering 319.

**321 Hydraulic Engineering Design (4).** F. Application of principles of hydraulics and hydrology to the design of hydraulic systems. Problems considered in this course will include design of pipe networks for water distribution, design of sewage collection systems, design of pumping facilities, design

of groundwater remediation systems, and design of flood control structures. Computer techniques will be frequently employed. Prerequisite: Engineering 320.

**322 Machine Design with Finite Element Analysis** (4). S. Application of engineering mechanics, materials, and failure theories to the analysis and design of mechanical elements and systems. Computer techniques are used as aids to analysis and design. Prerequisite: Engineering 305.

**324 Materials and Processes in Manufacturing** (4). S. This course introduces students to the various mechanical and management issues involved in the fabrication of manufactured goods. Scientific and engineering principles are applied to fabricating processes such as casting, forming, and machining so as to determine the relation of process to material properties, economics, dimensional accuracy, and energy requirements. Topics such as computer-aided manufacturing (CAM), numerical control (NC), statistical quality control (SQC), and quality management are also explored. Field trips and laboratories are used to support the lecture material. Prerequisites: Engineering 106 and 305.

**325 Computer Architecture and Digital Systems Design** (4). F. Design of advanced digital systems using programmable logic, Application-Specific Integrated Circuits (ASICs), and microprocessors. Microprocessor architecture including pipelining, memory hierarchy, cache, instruction set architecture, CPU control, bus standards, I/O, superscalar, and Very Long Instruction Word (VLIW) approaches. Interfacing and communication techniques, including data error detection and correction codes. Introduction to parallel processing. Laboratory exercises emphasize the design of microprocessor-based digital systems. Prerequisite: Engineering 304.

**326 Structural Analysis** (4). S. A study of beams, two-dimensional trusses, and rigid frames. Course work includes calculation of shear forces and bending moments due to fixed and moving loads, calculation of deflection, analysis of moving loads using influence lines, and the analysis of statically indeterminate structures. The course also includes an introduction to matrix methods in structural analysis. Prerequisite: Engineering 305.

**327 Structural Design** (4). F. Application of principles of mechanics of solids and structural analysis to the design of structural members made of steel or reinforced concrete. Load and factored resistance design procedures are studied along with the current steel specification for the design, fabrication, and erection of structural steel for buildings and the building code requirements for reinforced concrete. Computer techniques are used as aids to analysis and design. Prerequisite: Engineering 181, Engineering 326.

**328 Intermediate Thermal/Fluid Sciences and Design** (4). S. An intermediate treatment of heat transfer and thermodynamics including analysis and design related to steady and unsteady conduction with an emphasis on two and three dimensions, free and forced convection, radiation modes of heat transfer, power and refrigeration cycles, air conditioning processes, chemical equilibrium, and combustion. Laboratory, design, and computer exercises are utilized to emphasize principles. Prerequisite: Engineering 319.

**330 Fluid Flow and Heat Transfer** (4). S. Applications of fluid flow and heat transfer fundamentals to Chemical Engineering problems including heat exchanger design and designs for the transportation and metering of fluids. Unit operations of filtration and evaporation are covered. Prerequisites: Engineering 209 and 303.

**331 Kinetics/Reactor Design** (4). F. An introduction to chemical kinetics and reactor design. Principles of kinetics of homogeneous and heterogeneous reactions with differential and integral analysis of kinetic data are included. Ideal reactor design concepts, non-isothermal reactor design, and design of catalyzed fluid-solid reactors are presented. Mass transfer, as it impacts multiphase reactor design, is introduced. One open-ended team design project and one kinetics lab project will be done to reinforce concepts presented in class. Prerequisites: Engineering 312, 330, and Chemistry 317.

**332 Analog Circuits and Systems Design** (4). S. Feedback principles and electronic circuit theory and device theory applied to multistage transistor amplifiers. Detailed study of operational amplifier specs, non-idealities, and compensation. Introduction to filter the-

ory and practical realizations. Power supply design: Rectifier circuits, linear, and switching regulators. Nonlinear circuits: Comparators, multipliers, Schmitt trigger, S/H circuits, multi-vibrators, and oscillators. Introduction to noise analysis and low noise design. Emphasis on realization of designs using commercially available IC's. Design experience emphasized in projects and the laboratory. Prerequisites: Engineering 307 and 311.

**333 Thermal Systems Design (4).** F. Advanced heat transfer, thermodynamic, and fluid flow topics important for the design of thermal systems are presented. Sustainability and creation care topics are covered as they pertain to energy generation and fossil fuel resource depletion. Availability (energy) analysis and methods for the optimization of system components are discussed. Selection and design of fluid flow and heat transfer equipment used in energy conversion systems are emphasized. Economic evaluation is studied. A co-generation system is studied throughout the semester to emphasize basic principles of analysis and design. A design project focused on sustainable energy generation or energy conservation is required. Prerequisite: Engineering 328.

**334 Dynamics of Machinery (3).** S. This course investigates various dynamic aspects of machinery. An in-depth study is made of mechanisms such as the four-bar linkage. Cams and gears are studied in the context of their use in machines. Vibration concerns are addressed including methods of balancing rotating machinery. Kinematics and kinetics are studied in a three-dimensional space with an emphasis on application in the area of robotics. Computer simulation of mechanisms is used to reinforce basic concepts. Prerequisite: Engineering 202.

**335 Mass Transfer and Staging Operations (4).** F. Mass transport fundamentals are applied to Chemical Engineering design problems. Principles of equilibrium mass transport operations are applied to distillation, gas absorption, extraction, and humidification design. Prerequisite: Engineering 312 and 330.

**337 Chemical Engineering Laboratory (2).** S. Principles of fluid flow, heat transfer, mass transfer, stage-operations, and chemical kinetics are studied using small-scale equipment. Evaluation and analysis of experimental observations, project proposals, and

report writing is emphasized. Prerequisites: Engineering 331, 335, and Chemistry 317.

**338 Introduction to Traffic Engineering and Highway Design (4).** S, alternate years.

Introduction to the basic concepts of traffic engineering and highway design. The traffic-engineering portion introduces basic concepts including how the motorist, vehicle, road, and pedestrian interact, roadway capacity and Level-of-Service, traffic flow and queue theory, and traffic signal timing. Software applications are introduced regarding traffic simulation and capacity analysis. The highway design portion of the course focuses on the basics of horizontal and vertical alignment of roadways, design vehicle, design speed, superelevation, sight distance, and other design considerations. Prerequisite: admission to the civil & environmental engineering concentration or permission of the Instructor.

**339 Senior Design Project (2).** F. This is the first course in the senior design project sequence. Emphasis is placed on design team formation, project identification, and production of a feasibility study. Students focus on the development of task specifications in light of the norms for design and preliminary validation of the design by means of basic analysis and appropriate prototyping. Lectures focus on integration of the design process with a reformed Christian worldview, team building, and state-of-the-art technical aspects of design. Interdisciplinary projects are encouraged. Prerequisites: Admission to an engineering concentration, concurrent registration in the seventh semester of the model program for a particular concentration or permission of the instructors.

**340 Senior Design Project (4).** S. This is the second course in the senior design project sequence. Emphasis is placed on the completion of a major design project initiated in Engineering 339. This project should entail task specifications in light of the norms for design by means of engineering analysis and an appropriate prototype focused on primary functionality. A final presentation is given at the May senior design project program. Lectures continue to focus on integration of the design process with a reformed Christian worldview, team activity, and state-of-the-art technical aspects of design. Prerequisites: Admission to an engineering concentration,

Engineering 339 (taken the semester immediately prior), Developing a Christian Mind. At least concurrent registration in Philosophy 153 and Religion 121/131. This course fulfills the integrative studies core category.

**342 Process Dynamics, Modeling, and Control** (4). S. Introduction to the analysis of process dynamics, and to the design and analysis of process control systems. Covers transient and frequency response, transfer functions, stability, performance, linearization, decoupling, and multivariable control. Prerequisites: Engineering 209 and Mathematics 231.

**382 Engineering Instrumentation Laboratory** (1). S. Laboratory course, which serves as an introduction to the characteristics and uses of transducers to measure displacement, strain, pressure, temperature, velocity, acceleration, and other physical quantities. Emphasis is on the usefulness, accuracy, and reliability of measurement systems in actual applications. Electronic signal conditioning techniques are covered. A design project using LabVIEW software and FilePoint data acquisition hardware is required. Written reports required. Prerequisites: Engineering 204.

**384 Analysis of Sustainability Engineering Systems** (1) F and S. Sustainability engineering seeks to serve the needs of the present without compromising the ability of future generations to meet their own needs. This course analyzes the effectiveness of proposed sustainability engineering systems and methods to obtaining that goal in three arenas: economic, social, and environmental. It also discusses analysis approaches for sustainability. Topics include global energy usage, personal carbon footprint, world population, and climate change. The trade-offs among biblical principles related to sustainability (stewardship, justice, and the cultural mandate) are examined.

**390 Independent Study.** F, I, and S. Independent readings and research. Prerequisite: permission of the chair.

### On Campus Interims

**Mobile Robotic Systems.** Mobile robotic systems are becoming more commonplace and are now handling some of the most dangerous tasks, allowing humans to stay at a safe distance. In this course, students will learn

about the historical development of mobile robotic systems, including some ethical issues surrounding such systems. Students will also analyze and design the electrical, mechanical, and control aspects of robotic systems. The final project will involve the construction and implementation of a mobile robotic system. Through this hands-on experience, students will learn about the mechanical structures needed to build the system, the motors and gears to drive the system, the sensors to guide the system, the wireless modules to communicate with the system, and the control algorithms and hardware to manage the system. Students will be evaluated on in-class discussions, lab write-ups, design project presentations, design project reports, demonstration, and their participation in the team design projects. Prerequisites: C Language Programming or equivalent, Engineering 307 & 311, and Metal Shop Training. Preference given to senior-standing ECE engineering students.

**Sustainable Energy Systems.** Renewable and sustainable energy systems are providing increasingly large fractions of the energy mix worldwide. In this course, students consider historical development, fundamental engineering principles, economic factors, and energy return on investment for a wide variety of renewable and sustainable energy technologies. An understanding of system design software is obtained through in-depth focus on one renewable energy technology. Several design projects are required. Prerequisite: Engineering 333 or permission of the instructor.

**Water and Wastewater Treatment Design.** This course addresses the application and theory of chemical, physical, and biological processes related to potable water treatment and wastewater treatment systems. Problems considered include unit process design for the following potable water treatment plant components: screening, coagulation, mixing, flocculation, chemical softening, filtration, disinfection, ion exchange, adsorption, membrane filtration, and residuals handling. Additional coverage includes unit process design for wastewater treatment components including: activated sludge, trickling filters, membrane bioreactors, aeration, clarification, and solids handling and stabilization. Prerequisites: Engineering 306 and senior standing or permission of the instructor.

**Advanced Chemical Engineering.** This course addresses essential advanced topics for design. Topics build on the foundational concepts from several earlier engineering courses. The course includes advanced topics from separations, heat transfer, and non-elementary kinetics. An introduction to mathematical modeling for advanced transport is considered. In addition, fundamental concepts of environmental, health, and safety issues, as well as corrosion and materials of construction for design are presented. Prerequisites: Engineering 330, 331, 335, and senior standing. Students evaluated by written lab reports, homework, oral presentations, and final exam.

**Site Development and Design.** This course focuses on civil engineering site development and design (SDD). The objectives of this course are for students to:

- Know the key elements used in the design of a civil engineering projects (e.g., topographical analysis and earth balances, infrastructure documentation and linkage, regulations and permitting, and integration of built and natural systems;
  - Understand and apply various land measurement applications (e.g., surveying, global positioning systems, and geographic information systems) that are typically used for SDD; and
  - Learn sustainable SDD practices (e.g., LID and LEED) by integrating these into course design projects.
- Student performance will be evaluated with their work on course design tasks, projects, and lecture quizzes. Prerequisites for this course include Engr 306, Engr 320, and Engr 326, or permission of the instructor.

#### Off Campus Interims

**Business, Engineering, and Religion in the Context of European Culture.** This course introduces the student to the nuances of business practices and product development in the international market, focusing on business, research, and development in Europe. Students learn how the languages, history, culture, economics, regulations, and politics of Europe shape the business and design process through tours of businesses, engineering-research facilities (industrial and academic), and manufacturing facilities as well as discussion sessions

with leading business executives and research engineers in Europe. Locales include Amsterdam, Rotterdam, Delft, Brugge, Brussels, Paris, Koblenz, Offenbach, Zurich, Munich, Nürnberg, Leipzig, Berlin, Bremen, and Koln. Additional religious and cultural locales include The Begijnhof, The Hague, Louvain, Versailles, Notre Dame Cathedral, Reims, Heidelberg, Dachau, Neuschwanstein, Prague, St. Vitus Cathedral, Wittenberg, Magdeberg, and Koln Cathedral. Students keep a daily journal and complete study assignments that focus attention on key issues related to the day's tour. Prerequisite: Business 160 or Engineering 101 or permission of the instructor.

**Dutch Landscapes: Society, Technology, and Environment.** Few countries exist where human activities have exerted a greater influence in the shaping of the land than the Netherlands. With daily field excursions and detailed topographic maps, students study this country's richly varied and historically layered cultural landscapes. Land reclamation, water management, and environmental preservation technologies used over many centuries are an important part of understanding the complex interrelationships between society, technology, and land. Additionally, students have opportunities for direct engagement with people from this country. Briefings, interpretation en route, topographic maps, and study-sheet assignments guide each field trip. Students spend one Sunday with a Dutch family. Open days are integrated to provide opportunities for personal travel. Not offered in 2015–2016

**In Search of Clean Water in Ethiopia:** This course travels to Ethiopia. Water is our primary focus. We explore its complexities in the context of an increased population, climate change, land degradation, economic development, cultural change (including that by the Christian church) and the efforts of non-governmental agencies. The main portion of the course occurs in South Gondar. The overland trip crosses a variety of geographical and cultural terrains. Students make an assessment of technical efforts to secure water – boreholes, traditional wells, pan dams, rehabilitated dams, and capped springs – as well as consider future alternatives. Students conduct a social survey so as to understand the cultural, economic, health and spiritual issues associated with water and land use as well as the perception and reception



to water projects. In the capital city of Addis Ababa, students celebrate Ethiopian Christmas with host families. Students have first-hand exposure to Ethiopian culture, including a home stay in a rural community. The trip includes the 2nd largest waterfall in Africa, the historical attraction of Lalibella to witness the celebration of Timket (the 2nd most important celebration of the year in Ethiopia) and climbs to cave churches in Gerhalta. Students are personally challenged as the complex realities of Ethiopia are explored. Briefings occur at the US Embassy and a variety of water projects. This course may fulfill an elective in the Engineering and Geography majors as well as for majors and minors in International Development Studies.

**Engaging Development in Cambodia.** The goal of this class is to identify and better understand the root causes of abject poverty in Cambodia. Issues to be engaged include food production capacity, land use trends, availability or reasonable quality of adequate water, and availability of education and human health care. We plan to engage a variety of non-governmental organizations involved in supporting the holistic transformation of communities: CRWRC village projects enabling people to produce greater quantities of healthful food, water filtration and pumping methods, orphanages, Kindergarten classes, hospitals, and several Christian churches. Students will have opportunity to contribute service-learning hours by working with several of these organizations. The class will start by engaging the historic and cultural underpinnings that created the current situation in Cambodia. A visit of the Angkor Wat temples will introduce the ancient historical foundation of Cambodian culture, and be followed by visits to the Killing Fields and Tuol Sleng prison to underscore the recent impact of the Khmer Rouge. Students will gain a clear understanding of what current living conditions are in Cambodia for an average Cambodian citizen, how they have come to be as they are, what the impediments to change are, what can and is being done to make a positive and sustainable change, and how to be agents of redemption in a deeply troubled society. This class is a cooperative learning adventure with Calvin College and Handong Global University (South Korea). Student assessment will be based on participation with local cultures, individual journaling, group discussions, and a final report describing key features of their

learning experience. This course may fulfill an elective in the International Development Studies major and minor. It also qualifies toward the requirements of the Engineering Department's International Designation program. This course will fulfill the CCE requirement.

**Business and Engineering in China.** China's emerging economy has a large impact on today's world, especially in business and engineering. During this interim students will spend three weeks in China meeting with business and engineering professionals who are part of this reshaping of the global economy. The course will include the major cultural and economic centers of China, starting in Beijing, continuing in Shanghai and surrounding areas, then Xiamen, and finally Guangzhou and Hong Kong. Approximately ten meetings will be arranged with business and engineering professionals. In addition many important historic and cultural sites will be explored, including the Chinese New Year celebration. Evaluation is based on a journal and a reflective essay. Preference will be given to students majoring in the Business Department or Engineering Department. Not offered 2015–2016

### Seminars/Internships

185/285/385 **Engineering Internship** (0). Students who complete an Engineering Internship during the summer as part of the department's internship program, may receive transcript recognition for their effort. Freshmen, sophomores, and juniors will receive credit for Engineering 185, 285, and 385 respectively. These internships, consisting of engineering work at an appropriate level, should be for a minimum of nine (9), full-time, consecutive weeks. Students must provide a brief written report of their activities under the signature of their supervisor. The students must also make a presentation of their internship work during the following semester. The report and copies of the presentation material should be submitted to the department's internship coordinator for approval. Other procedures and activities may be given internship credit. Application for exceptional cases must be made to the internship coordinator.

294/394 **Engineering Seminar** (0). F, S. A seminar devoted to an exploration of topics in engineering. Seminars will cover areas

such as the practice of engineering design, non-technical issues in engineering practice, engineering graduate studies, and aspects of engineering analysis. Students will receive transcript recognition for Engineering 294 if they attend eight (8) seminars before being admitted to a BSE concentration and will receive transcript recognition for Engineering 394 if they attend eight (8) seminars after being admitted to a BSE concentration. Plant tours and technical society meetings may be substituted for seminars upon approval.

**295 Internship Workshop (0).** F A four session workshop intended to prepare freshman/sophomore level engineering students to successfully obtain a summer internship and to be a responsible employee. The workshop topics include: Calvin's engineering internship program, finding an internship, writing a resume, interviewing, and on-the-job behavior. Completion of the workshop is a requirement for admission to a concentration in the engineering program.

**387 International Engineering Internship (0).** Students, who complete an International Engineering Internship during the summer as part of the department's internship program, may receive transcript recognition for their effort. These internships, consisting of engineering work at an appropriate level, should be for a minimum of nine (9), full-time, consecutive weeks and shall take place in a country other than the United States and Canada. This internship must be in a country other than the home country of an international student. Students must provide a brief written

report of their activities under the signature of their supervisor. The students must also make a presentation of their internship work during the following semester. The report and copies of the presentation material should be submitted to the internship coordinator for approval. Other procedures and activities may be given international internship credit. Application for exceptional cases must be made to the internship coordinator.

### Summer Program in Germany

The Summer Program in Germany, gives engineering students the opportunity to take Engineering 202: Statics and Dynamics. This program is designed to fit a student's program during the summer following either their first or second year at Calvin. A Calvin engineering professor accompanies the students to Germany and teaches Engineering 202. The students also take a course entitled German Language and Culture from a German professor. This summer program satisfies the Cross Cultural Engagement requirement. Prerequisites: German 101, Physics 133, Mathematics 172.

Classes are taught four days a week, providing opportunities for three-day weekends to do on-sight visits of engineering companies and travel in Europe. Typical departure is in early July and returning to Calvin in late August. Application process for this program begins in the fall semester of every school year. Interested students should inquire with their advisor or Prof. N. Nielsen.

# English

Professors S. Felch, D. Hettinga, J. Holberg, D. Rienstra (co-chair), K. Saupe, G. Schmidt, D. Urban, \*J. Vanden Bosch, E. Vander Lei, D. Ward  
Associate Professors C. Engbers (co-chair), B. Ingraffia, L. Klatt, L. Naranjo-Huebl, J. Williams, \*\*J. Zwart  
Assistant Professor K. Johnson

The department offers both majors and minors in all of the following: literature, writing, linguistics, and secondary and elementary English education. It also offers interdisciplinary minors in ESL and journalism. A student may alter any of the recommended programs with the permission of an academic advisor. Normally, all faculty will advise for the literature and writing majors and minors. The advisor for the linguistics major are Kristine Johnson. The advisors for the secondary-education programs are K. Saupe and J. Vanden Bosch. The advisors for the elementary-education programs are D. Hettinga. The advisor for the journalism minor is D. Hettinga.

Students who plan to graduate with honors in English must complete a minimum of six honors courses (or 18 hours of honors work): at least three in the English Department (not including English 101) and at least two from the general curriculum. Honors English 101 may count as the sixth honors course required for graduation. Honors students must also complete English 399: "Honors Thesis" as one of their three honors courses in English. In addition to maintaining a cumulative GPA of 3.5 or higher, both within the major and overall, a student must also earn at least a B+ on the Honors Thesis in order to graduate with honors. For specific questions about honors requirements in the English Department, contact the chair of the English Department's Curriculum Committee.

A minimum grade of C (2.0) in English 101 or 102 is required both for graduation and as a prerequisite to any concentration in the English Department. Typically, English 101 is the first course taken in the department. The core requirement in written rhetoric is met by English 101, 100/102, or by examination. The literature core requirement is met by English 200, 202, 212, 213, 214, 220, 221, 225, 226, 230, or 234, and in some cases 299.

A prerequisite for all 300-level English literature courses (300-338) is English 295 or the permission of the instructor.

## LITERATURE MAJOR

(36 semester hours)

English 295

English 330

One from English 200, 202, or 300

Two from English 212-214, 310-317, 337, or 338 (one 300-level required, two recommended)

Two from English 220-226, or 320-322 (one 300-level required, two recommended)

One from English 260-266, or 360-375

One from English 238, or 332-335

One from English 380, 390, or 399

English 395

One from English 200-238, 299-322, 332-341, or an approved English interim

*Only one interim may count toward the major.*

At least two courses (taken to fulfill a specific requirement or as an elective) must primarily

cover American or British literature written before 1800.

## LITERATURE MINOR

(21 semester hours)

English 295

One from English 200, 202, or 300

One from English 212-214, 310-317

One from English 220-226, or 320-322

One from English 330, 337, 338, 370-375

Two from English 200-238, 300-341, or

an approved English interim (one 300-level required, two recommended)

*Only one interim may count toward the minor*

## WRITING MAJOR

(36 semester hours)

English 295

English 260

One from English 262, or 264-266

Two from English 360, 362-poetry, or 362-fiction (may take both fiction and poetry), or 365

One from English 261, 373, or the editing interim

One from English 200-238, 300-322, or 332-341

One from English 310-322, 337, or 338

One from English 300-322, 332-341, or 370-375

One from English 300-322, 332-341, Communications Arts and Sciences 200, 211, 305, 318, or 327

One from English 380, 390, or 399 English 395

*Only one interim may count toward the major*

### **WRITING MINOR**

(21 semester hours)

English 260

One from English 360, 362-poetry, or 362-fiction (may take both fiction and poetry), or 365

One from English 262-266

One from English 200-238

Two from English 261-266, 360, 362, 380 or an approved English interim

One course chosen in consultation with advisor

*Only one interim may count toward the minor*

### **LINGUISTICS MAJOR**

(37-38 semester hours)

English 295 English 370

English 371

English 372

English 373

English 374 or 375

Two from English 200-266, 299-322, 332-341, 360, 362, 365, 390, or an approved English interim (at least one literature course)

Speech Pathology and Audiology 216

One from Classics 242, Communications Arts and Sciences 231, 238, 240, 253, 260, 305, 311, 327, 352, 384, Chinese 302, Dutch 309, French 302, 372, German 302, Geography 320, IDIS 301, 302, 356, 357, Japanese 302, Philosophy 173, 375, 378, 381, Psychology 201, 208, 333, 334, Religion 307, Sociology 153, 253, Spanish 301, 302, 310, 340, 341, 370, Speech Pathology and Audiology 210, 212, 215, 311, 361, 384, 387, or another cognate or Eng-

lish elective approved by advisor  
One from English 380, 390, or 399  
English 395

*Only one interim may count toward the major*

### **LINGUISTICS MINOR**

(21 semester hours)

English 370

English 371

Communication Arts and Sciences 140

Speech Pathology and Audiology 216

Three electives chosen in consultation with advisor

*Only one interim may count toward the minor*

### **SECONDARY EDUCATION**

#### **MAJOR IN ENGLISH**

(39 semester hours)

English 295 One from English 200, 225, 226, or 300

Two from English 212-214, 310-317, or 337 (one 300-level required, two recommended)

Two from English 220, 221, or 320-322 (one 300-level required, two recommended)

English 338

English 341

English 350

English 352

English 359

English 374 or 375

One from English 370-372

Students must complete English 350 and 352 before they may student teach.

For their student-teaching semester, students must register for both Education 346 and English 359.

Before being considered for a student-teaching placement, students must pass (80% or better on each section) all sections of the English Department Screening Exam. They must pass all five sections of the exam by October 1 of the calendar year immediately prior to their student-teaching semester. To take this exam, students must make an appointment with the English Department administrative assistant. Students have four chances to take the exam per calendar year, and they must allow at least two weeks to elapse between the time they try the exam once and the time they try it again.

Additional criteria for approval for student teaching are found in the *Teacher Education Program Guidebook*, available in the Education Department.

## **SECONDARY ENGLISH EDUCATION MINOR IN ENGLISH**

(21 semester hours)

English 295 One from English 200, 225,  
226, or 300

One from English 212-214, 310-317, 337,  
or 338

One from English 220, 221, 320-322, or 335

One from English 370, 371, or 372

English 350

English 352

All those who elect the secondary education minor in English must pass (80% or better on each section) all five sections of the English Department Screening Exam. They must pass this exam before they apply to be certified in the minor. To take the exam, students must make an appointment with the English Department administrative assistant. Students have four chances to take the exam per calendar year, and they must allow at least two weeks to elapse between the time they try the exam once and the time they try it again.

## **ELEMENTARY EDUCATION LANGUAGE ARTS GROUP MAJOR**

(36 semester hours)

Education 322

Education 326

English 230

English 261

One from English 200, 225, or 226

English 340 or 341

English 351

English 352

English 374 or 375

One from English 370, 372, Speech

Pathology and Audiology 215, or 311

Communication Arts and Sciences 214

One from Communication Arts and  
Sciences 203 or a Communications  
Arts and Sciences or English  
performance-based interim

Language arts elementary group majors will be allowed ONE exemption from the prerequisite of English 295 in order for them to take either English 340 or 341. If they wish to take both of these courses or any other 300-level literature course, they will be required also to take English 295. Elementary Education students generally will also be allowed this one exemption, but

they too must take English 295 if they wish to take a second 300-level literature course.

## **ELEMENTARY EDUCATION LANGUAGE ARTS GROUP MINOR**

(24 semester hours)

Education 326

One from English 200, 225, 226, or 230

One from English 261, 374, or 375

English 340 or 341

English 351 or 352

One from English 370, 372, Speech

Pathology and Audiology 215, or 311

Communications Arts and Sciences 214

Communications Arts and Sciences 203 or

a Communications Arts and Sciences

or English performance-based interim

Language arts elementary group minors

will be allowed ONE exemption from

the prerequisite of English 295 in order

for them to take either English 340 or

341. If they wish to take both of these

courses or any other 300-level literature

course, they will be required also to

take English 295. Elementary education

students generally will also be allowed

this one exemption, but they too must

take English 295 if they wish to take a

second 300-level literature course.

## **ENGLISH AS A SECOND LANGUAGE: ENDORSEMENT FOR ELEMENTARY OR SECONDARY EDUCATION**

(21 semester hours)

Speech Pathology and Audiology 216

English 370 or Spanish 340

English 372

English 375

Interdisciplinary 356 or 357

Interdisciplinary 301 (concurrent with

Education 302-303)

Education 303 (concurrent with Education

302 and Interdisciplinary 301)

## **ENGLISH AS A SECOND LANGUAGE: NON-EDUCATION MINOR**

(22 semester hours)

Speech Pathology and Audiology 216

English 370 or Spanish 340

English 372

English 375

Interdisciplinary 301

Sociology 253

An approved elective

Advisor: M. Pyper (Spanish)

## INTERDISCIPLINARY MINOR IN JOURNALISM

(21 semester hours)

Communication Arts and Sciences 230

English 264

English 266

Three electives chosen in consultation  
with the program advisor

English 380 or Communications Arts and  
Sciences 346

## COURSES (ENGL)

For more detailed descriptions of the courses offered for any given semester, see the English Department website.

100 **Enhanced Written Rhetoric I** (3). F. The first part of a year-long enhanced course sequence in written rhetoric. See the complete sequence description under English 102. Enrollment in English 100/102 is by special arrangement with Student Academic Services and the English Department.

101 **Written Rhetoric** (3). F, S. A course in which students write several academic essays in which they practice rhetorical strategies, research-based argumentation, and methods of composing effective prose. In the process of writing these essays, students consider language as a means of discovering truth about God, the world, and themselves, and they explore its potential to communicate truth and, thereby, to transform culture.

102 **Enhanced Written Rhetoric II** (3). S. The second part of a year-long, enhanced course sequence in Written Rhetoric. Students enrolled in English 100/102 write expository essays, focusing particularly on how to conduct academic research, producing research-based argumentation. In the process of writing these essays and mastering conventions of language, students consider language as a means of discovering truth about God, the world, and themselves; and they explore its potential to communicate truth and, thereby, to transform culture. Prerequisite: English 100.

200 **Literature in a Global Context** (3). F, S. A survey of literature that crosses borders, accumulating meaning as it travels beyond its nation or culture of origin. Texts will include both Western and non-Western works and will cluster around a defined focus such

as a specific genre, theme, or period of time.

202 **Russian Literature** (3). S. A survey of the Russian literary tradition in English translation, including writers such as Pushkin, Tolstoy, and Dostoevsky.

212 **Survey of British Literature I** (3). F, S. A survey of British literature from its origins through the English Civil War in the seventeenth century.

213 **Survey of British Literature II** (3). F, S. A survey of British literature from the Restoration of the monarchy in the seventeenth century through Romanticism in the nineteenth century.

214 **Survey of British Literature III** (3). F, S. A survey of British literature from the rise of Victorianism in the nineteenth century through contemporary literature in the twenty-first century.

220 **Survey of American Literature I** (3). F, S. A survey of American literature from the colonial period through the Civil War, with attention to representative cultural perspectives and intellectual movements.

221 **Survey of American Literature II** (3). F, S. A survey of American literature from the end of the Civil War to the present, with attention to representative cultural perspectives and intellectual movements.

225 **African American Literature** (3). F, S. A survey of major writers and works of African American literature. Readings will include fiction, poetry, and drama, with special attention paid to historical and cultural contexts.

226 **Ethnicity in American Literature** (3). F. A survey that addresses ethnic perspectives in the literatures of the United States, as well as the contributions of such literatures to an American identity, history, and literary tradition. The course may focus on any or all of the major American ethnic perspectives in literature, such as Native American, Latino American, Asian American, Jewish American, and African American.

230 **Understanding Literature** (3). F, S. A survey of selected literary works with an emphasis on the fundamental elements of literature and methods of reading. Discussion topics may include the genres of literature and

their conventions, the means by which texts create meaning and wield influence, the ways readers can interpret and respond to texts, and the roles of imaginative literature in shaping and reflecting culture. An abiding concern will be how Christians might take a distinctive approach to this area of human culture.

**234 Gender and Literature** (3). F A survey that examines literature through the lens of gender, with particular emphasis on writing by women. Normally, the course will also have a national focus (British or American literature).

**238 Film as a Narrative Art** (3). F, alternate years. An survey of the art of film, focusing on narration and narrative structure, characterization, conflict, setting, and point of view, while also acquainting students with literary adaptation and with the contribution of film image and sound to narrative development. Also listed as Communication Arts and Sciences 296.

**260 The Craft of Writing** (3). F A course that invites students to write in a variety of genres, exploring composition from two perspectives—how texts are constructed and what they accomplish. From these two perspectives, students will consider the two classical categories of written genres: poetics (the study of belletristic writing) and rhetoric (the study of persuasive writing). This is a foundational course for students who are interested in advanced study of writing. Prerequisite: English 101 or 102 or approval of the instructor.

**261 Academic & Professional Writing** (3). S, alternate years. A course in rhetoric and composition designed for students who wish to prepare for writing in their professions or in graduate school. Students enhance their abilities to create and edit effective writing in the genres that they will encounter as professionals.

**262 Business Writing** (3). A course introducing students to the kinds of writing, computer presentations, and electronic media options used in business-related fields. Students collect examples of and practice composing the types of professional communication that they are likely to craft on the job. The class is conducted as a workshop; students consult with each other and with the instructor. Each student submits several projects. The class also includes a group report (with written, multi-media, and oral portions), in-class writing and computer exercises, and the use of word-processing and

presentation software. Prerequisite: completion of English 101 with a grade of C+ or above.

**264 Basic Journalism** (3). F An introduction to reporting for news media, using Associated Press guidelines to write for newspapers and online publications. This course focuses on methods of news gathering, interviewing, and research with particular emphasis on reporting about current affairs. Students analyze trends and discuss ethical issues in contemporary journalism, but their primary focus is on the writing and editing of news.

**266 Feature Journalism** (3). S, alternate years. A course in the art of writing feature stories for magazine and online publications. Students research, write, and edit several substantial articles for different audiences, paying particular attention to matters of strategy and style as called for by those audiences. Topics range from profiles of people to articles about science, history, religion, art, or contemporary events. Although the primary focus of the course is writing, students do explore the possibilities of multimedia journalism.

**295 Introduction to Studies in English** (3). F, S. An introduction for all English majors in the fundamental questions of the discipline as well as the tools necessary for students to succeed in advanced work in the major. This course serves as an overview of English's history, methodologies, and hermeneutical traditions. It also focuses on vocation in both theoretical and practical ways. This course will function as the bridge between introductory courses and advanced ones. Although this class will serve as a prerequisite to all 300-level literature courses, students may take 300-level courses, including literature courses, concurrently with English 295.

**299 Special Topics in Literature** (3). F, J.R.R. Tolkien. This course studies the major fiction of J.R.R. Tolkien in multiple historical contexts, including the northern European medieval heroic tradition from which Tolkien drew and the twentieth century war poets who were his contemporaries. The course also includes attention to Tolkien's own work as a translator, critic, and theorist, and to recent criticism of Tolkien's own writing, with particular attention to explicitly Christian criticism. The course satisfies an elective for the literature major and the core requirement in literature.

300 **Advanced World Literature** (3). S. A focused study of recent world literature that crosses borders. This course may forefront writing from a discrete nation, such as Chinese literatures, or examine texts belonging to a global, cosmopolitan movement, such as postcolonialism.

310 **British Literature of the Middle Ages** (3). F alternate years. A focused study of the literatures of the Anglo-Saxon and Middle English periods.

312 **British Literature of the Renaissance and Reformation** (3). F alternate years. A focused study of the writing and cultural contexts of Great Britain from the time of the English Reformation through the English Civil War.

313 **British Literature of the Eighteenth Century** (3). S alternate years. A focused study of the writing and cultural contexts in Great Britain from the Restoration of Charles II in 1660 to the emergence of Romanticism.

314 **British Literature of the Early Nineteenth Century** (3). F alternate years. A focused study of the Romantic literature and cultural contexts of Great Britain, especially as it appeared in poetry and prose during the first four decades of the nineteenth century.

315 **British Literature of the Middle and Later Nineteenth Century** (3). S alternate years. A focused study of the Victorian authors of Great Britain and the cultural contexts in which they wrote.

316 **British Modernism** (3). F alternate years. A focused study of the writing and cultural context of Great Britain during the Modernist period, 1901-1939.

317 **Contemporary British and Commonwealth Literature** (3). S alternate years. A focused study of the writing and cultural contexts of Great Britain and its commonwealth from World War II to the present.

320 **Literature of the United States I: Settlement to Civil War** (3). F. A focused study of the fiction, poetry, drama, and/or non-fiction prose produced in the United States prior to the Civil War, with a focus on those writers and texts most emblematic of—or influential in—shaping America's diverse literatures.

321 **Literature of the United States II: Civil War to Great Depression** (3). S. A focused

study of the fiction, poetry, drama, and/or non-fiction prose produced in the United States between the Civil War and Great Depression, with a focus on those writers and texts most emblematic of—or influential in—shaping America's diverse literatures.

322 **Literature of the United States III: World War II to the Present** (3). S. A focused study of the fiction, poetry, drama, and/or non-fiction prose produced in the United States from World War II to the present, with a focus on those writers and texts most emblematic of—or influential in—shaping America's diverse literatures.

330 **Hermeneutics and the Study of Literature** (3). S. An exploration of literary interpretation that considers various critical theories, both traditional and contemporary, through which texts can be read and understood, with illustrations of various hermeneutic approaches as well as practical criticism.

332 **The Novel** (3). F. An intensive study of the novel from its origins through its contemporary manifestations, including the work of major novelists, the development of important sub-genres, and the history of ideas and culture that have influenced the novel. Normally, the course alternates yearly between British and American novels.

333 **Poetry** (3). F alternate years. An intensive study of selected poets in English. Readings involve focused attention on individual poems, the history and formal concerns of the genre, and essays on poetics. The emphasis of the course varies according to individual instructor and may include such offerings as the Sonnet, L=A=N=G=U=A=G=E Poetry, the Metaphysical Tradition, Lyric Poetry, Georgics, American Surrealism, the New Formalists, the Elegy, Open Form, or Imagism.

334 **Drama** (3). F alternate years. An intensive study of dramatic literature. The emphasis of the course varies according to individual instructor.

335 **Genre Study** (3). S alternate years. An intensive study of a particular medium or genre, such as the graphic novel or the short story, chosen by the instructor.

337 **Major Authors** (3). S. An in-depth exploration of the works of a major literary figure. Normally, this course will alternate between a



study of Chaucer and a study of Milton.

338 **Shakespeare** (3). F, S. An in-depth exploration of the major works of William Shakespeare.

340 **Children's Literature** (3). F, S. A focused study of children's literature, including intensive reading of the best of this literature and the application of literary standards to what is read. The ENGL 295 prerequisite is waived for students in the Elementary Education Program unless the plan to enroll in additional 300-level literature courses.

341 **Adolescent Literature** (3). F, A focused study and critical evaluation of the nature and content of adolescent literature, including intensive reading, application of literary standards, and discussion of issues in the field of young adult literature such as censorship, selection criteria, reader-response theories, ethnicity, and gender-based criticism. The prerequisite is waived for students in the Elementary Education Program.

350 **Teaching of Writing** (3). F, A course in the theory and practice of teaching composition in middle and high school writing and language arts programs. Extensive reading complements frequent writing about and practice in all elements involved in teaching writing. Majors and minors in English secondary education programs must take this course before enrolling in Education 346: "Directed Teaching."

351 **Language, Grammar, and Writing for the Elementary Classroom** (3). F, An introduction to several significant and practical aspects of the nature of language, a review of the nature of traditional grammar, including some comparisons of traditional grammar with more recently developed grammars, and an exploration of the relationships between these grammars and composition instruction and practice.

352 **Teaching of Literature** (3). S. A course in the theory and practice of teaching literature in middle and high school language arts programs. Extensive reading of literature along with the study and practice of teaching literature. Majors and minors in English secondary education programs must take this course prior to enrolling in Education 346: "Directed Teaching."

359 **Seminar in Principles of and Practices in Secondary Education** (3). S. A course in

perspectives on, principles of, and practices in the teaching of English on the secondary level. This course should be taken concurrently with Education 346: "Directed Teaching." Before taking English 359, students must pass the English Department Screening Exam and complete English 350, English 352, and Education 302/303. Before taking English 359, students normally also complete Education 307 and 398.

360 **Creative Nonfiction** (3). S. A course in the principles and practice of creative nonfiction. Students will examine a variety of models and engage in extensive practice of the genre. Special emphasis will be given to the relationship between faith and art for the writer. Prerequisite: English 101 or 102.

362 **Creative Writing** (3). F, S. A course in the principles and composition of fiction or poetry. Students will engage in extensive practice. Special emphasis will be given to the relationship between faith and art for the writer. Students may take both the fiction and the poetry version of the course for credit. Normally, this course will alternate between poetry (F) and fiction (S).

365 **Writing in Digital Environments** (3). A course that engages students in writing rhetorically effective digital texts. Students will apply rhetorical, aesthetic, and technical principles as they write extensively in a variety of genres such as blogs, wikis, web pages, and digital stories. Special attention will be paid to questions of authorship and copyright when writing in digital environments. Prerequisite: English 101 or 102.

370 **Linguistics** (3). F, S. A study of some of the more interesting and important characteristics of language, with particular attention given to the processes of language acquisition; to patterns and effects of linguistic change through time; to variations in language from region to region, social class to social class, and gender to gender; and to the assumptions informing the study of various grammars.

371 **History of the English Language** (3). S. An analysis of the changes that have occurred throughout the history of the English language, based on an intensive study of selected British and American texts.

372 **Sociolinguistics and Issues in Language Education** (3). F, A course involving two ma-

for activities: (1) an examination of selected topics that have arisen in recent sociolinguistic research, particularly those topics centering on questions about how standard and nonstandard languages and dialects appear to affect people's educational success; and (2) an evaluation of how these topics should affect approaches to language education, particularly approaches to teaching English as a Second Language (ESL). Prerequisite: English 101 or 102.

**373 Stylistics and Discourse Analysis** (3). S. A course that reviews significant grammatical terms; analyzes how words can be combined into longer constructions in English; examines the kinds of meanings—such as agency, modality, and solidarity—that those constructions can convey; and discusses how patterns of clauses conveying these various kinds of meaning within texts can be related to textual contexts.

**374 English Grammar** (3). I. A study of traditional grammar, focusing on its history, its system, its applications, its competitors, and its connection to prose style; special emphasis will be given to the system and terminology of this grammar.

**375 Grammar for Teachers of ESL** (3). F. A course that reviews the fundamentals of English grammar and examines the possibilities and limitations of teaching grammar in the ESL classroom. Students must research or practice the teaching of some of this grammatical material. Prerequisite: English 101 or 102.

**380 Internship** (3). F, S. A course requiring students to work ten hours per week in a job related to English studies. This practicum asks students to reflect on vocation broadly and to apply theoretical, technical, and ethical principles to their work. Students will work with Career Services to secure a suitable position. Prerequisites: junior or senior status, a 2.0 college and departmental GPA, and permission of advisor.

**390 Independent Study** (3). F, I, and S. Prerequisite: permission of the department chair.

**395 Senior Seminar** (3). F, S. A capstone course for all English majors. This senior seminar is designed to nurture Christian reflection on issues related to writing, language, and literary studies, such as the significance of story and literary expression, the relationship of language and meaning, and the ethical implications of language and story. Students also consider vocational opportunities for those who love words. These contemporary literary and linguistic issues are framed by readings from within the tradition of Christian aesthetic reflection as well as from reformed cultural criticism and theology. Significant written work is required. Prerequisites: English 295, Biblical Foundations I or Theological Foundations I, Developing a Christian Mind, and Philosophical Foundations.

**399 Honors Thesis** (3). F. A substantial work of research and criticism in the field of language or literature or a significant creative project (with an additional critical component), required for those graduating with honors in English.

# English as a Second Language

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These interdisciplinary minors in ESL prepare students to teach English as a second language within the U.S. or abroad. Students in elementary and secondary education programs must fulfill the requirements for the ESL education minor. Students interested in teaching abroad or in programs such as community education, literacy, or church outreach should fulfill the requirements for the non-education minor. Program advisor is M. Pyper (Spanish).

## **ENGLISH AS A SECOND LANGUAGE EDUCATION MINOR**

(22 semester hours)

Speech Pathology and Audiology 216

English 370 or Spanish 340

English 372

English 375

Interdisciplinary 356 (elementary) or 357  
(secondary)

Interdisciplinary 301

Education 303

Notes: Students with the secondary education ESL minor should consider an English major (a 2-course overlap between major and minor is allowed).

IDIS 301 must be taken concurrently with Education 303. Students must complete Calvin's foreign language core requirement.

## **ENGLISH AS A SECOND LANGUAGE NON-EDUCATION MINOR**

(22 semester hours)

Speech Pathology and Audiology 216

English 370 or Spanish 340

English 372

English 375

Interdisciplinary 301

Sociology 253

An advisor-approved elective

# Environmental Science, Environmental Studies

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The environmental science major is intended for students who plan to pursue a career requiring scientific training in environmental problems and their solutions. The major will prepare students for jobs in a variety of fields and will prepare them for further study in certain graduate programs such as ecology, environmental science, natural resource management, or environmental biology. Students choose one of three concentrations: biology, chemistry, or geology. The following advisors will supervise students through the three concentrations: R. VanDragt for biology, M. Muyskens for chemistry, and R. Stearley for geology. Students who wish to pursue graduate study in chemistry or geology, and are interested in environmental issues, are encouraged to complete a disciplinary major and the environmental studies minor.

The environmental studies major serves as a foundation for a broad range of environmental careers, from environmental law to land use planning. Majors choose one of three concentrations: economics, geography, or political science. Majors may also select an alternate concentration with the approval of the environmental studies director, J. Skillen, and an advisor in that field. Students are strongly urged to do an internship as part of the major. The environmental studies minor is intended for students who are following a disciplinary major and who also have an interest in studying environmental problems and issues at the local, national, and global levels. Because the study of such issues is truly interdisciplinary in scope, the environmental studies minor is appropriate for students majoring in the humanities, the social sciences, or the natural sciences. While disciplinary majors with environmental interest are encouraged to complete the entire group minor, the environmental studies courses also may be taken singly as electives to enrich a program of study.

## **ENVIRONMENTAL SCIENCE MAJOR BIOLOGY EMPHASIS**

(57-61 semester hours)

Biology 160  
Biology 161  
Biology 345  
Two approved 300 level biology courses  
Chemistry 103  
Chemistry 104  
Chemistry 253 (or 261 and 262)  
Chemistry 271  
Geology 151, 153 or Geography 120  
Geography 252  
Geology 312  
Recommended electives (not required)  
    Biology 250 and 295 taken concurrently

## **CHEMISTRY EMPHASIS**

(53 semester hours)

Chemistry 103  
Chemistry 104  
Chemistry 201  
Chemistry 253 or 261  
Chemistry 271  
One of Chemistry 262, 304, or 323  
Biology 160  
Biology 161  
Biology 345  
Geology 151 or Geography 120  
Geography 252  
Geology 312  
One of Biology 250 or Geology 212, 304,  
    317, Geography 322, or approved  
    alternative

## **GEOLOGY EMPHASIS**

(53 semester hours)

Geology 151 or 153 or Geography 120  
Geology 152  
Geology 215  
Geology 312  
Geography 252  
Biology 160  
Biology 161  
Biology 345  
Chemistry 103  
Chemistry 104  
Chemistry 253 or 261  
Chemistry 271  
One of Biology 250, Geology 212, 304, 317,  
    Geography 322 or approved alternative

## **Cognates**

(17-21 semester hours)

Environmental Studies 210

Environmental Studies 302

Environmental Studies 395

One sequence from

    Mathematics 132 (or 171) and

    Statistics 143

    Mathematics 171, 172, and Statistics  
    243

In order to be admitted as a major in the environmental science program, a student must have completed three college-level science courses with a minimum grade of C (2.0) in each course and be approved by the committee, which oversees the environmental science program.

Beyond the requirements of the general honors program, the Honors Program in environmental science requires:

1. A cumulative GPA of at least 3.3 in courses contributing to the major.
2. One course taken for honors from Biology 123, 161, Chemistry 103, or Geology 151.
3. One course taken for honors between Environmental Studies 210 or 302,
4. One course taken for honors among Biology 345, Chemistry 271, or Geology 312.
5. Completion of Environmental Studies 395 with honors.
6. Completion of a practical experience through Environmental Studies 385, an independent study (390 course) in biology, chemistry, or geology, or another approved practicum.

## **ENVIRONMENTAL STUDIES MAJOR**

(35 semester hours)

Biology 123  
Biology 160  
Economics 232  
Environmental Studies 210  
Environmental Studies 302  
Environmental Studies 395  
Geography 120 or Geology 151 or 153  
Geography 261  
Political Science 212

## **Cognate**

One from Statistics 143, 243, Psychology 255, or Sociology 255

## **DISCIPLINARY CONCENTRATIONS**

(15-19 semester hours)

Choose five (5) courses within one discipline.

### **Economics concentration options**

Economics 221  
Economics 222  
Economics 325  
Economics 326  
Economics 330  
Economics 339  
Economics 343  
Business 359

### **Geography concentration options**

Geography 110 or 200  
Geography 181  
Geography 230  
Geography 250  
Geology 251  
Geography 252  
Geography 295  
Geography 310  
Geography 322  
Geography 351  
Geography 352  
Geography 361  
Geography 362  
Geography 385

### **Political Science concentration options**

Political Science 101 or 110  
Political Science 202  
Political Science 207  
Political Science 209 or 314  
Political Science 251  
Political Science 276 or 279  
Political Science 308  
Political Science 380

In order to be admitted as a major in the environmental studies program, a student must have completed two courses in the major with a minimum grade average of B- (2.7).

### **MINOR IN ENVIRONMENTAL STUDIES**

(19-21 semester hours)

Environmental Studies 210  
Environmental Studies 302  
Environmental Studies 395  
Geography 261

Two additional courses approved by the program director.

### **COURSES (ENST)**

**210 Human Impacts on the Environment (3).** F, S. As population and affluence have increased and technology's role has grown, human ac-

tivities have transformed natural environments around the globe. This course surveys and examines how a wide variety of human enterprises such as agriculture, industry, recreation, and urbanization have had and continue to have far-reaching environmental consequences everywhere on Earth. These impacts are assessed by standards such as ecological well-being and sustainability, human habitability, and quality of life. Not open to first-year students.

**302 Environment and Society (3).** S. The interactions among population, resources, technology, economics, and public policy are studied in order to understand and address the environmental issues and problems of our day. Attention is focused upon energy, material, and food resource issues as well as upon population and resource relationships. Not open to first-year students. Prerequisite: Environmental Studies 210 or permission of the instructor.

**295 Special Topics (2-3).** Prerequisite: sophomore standing.

**385 Internship in Environmental Studies (3).** F or S. This course is an internship involving field application of the concepts and principles learned as part of the environmental studies supplementary concentration or the environmental science group concentration. A student is placed in a position in a governmental agency, a not-for-profit organization, or a corporate firm, which builds on previous instruction in the student's program of concentration in an area related to environmental matters. Students are assigned a specific project and work under the direct supervision of an employee of the governmental, non-profit, or business entity, as well as under the supervision of the instructor. Prerequisites: Environmental Studies 210, 302, and permission of the instructor.

**395 History and Philosophy of Environmental Thought (3).** S. This course aims to develop a Christian philosophy of the environment and environmental management. Issues, problems, and controversies in environmental ethics are explored. Environmental thought is explored historically, through the perspectives of contemporary environmental movements, and finally from a Reformed, Christian perspective. Prerequisites: Environmental Studies 210 and 302 or permission of the instructor.

# French

Professors O. Selles, J. Vos-Camy (chair)  
Associate Professor V. De Vries

The French Department offers courses of study for students interested in careers in which a world language plays a key role, for those interested in teaching French at the secondary or elementary school levels, and for those interested in continuing work on the graduate level. Programs in the department include major or minor concentrations in French and major or minor concentrations in secondary and elementary education. Approved courses from Calvin's Study in France program may be applied to the program of concentration.

Major and minor students are encouraged to consult the French Department website.

## **FRENCH MAJOR**

(31 semester hours)

French 301

French 302

French 351

One from the francophone world: French/  
STFR 361, 362 or 363

One from French literature: French 394,  
395 or 396

Five electives chosen from any of the following: STFR 315, 316, 330, French/  
STFR 361, 362, 363, French 372, 373,  
374, 375, French/STFR 381, French  
394, 395, 396 or the department's interims  
abroad (W60, W80).

Study in France courses are: STFR 315,  
316, 381, 330, 361, 362, and 363.

Note: STFR 361, 362 and 363 may fulfill either the francophone world course requirement or serve as an elective. Only one of these three courses will be taught in a particular semester abroad.

All majors must take the French Department competency exam preferably in the spring of their senior year.

Note: Students with a double major in Engineering may count Engineering 387, International Engineering Internship, toward a French major or minor when that internship takes place in a French-speaking region or country.

## **FRENCH MINOR**

(19 semester hours)

French 301

French 302

French 351

One from the francophone world: French/  
STFR 361, 362 or 363

Two electives chosen from any of the following: STFR 315, 316, 330, French/  
STFR 361, 362, 363, French 372, 373,  
374, 375, French/STFR 381, French  
394, 395, 396 or the department's interims  
abroad (W60, W80).

## **FRENCH ELEMENTARY/SECONDARY/ K-12 EDUCATION MAJOR**

(31 semester hours)

French 301

French 302

French 351

Interdisciplinary 356 (elementary) or 357  
(secondary)

Interdisciplinary 359 (secondary)

One elective chosen from any of the following: STFR 315, 316, 330, French/  
STFR 361, 362, 363, French 372, 373,  
374, 375, French/STFR 381, French  
394, 395, 396 or the department's interims  
abroad (W60, W80).

All French education majors must complete the study in France program (15 hours): STFR 315, 316, 330, 381, and one from STFR 361, 362 or 363

Note: Only one of the three courses STFR 361, 362 and 363 will be taught in a particular semester abroad.

NOTE: Students intending to qualify for secondary endorsement must take IDIS 357 before student teaching.

NOTE: Students intending to qualify for the K-12 endorsement must take the secondary major and will spend part of the student teaching semester in an elementary setting and part in a secondary setting. They must also take both French 356 and 357 before student teaching.

## **FRENCH ELEMENTARY/SECONDARY EDUCATION MINOR**

(22 semester hours)

French 301

French 302

French 351

Interdisciplinary 356 (elementary) or 357 (secondary)

One from the francophone world: French/STFR 361, 362 or 363

Two electives chosen from any of the following: STFR 315, 316, 330, French/STFR 361, 362, 363, French 372, 373, 374, 375, French/STFR 381, French 394, 395, 396 or the department's interims abroad (W60, W80).

In order to qualify for the elementary or secondary teaching internship in French, all major and minors students are expected to pass, prior to the teaching internship, a departmental competency exam in addition to the competency exam administered by the State of Michigan. French education majors and minors must obtain a minimum score of 80% on the French Departmental competency exam. French education majors and minors are also required to take an external oral proficiency interview in order to be certified. A ranking of Advanced-Low on the ACTFL Proficiency Scale constitutes the minimum required level of proficiency. Directed teaching in French is available only during the spring semester. Students interested in the teacher education options should consult the Teacher Education Program Guidebook, available from the Education Department. To be admitted to the teacher education program, a student must have a cumulative GPA of at least 2.5 in the courses required for the major and/or minor.

Note: In order to obtain Advanced-Low on the ACTFL scale, students are strongly encouraged to participate in the French semester-abroad program or in one of the French interims abroad.

## **COLLEGE CORE LANGUAGE REQUIREMENT**

Completion of French 113, 202 or 203 satisfies the college core foreign language requirement. Students who have not had any prior French may complete the foreign language requirement in four semesters by taking French 101 (fall), 102 (spring), 201

(fall), and 202 (spring). Students may also complete this requirement in one year by taking French 131 (fall), 132 (interim), and 202 (spring). Students who meet the criteria for the Multisensory Structured courses may complete the requirement in one year with French 111 (fall), 112 (interim), and 113 (spring). Students who have had prior French may start with any course in a given sequence according to their ability as measured by the departmental placement exam, and comfort level. Students may also complete the requirement with the Study in France program. See below.

## **OTHER COLLEGE CORE REQUIREMENTS**

The cross-cultural engagement core requirement may be met by the department's W60, W80 interim courses, or by the Study in France program (STFR) 330.

The core literature requirement may be met by French 351 or 361.

The global and historical studies core requirement may be met by French/STFR 362 or 363.

The arts core requirement may be met by French 375.

The integrative studies core requirement may be met by French 394, 395 or 396.

## **Study in France**

Calvin offers an advanced language and literature program and a core language program in Grenoble, France. Through courses taught by the program director and those offered at the Centre Universitaire d'Etudes Françaises (CUEF) of the Université de Grenoble 3 Stendhal, students obtain 15 semester hours of language, literature, and culture credit. The Study in France program allows students to complete the core Cross Cultural Engagement requirement with STFR 330 and the core Global and Historical Studies with STFR 362 or 363. Students have the possibility of completing other core requirements depending on the courses they choose to take at the CUEF French 301 and 302 are prerequisites for the advanced program. French 351 is recommended.

Students with little or no previous French may complete the foreign language core requirement through the Study in France program. Students enroll in intensive language courses at the Centre Universitaire d'Etudes

Françaises of the Université de Grenoble 3 Stendhal and live with host families. In addition to completing the foreign language requirement, students also fulfill the core Cross Cultural Engagement requirement with STFR 330. Students obtain 12 semester hours of language credit and 3 hours of credit for STFR 330 for a total of 15 semester hours.

The advisor for this program is V. De Vries. The program is offered fall 2015 and will be offered again in fall 2017.

## COURSES (FREN)

**101 Elementary French I** (4). F. An introductory course in the comprehension and use of spoken and written French.

**102 Elementary French II** (4). S. Continuation of French 101.

**111 Multisensory Structured French I** (4). F. An introductory course in the comprehension and use of spoken and written French designed to meet the needs of at-risk students. Materials are presented with an emphasis on understanding the nature of language. General language-learning skills are developed as specific world language goals are met. Students are admitted to this course on the basis of adequate documentation of being at-risk. Students in this sequence take French 112 in the interim and complete the core foreign language requirement with French 113 in the spring. Not offered 2015–2016.

**112 Multisensory Structured French II** (3). I. The second course in a three-course sequence of language study designed to meet the needs of at-risk students. Materials are presented with an emphasis on understanding the nature of language. General language-learning skills are developed as specific foreign language goals are met. The course is open to students who are continuing from French 111 and expect to complete through the French 113 level. Not offered 2015–2016.

**113 Multisensory Structured French III** (4). S. The third course in a three-course sequence of language study designed to meet the needs of at-risk students. Materials are presented with an emphasis on understanding the nature of language. Introduction to cultures where French is spoken, including North Africa, West Africa, and Quebec provides the opportunity for understanding how the language and cul-

ture interacts to shape expression in various contexts. The course is open to students who are continuing from French 112. Completion of French 113 satisfies the foreign language requirement. Not offered 2015–2016.

**131 Introductory French** (5). F. This is the first course in a closely integrated sequence of language study involving two semesters and the interim. This course is open to students who have had no previous French or who have completed some high school French but who are not ready for French 201. Students in this sequence take French 132 during interim and complete the foreign language core requirement with French 202 in the spring.

**132 Intermediate French I** (3). I. This is the second course in a closely integrated sequence of language study involving two semesters and the interim. The course is open to students continuing from French 131 as well as students wishing to brush up on their French skills. Students in this sequence complete their foreign language core requirement with French 202.

**201 Intermediate French I** (4). F. Further training in oral and written French, study of the structure of the language, practice in speaking, listening, reading, writing and introductory study of francophone cultures. Students in this course complete their foreign language core requirement with French 202.

**202 Intermediate French II** (4). S. Further training in spoken and written French, study of the structure of the language, practice in listening, reading, and writing, and continuing study of francophone cultures. This course provides insights into the historical, cultural, and sociological contexts which have shaped the French language. Completion of French 202 satisfies the foreign language core requirement.

**203 Advanced Intermediate French** (4). F. An accelerated review of essential grammar topics and vocabulary, as well as practice in speaking, listening, reading, and writing. Students learn about the historical, cultural, and sociological contexts which have shaped the French language. This course is intended for students who are beyond the 201 level but are not yet ready for the advanced level. Completion of French 203 fulfills the foreign language core requirement.

**301 Advanced Conversation** (3). F. This course is designed to develop advanced aural



comprehension skills, as well as continuing competence in spoken French through exercises, conversation in class, and small groups. Prerequisite: French 202, or the equivalent.

**302 Advanced Grammar (3).** S. Systematic study of advanced grammar and composition. Prerequisite: French 202, 203, or the equivalent.

**IDIS 356 Introduction to Elementary World-Languages Pedagogy (3).** F. Theory and practice of teaching world languages in the elementary school. Study of second language acquisition, methodologies, curricula, and programs. Off-campus field experience and observations required. Should be taken in the junior or senior year, prior to student teaching. Required for elementary and K-12 certification in world languages including ESL. Prerequisite: completion of or concurrent registration in Education 302/303.

**IDIS 357 Introduction to Secondary World-Languages Pedagogy (3).** F. An introduction to the major principles and practices of teaching world languages, offering a study of various methodologies and the major controversies associated with them. The course explores how a Christian approach to education affects second-language pedagogy and how this pedagogy interacts with the language learner's personal growth. It also introduces the prospective educator to the teaching of the basic skills, to issues in evaluation and assessment, and to the use of technologies in the language classroom. This course should be taken in the junior or senior year, prior to student teaching. Required for secondary or K-12 certification in world languages including the ESL secondary minor. Prerequisite: completion of or concurrent registration in Education 302/303.

**IDIS 359 Seminar in Secondary Foreign Language Pedagogy (3).** S. A seminar reinforcing the major principles and practices of foreign language pedagogy on the secondary level for students during their student teaching internship. The course will provide an opportunity for collaborative work on putting theoretical and pedagogical matters of immediate concern into a practical framework. This course is required concurrently with Education 346. This course does not count as part of the major or minor program. Prerequisites: Education 302/303, concurrent registration in

Education 346, and successful completion of the department competency exam.

### Literature and Civilization

**351 Survey of French Literature (4).** S. An overview of selected major writers, movements, and genres from the Middle Ages to the present. Conducted mainly in French. This course fulfills the core literature requirement. Prerequisite: French 301 or 302.

**361 Francophone Literature and Culture in Quebec (3).** An introduction to French-language culture and society in Quebec. Conducted mainly in French. This course fulfills the core literature requirement. Prerequisite: French 301 or 302, French 351 recommended. Not offered 2015–2016.

**362 Francophone Literature and Culture in Sub-Saharan Africa and the Diaspora (3).** An introduction to representative writers and works of French expression from Sub-Saharan Africa and the African Diaspora. Conducted mainly in French. This course fulfills the core global and historical studies requirement. Prerequisite: French 301 or 302, French 351 recommended. Not offered 2015–2016.

**363 Francophone Literature and Culture in North Africa (3).** F. An introduction to representative writers and works of French expression from the Maghreb. This course fulfills the core global and historical studies requirement. Conducted mainly in French. Prerequisites: French 301 or 302, French 351 recommended.

**372 French Linguistics (3).** An introduction to French linguistics, including phonetics and phonology, morphology and syntax, lexicology and derivational morphology, pragmatics, and historical perspectives. Conducted mainly in French. Prerequisite: French 301 or 302. Not offered 2015–2016.

**373 French for International Business (3).** An introduction to French business concepts and structures in a contemporary context. Various aspects of the French economy (transportation, trade, banks and the European Union) as well as French business practices and language nuances in Quebec will be studied. This course develops proficiency in written and oral communication in French in a business context. Students will have the opportunity to earn the Diplôme de Français

des Affaires conferred by the Chambre de Commerce et d'Industrie de Paris. Conducted mainly in French. Prerequisite: French 301 or 302. Not offered 2015–2016.

**374 Women and Gender in French Literature and Culture (3).** An introduction to women's writing from the Middle Ages to the present. Conducted mainly in French. Prerequisite: French 301 or 302, French 351 recommended. Not offered 2015–2016.

**375 French Cinema (3).** This course introduces French Cinema from the silent era to the present. Conducted mainly in French. This course fulfills the Arts core requirement. Prerequisite: French 301 or 302, French 351 recommended. Not offered 2015–2016.

**381 Special Topics (3).** S. For spring 2016 the theme of this course is World War II France in literature and film. Conducted mainly in French. Prerequisite: French 301 or 302, French 351 recommended.

**394 Medieval and Early Modern French Literature (3).** One of three possible capstone courses in the French major, this integrative studies course is designed to nurture Christian reflection on issues related to

French literary studies of narrative, theater and poetry in France from the Middle Ages to the end of the 17th century. This course fulfills the integrative studies core requirement. Prerequisite: French 351. Conducted in French. Not offered 2015–2016.

**395 French Literature Before and After the French Revolution (3).** S. One of three possible capstone courses in the French major, this integrative studies course is designed to nurture Christian reflection on issues related to French literary studies of narrative, theater and poetry in France from the beginning of the 18th century to the end of the 19th century. This course fulfills the integrative studies core requirement. Prerequisite: French 351. Conducted in French.

**396 Contemporary French Literature and Thought (3).** One of three possible capstone courses in the French major, this integrative studies course is designed to nurture Christian reflection on issues related to literature in France from the twentieth century to the present. This course fulfills the integrative studies core requirement. Prerequisites: French 351. Conducted in French. Not offered 2015–2016.

## Gender Studies

An interdisciplinary minor, gender studies focuses on gender issues and relations, locating them within a Christian worldview. The minor consists of six courses taken from at least four different departments. No more than one interim is allowed in the minor. The program director is C. Van Dyke (Philosophy). Program advisors include: C. Anderson (Chemistry), C. De Groot (Religion), K. DuMez (History), Stacey Wieland (Communication Arts and Sciences), R. Groenhout (Philosophy), M. Mulder (Sociology and Social Work), J. Yonker (Psychology).

### GENDER STUDIES MINOR

(18 semester hours)

Interdisciplinary 394

Three courses drawn from regularly offered gender-focused courses

Two additional gender-focused courses or two gender-cognate courses

### Gender-focused courses

Three from the following:

Communication Arts and Sciences 270, English 234, French 374, German 372, History 376, Philosophy 211, Psychology 222, Sociology 250, approved gender-focused interim (e.g. "Gender Representation in American Film," "Vamps and Vixens," "Male Bodies in Contemporary Culture")

### **Gender-cognate courses**

Two from the following:

Any special topics, gender centered courses, such as: History 362, Religion 313, Sociology 304, Sociology 316, or a negotiated gender-cognate course.

A gender cognate course is one in which the student negotiates a contract in a non-gender focused class to add a significant and theoretically focused gender component to normal class requirements. These components may include, but are not limited to, additional readings and guided research of a typical paper. These additional components could factor into an honors contract. The course professor must be committed to providing guidance in

the area of gender analysis as it affects the content of the course. The contract should be developed in consultation with the director of the gender studies minor.

*Only one interim course may count towards the minor.*

### **COURSES**

IDIS 394 **Gender Studies Capstone** (3). S. An integrative course that builds on previous work in the minor, focusing particularly on current research, theory, and controversies in the field. Special attention will be paid to nurturing mature Christian thinking on gender issues.

## **Geology and Geography**

*Professors J. Bascom, M. Bjelland, R. Sparks, R. Stearley, D. van Dijk (co-chair), Associate Professor J. VanHorn (co-chair)  
Assistant Professors K. Bergwerff, J. Skillen*

Programs in the department include a major and a minor in geology, a major in environmental geology, a major and a minor in geography, a major and minor in environmental studies, a major in environmental science (geology focus) as well as majors and minors for teacher education programs. Group majors consisting of geology, chemistry, engineering, or physics are also available.

### **GEOLOGY MAJOR**

(37-40 semester hours)

Geology 151 or 153 or Geography 120

Geology 152

Geology 212

Geology 215

Geography 252

Geology 316

Geology 317

Geology 387

Two electives from Geology 251, 304, 312, 313, 325, 351, 386, 390, 395, 396, Geography 181, 261, 322, 361 or an approved interim course.

Physical science senior capstone course, typically IDIS 310

### **Cognates**

(8 semester hours)

Chemistry 103

Statistics 143 or Mathematics 171

Students who desire a BS degree must complete a minimum of 58 semester hours of science and mathematics. Students who wish to pursue a career or graduate study in geology and who desire a BS degree must complete the minimum requirements of the geology major and should also take the following courses:

Chemistry 104 or Engineering 106

Computer Science 106 or Geography 261

Physics 133

Math 172

English 261

Geology field methods course

### **ENVIRONMENTAL GEOLOGY MAJOR**

(51-52 semester hours)

Geology 151 or 153 or Geography 120

Geology 152

Geology 215

Geography 252

Geology 304  
 Geology 312  
 Geology 317  
 Geology 387  
 Geography 261  
 Environmental Studies 210  
 Environmental Studies 302  
 Environmental Studies 385 or field course  
 Environmental Studies 395  
 Two electives from Chemistry 253, Engineering 306, Geology 212, 251, 316, 325, 351, Physics 133 or Geography 181, 322, 361

**Cognates**

(16 semester hours)  
 Chemistry 103  
 Chemistry 104 or Engineering 106  
 Mathematics 171 or Statistics 143  
 Mathematics 172 or 132

**GEOLOGY MINOR**

(23-24 semester hours)  
 Geology 151 or 153 or Geography 120  
 Geology 152  
 Geology 215  
 Three electives from Geology 212, 251, 304, 312, 313, 316, 317, 325, 351, 386, 390, 395, 396, Geography 181, 252, 261, 322

**Cognate**

(4 semester hours)  
 Chemistry 103

**SECONDARY EDUCATION  
 EARTH/SPACE SCIENCE MAJOR**

(46-51 semester hours)  
 One from Geology 151, 153, or Geography 120  
 Geology 152  
 Geology 212  
 Geology 215  
 Geology 251  
 Geography 250  
 Astronomy 211  
 Astronomy 212  
 Science Education Studies 214  
 Science Education Studies 314  
 Science Education Studies 359  
 An approved elective

**Cognates**

(8-12 semester hours)  
 Mathematics 132 or 171  
 Chemistry 103  
 One course in college or high school physics

**SECONDARY EDUCATION  
 EARTH/SPACE SCIENCE MINOR**

(27 semester hours)  
 One from Geology 151, 153, or Geography 120  
 Geology 152  
 Geology 251  
 Geography 250  
 Astronomy 211  
 Astronomy 212  
 Science Education Studies 214

**Cognates**

(4 semester hours)  
 Mathematics 132 or 171  
 One course in college or high school physics

**GEOGRAPHY MAJOR**

(at least 36 semester hours)  
 Geography 120 or Geology 151 or 153  
 Geography 200  
 Geography 230  
 Geography 252  
 Geography 261  
 Geography 310  
 Geography 380  
 Environmental Studies 210  
 Departmentally approved electives to bring the total to at least 36 hours, including one elective at the 300-level.

**Cognates**

(4 semester hours)  
 One from Mathematics 132, 143, 171, Psychology 255 or Sociology 255.  
 All geography majors must complete two semesters of Geography 190 and one semester of Geography 290.

**GEOGRAPHY MINOR**

(18 semester hours)  
 One from Geography 120, Geology 151, or 153  
 Geography 200  
 Departmentally approved electives to bring the total to at least 18 hours, including one elective at the 300-level.

**ENVIRONMENTAL SCIENCE MAJOR**

See environmental science

**ENVIRONMENTAL STUDIES  
 MAJOR AND MINOR**

See environmental studies

## **SECONDARY EDUCATION GEOGRAPHY MINOR**

(23 semester hours)

Geography 120

Geography 243

Environmental Studies 210

Interdisciplinary 375

Six hours of electives: See *Teacher Education Guidebook* for list of applicable electives

## **SECONDARY SOCIAL STUDIES GROUP MAJOR**

(40 semester hours)

Economics 221

Economics 222

Environmental Studies 210

Geography 243

History 151

History 152

History 229

History 359

Political Science 101

Political Science 202

Interdisciplinary 205

Interdisciplinary 375

Students pursuing the secondary social studies major must also complete a history major or a minor in economics, geography, or political science. Courses are allowed to overlap between the social studies major and the disciplinary major or minor.

## **ELEMENTARY SOCIAL STUDIES GROUP MAJOR**

(39 semester hours)

Economics 221

Economics 222

Geography 243

History 151

History 152

History 229

Political Science 101

Political Science 202

Interdisciplinary 205

Education 305

Elective

Advisor approved Geography elective

## **ELEMENTARY AND SECONDARY INTEGRATED SCIENCE STUDIES**

Students in the elementary or secondary education program wishing to major or minor in science should consult the Science Education Department of the catalog.

## **GROUP MAJORS IN GEOLOGY AND GEOGRAPHY**

A group major meets the needs of some students, particularly those in professional programs. Such group majors require twelve courses, ten of which must be from two departments with no fewer than four from either, and the remaining two courses chosen from a third department. The chairs of the three departments involved must approve such programs.

## **MAJORS IN GEOLOGY AND GEOGRAPHY**

The core requirement in the physical sciences may be met by Geography 120, Geology 151, Geology 153, Geography 181, Geography 250, Geology 251, both science core requirements may be met by Geology 151-152.

## **COURSES**

### **Geography (GEOG)**

**110 World Regions** (4). F, S. An analysis of Earth's principal culture regions from a geographic perspective: Africa, Europe, Russia, North Africa and Southwest Asia, East Asia, South Asia and Southeast Asia, Australia and New Zealand, Oceania, Caribbean, and Latin America. These areas will be examined in the light of several foundational geographic themes: the locational organization of physical and cultural features, society-land relationships, cultural landscapes, and patterns of spatial interaction among and within regions.

**120 Earth Systems** (4). F, S. This course includes an introductory study of physical systems and historical processes that shape the surface of Earth. Topics include: 1) The physical nature of Earth's surface based on composition of Earth materials and the forces that create landforms, 2) weather and climatic systems and their effect on the global distribution of soils and ecological communities, and 3) the oceans. Understanding of Earth systems is applied to concepts of stewardship, resource use, and energy consumption. Laboratory. Not open to students who have completed Geology 112, 151, or 153. Not offered Fall 2015.

**181 First-Year Research in Earth Sciences: Dunes** (5). F First-semester Calvin students are immersed in undergraduate research experiences focused on Lake Michigan coastal dunes. Classes cover topics ranging from the

contemporary understanding of Great Lakes coastal dune forms and processes to human interactions with coastal dunes to the practices of science. In the first part of the course, students gain experience in the process of scientific enquiry and appropriate methods of field-data collection and data analysis during directed research experiences at dune sites. Then teams of students design and implement investigations of contemporary research questions about Lake Michigan coastal dunes. Student research activities are supported by upper-level student research mentors. Three 50-minute classes and one five-hour lab period weekly.

**190 Colloquium** (0). F, S. This course gives students a broad overview of the fields of geography, geology, and environmental studies through presentations by guest lecturers, faculty members, and students as well as focused discussions about vocational choices, professional opportunities, films, and critical issues in the department's three disciplines. Students are expected to pose questions to the specialist(s) who present. This course must be taken at least two times by geography majors.

**200 People, Place and Community** (3). F. Explores the role of humans in the context of their inhabitation of the earth. Humans create spatial landscapes and patterns in their interaction with the natural environment, through their economic activities and as expressions of their cultural values. Individual responses to these spatial patterns are expressed in their sense of place and assessment of risk related to cultural and natural landscapes. The tools of human geography involve the interpretation of these cultural landscapes, including settlement and land use patterns, religion, language, ethnicity, population flows and structures, interactions between culture and nature, and political boundaries, as well as the study of the understanding of behavioral responses to these landscapes.

**210 Human Impacts on the Environment** (3). F, S. (Now listed as Environmental Studies 210)

**230 The Global Economy** (4). F, alternate years. This course examines the changing geography of economic activity within the contemporary world economy. Its main foci include perspectives on globalization, processes of economic change, patterns of world economic activity, and prospects for the future of economic geography. All four sectors of the

economy—agriculture, manufacturing, services, and information-based transactions—are covered. Theoretical concepts are grounded by way of case illustrations that focus on representative places and people in the global economy. Students develop skills for doing social research. Prerequisite: Geography 200, Geography 110 or one social science course.

**240 Latin America** (3). F, alternate years. A survey of the geography of Latin America with an emphasis on the region's physical, cultural, and economic diversity and with a particular focus on issues of development and poverty. Emphasis is put on historic migrations, physical resources, and relative location in the understanding of the formation of regional patterns. Not offered in 2015–2016.

**242 Africa** (3). S, alternate. A survey of the geography of Africa with a focus on the region's physical, cultural, and economic diversity. Featured emphases include the historical experience of colonialism, challenges of environmental degradation, spatial patterns of forced and voluntary migration, intensification of poverty under structural adjustment programs, and the quest for successful development practices.

**243 The United States and the World** (3). F, S. This course is a geographic survey of major world regions with a strong emphasis on the United States. Students analyze geographic factors that shaped the settlement of the United States; interpret cultural, social, environmental, economic and geopolitical processes in world region; better understand the strong economic relationships between the "1st World" and the rest of the world; and appreciate "culturally distant vantage points" posed by regions outside the US. The course is designed to address the Michigan Social Studies Standards for Elementary Teachers. Note: Core requirements may not be met by this course.

**250 Meteorology** (4). S. This course is a study of the atmosphere and the complex processes that control weather and climate. Special attention is given to: The different forms of energy that are operative in the atmosphere and how these control temperature, the various optical phenomena that are observed in the atmosphere, the hydrologic cycle and the mechanisms of cloud formation and precipitation, air pressure and the winds that result from its

differences at the surface and aloft, and the formation of air masses and their movement as frontal systems. Human interactions with atmospheric processes will be examined, including the topics of air pollution, hurricanes, tornadoes, ozone depletion, global warming, acid rain, and photochemical smog. Laboratory.

251 **Oceanography** (4). F, alternate years. (Now listed as Geology 251)

252 **Geomorphology** (4). F The investigation of landforms and the processes which cause them. This course studies the erosional and depositional features resulting from rivers, glaciers, and wind, as well as coastal, gravitational, and weathering processes. Landforms are described and classified from field observations, topographic maps, and aerial photographs. Explanations of the landforms are offered through quantitative modeling of the processes. Laboratory, field trips. Prerequisites: Geography 120 or Geology 151 or 153.

261 **Geographic Information Systems and Cartography** (4). F, S. Focus on geographic information systems (GIS) and the art and science of mapping for spatial analysis. Map design techniques and visual communication using GIS vector and raster data forms will be explored, as well as a variety of methods for analyzing spatial relationships. Topics include those of the physical world and landscape, social justice, poverty, and a significant project on atlas creation for developing countries. This course has a lecture and lab component and lab work will give practical experience to students using the ArcGIS suite. Students will complete a GIS project tailored to their disciplinary interest.

290 **Seminar** (0). F, S. This course gives students a broad overview of the fields of geography, geology, and environmental studies through presentations by guest lecturers, faculty members, and students as well as focused discussions about vocational choices, professional opportunities, films, and critical issues in the department's three disciplines. Students are expected to pose questions to the specialist(s) who present. This course meets concurrently with Geography 190, but is more advanced than the student colloquium. Each student is required to make a presentation on an approved research topic with guidance from a department faculty member. This

course must be taken at least one time. Prerequisite: at least one semester of Geography 190.

295 **Special Topics in Geography** (2-3). Prerequisite: sophomore standing.

310 **Urban Geography** (4). F A study of the spatial organization of cities and systems of cities. Both the internal structure and external relations of cities receive attention. The historic and present-day spatial organization of infrastructure, economic life, social activities, ethnicity, institutions, and politics are examined. Prerequisite: Geography 110 or 200 or one social science course.

322 **Coastal Geomorphology** (4). S, alternate years. This course examines the nature and development of coastal landforms and the processes responsible for change in the coastal zone. Topics include waves, currents, tides, wind, changing sea levels, and the coastal environments of beaches, dunes, estuaries, and rocky coasts. Coastal land use and hazards, shoreline protection, and coastal stewardship will be discussed. Great Lakes coasts are emphasized. Laboratory and field trips. Prerequisite: Geography 252.

351 **City and Regional Planning** (3). F, alternate years. A survey of the practice of urban and regional planning including its theory, history, techniques, issues, and careers. Land use planning and zoning, housing and community development, environmental planning, recreation planning, health care systems planning, transportation planning, historic preservation and urban design, and other subfields are examined within neighborhood, downtown, suburban, regional, and Third World contexts. Prerequisites: Two 200-300-level social science and/or geography courses or department approval.

352 **Urban Planning for Sustainable Communities** (3). S, alternate years. In this course we examine the relationship between the built environment and the natural environment and explore ways to make cities more livable, equitable, and ecologically sustainable. We study key thinkers and movements in urban-environmental planning, paying particular attention to garden cities, New Towns, the New Urbanism, and eco-communities. Topics for exploration include transportation and land use, sustainable food systems, reclamation of

derelict land, regional planning, and ecological design for buildings and whole neighborhoods.

**361 Advanced Geographic Information Systems** (4). S. This course introduces advanced themes in Geographic Information Systems including spatial database design, spatial algorithms, implementation and design, and advanced GIS applications including designs for community development and service tailored to individual students' major field of study. Prerequisites: Geography 261 with the grade of C or better.

**362 Remote Sensing of Earth** (4) F, alternate years. This course provides an introduction to remote sensing of Earth. During the semester students engage in the physics and technical aspects of photogrammetry and satellite imagery for the study of physical and human created aspects of Earth. This course includes a laboratory component as an integral learning method using Erdas Imagine software. Topics covered in this course range from aerial photography to analysis of 3D models of terrain to the sustainability of sprawl in urban systems. Multiple themes of application will be discussed. Prerequisite: Geography 261.

**380 Seminar in Geographic Thought** (3). S, alternate years. This course includes a study of significant episodes and crucial issues in the history and philosophy of geography with an emphasis on present-day human geography. The philosophical underpinnings of geography's domains and paradigms are critically examined. This seminar requires geography majors to reflect on integrating their geographical knowledge and fitting this into a Reformed worldview. Prerequisite: junior or senior standing in the geography program.

**385 Internship in Geography** (3). F, S, or SS. This course is an internship involving professional application of the concepts and principles learned as part of the geography program. A student is placed in a government agency, a private firm, or a not-for-profit organization, which builds on previous instruction in the program in an area of applied geography, such as urban and regional planning, mapping, and geographic information systems. Students are assigned a specific project and work under the direct supervision of an employee of the outside agency or firm as well as under the supervision of the instructor. Prerequisites: senior

standing in the geography major or permission of the geography faculty.

**390 Independent Study**. F, I, and S. Prerequisite: permission of the department.

**395 Research in Geography** (2). F, I, and S. Field or library research on an approved geographical problem and presentation of the results of this research in a seminar. Open to qualified students by permission of the department.

### Geology (GEOL)

**120 Earth Systems** (4). F, S. Now listed as Geography 120. Not offered fall 2015.

**151 Introduction to Geology** (4). F, S. This course is a study of the materials and processes of Earth leading to a responsible Christian appreciation for and stewardship of Earth. Topics include minerals and rocks, Earth's interior and surface structure, surface processes producing landforms, geological time and principles for interpreting Earth history, mineral resources and fossil fuels, and geological hazards such as earthquakes, volcanoes, floods, landslides, and groundwater pollution. Laboratory. Not open to students who have completed Geography 120, Geology 112, or 153.

**152 Historical Geology** (4). S. The first portion of this course traces the development of the study of Earth through the past few centuries, as geology became a true scientific discipline and as its practitioners became convinced of Earth's antiquity. Attention is given to relating views of Earth's history to the Genesis record. During the remainder of the course, evidence for the particulars of Earth history, with emphasis on North America, is outlined. Topics include the origin of Earth and its moon, the origin of continents and ocean basins, rock deformation caused by plate motion and the creation of mountain ranges through history, and sedimentary deposits of intercontinental seas. The laboratory builds on rock classification and map techniques introduced in Geology 151. Prerequisite: Geology 151 or equivalent.

**153 Big Sky Geology: Montana Field Experience** (4). (Field version of Geol-151; offered in May/June). See course description below under May Interim courses.

**212 Structural Geology** (4). S, alternate years. An analysis of common geological structures such as folds, faults, joints, and foliations, in-



quiry into the means by which these structures are formed from stresses within Earth, methods of constructing and interpreting geological maps and cross sections, and introduction to field-mapping techniques. Laboratory, field trip. Prerequisite: Geology 152 or concurrently.

**215 Mineralogy** (4). F, alternate years. A study of minerals and crystal structures with an emphasis on the silicates. The composition, crystal symmetry and geologic occurrence of minerals are discussed along with mineral structures, chemistry, mineral associations and mineral genesis. Crystal morphology and mineral identification are important topics, especially in lab. Laboratory. Prerequisites: Geology 151 or 153 or Geography 120 and Chemistry 103 or concurrently.

**251 Oceanography** (4). F, alternate years. This survey course includes: The history of marine exploration, the nature of the ocean floor, including submarine volcanoes, oceanic crust, sea-floor spreading, and marine sediments, coastal geomorphic processes, the properties of seawater, the nature of tides and currents, ecological marine biogeography, including marine plankton, deep-water biota, coral reef communities, and estuarine and intertidal marine communities, and stewardship of marine resources. Laboratory, field trips. Prerequisite: high school chemistry and sophomore standing.

**252 Geomorphology** (4). F (Now listed as Geography 252)

**304 Geochemistry** (3). F, alternate years. This course studies Earth's major geochemical systems with particular attention to water and rock systems. Topics include fresh and marine water, including groundwater, mineral crystallization and weathering, organic geochemistry, and the application of geochemistry to forensic pollution studies. Stable and radiogenic isotope systematics are reviewed and applied to geological problems and issues. Prerequisites: Chemistry 104 and Geology 215 or 151, or permission of the instructor. Not offered in 2015–2016.

**312 Environmental Geology** (4). S, alternate years. Use of geologic methods and interpretations in understanding and resolving geologic problems relating to the environment. Emphasis on energy systems and global impacts, including fossil fuels and renewable energy resources, mineral and water

resources, and geologic hazards associated with landslides, earthquakes and volcanic events. Pollution from hydrocarbons and mineral/chemical constituents and environmental cleanup issues are discussed. Laboratory. Prerequisite: Geography 252.

**313 Paleontology** (4). S, alternate years. A study of the organisms that once lived on the Earth. Includes an examination of the processes of preservation and methods of discovering the structure, habitat, and relationship of those organisms, and a review of their distribution and life history. A broad spectrum of organisms is studied with emphasis on invertebrate animals. Lectures, laboratories, field trip. Also listed as Biology 313. Prerequisite: Geology 152 or Biology 160 and 161.

**316 Igneous and Metamorphic Petrology** (4). S, alternate years. This course addresses the origin, emplacement, occurrence and tectonic context of igneous and metamorphic rocks. Mineral and rock compositions and chemistry, textures, classifications and phase relationships are studied. The principles of Optical Mineralogy and use of the petrographic microscope is emphasized in lecture and lab. Lab work utilizes the petrographic microscope and hand samples for rock and mineral descriptions and genetic interpretations. Laboratory. Prerequisite: Geology 215.

**317 Sedimentation and Stratigraphy** (4). F, alternate years. This includes the study of the classification and origins of sedimentary rocks with emphasis on the physical, chemical, and biological processes responsible for the origin, deposition, and diagenesis of sediments, with particular attention to modern depositional analogs, an investigation of the use of thin-section petrography in the interpretation of the genesis of sedimentary rocks, and graphical techniques for depicting the geometries of layered sedimentary rocks in outcrop and subsurface. Laboratory, field trips required. Prerequisite: Geology 215 or concurrently.

**322 Coastal Geomorphology** (4). S, alternate years. (Now listed as Geography 322.)

**325 Hydrogeology** (4). F, alternate years. This is an upper-level, pre-professional course, providing preparation in fundamental principles and practical applications of groundwater occurrence, flow, quality, extraction, and remediation. The course will examine signifi-

cant water resource and pollution issues in urban and developing areas, and will address needs for clean and adequate water supplies in poor and remote areas of the world. Laboratory and field trips. Prerequisites: Chemistry 103 plus Geography 252 or Engineering 306 or Engineering 320. Mathematics 132 or 171 strongly recommended.

351 **Geology Field Methods** (3). S, alternate years. **Geology Field Methods** teaches basic field observation, identification, and mapping skills for advanced students in Geology programs. Several on-campus preparatory sessions in April precede the 2-week May field portion in SW Montana. We visit superb exposures of many varieties of igneous, metamorphic and sedimentary rocks, as well as outstanding examples of normal and thrust faulting. We examine a variety of active and inactive mines including copper, gold, silver, and talc deposits, and study the environmental impacts of mining. After a study of the regional stratigraphy, a mapping project focuses on complex structure and rock deformation and teaches field mapping techniques. Most of the class will be in the field with daily trips. Longer excursions will visit volcanic exposures in Idaho and Wyoming, including Craters of the Moon National Monument and Yellowstone National Park. NOTE: The field portion of this course is two weeks immediately following spring commencement. A fee applies.

386 **Seminar in Geology** (2). A survey of the historical development of geology as a science and an examination of the principles and practice of geology from a Reformed perspective. Prerequisite: senior status in the major concentration in geology or permission of the instructor. Not offered in 2015–2016.

387 **Geology as Vocation** (1). F, alternate years. This course examines the job market in the Geosciences and considers job and graduate school options for students after graduation. Topics include seeking to discover God's call, career options and necessary qualifications, and career issues geologists encounter. Students make personal evaluations, complete a resume and set career goals. Outside professionals are interviewed. Course is graded pass/fail. Prerequisite: junior or senior standing or permission of the instructor.

390 **Independent Study**. F, I, and S. Prerequisite: permission of the department.

395-396 **Research in Geology** (2-4). F, I, and S. Field and/or laboratory research on an approved geological problem and presentation of the results of the research in seminar. Open to qualified students by permission of the geology faculty.

### May Interim Courses

112 **Earth Science for Educators** (4). May interim, alternate, odd years. An introductory study of physical systems and historical and contemporary processes that shape the surface of Earth. Topics include 1) the physical nature of Earth's surface based on composition of earth materials and the forces that create landforms, 2) weather and climatic systems and their effect on the global distribution of soils and ecological communities, and 3) the Earth/sun/moon system. Understanding of Earth systems is applied to concepts of stewardship, resources use, and energy consumption. Laboratory, multiple field trips. Not open to students who have completed Geology 151 or Geography 120. This course is designed for students in the education program. Not offered in 2015–2016.

153 **Big Sky Geology: Montana Field Experience** (4). (Field version of Geology 151; offered in May/June). This course in geology is based in southwest Montana. Southwest Montana offers superb field exposures and is within driving distance of outstanding geological localities including Yellowstone National Park and Craters of the Moon National Monument. This course fulfills the physical science core requirement, and emphasizes outdoor, field-based investigation and learning. Students will be introduced to the breadth of geological study leading to responsible Christian appreciation and stewardship of Earth, including rocks and minerals, landforms and surficial processes, geological hazards, and natural resources. Field activities are an important part of each day and the field experience will complement morning lecture and lab activities. As a graded course, exams will cover lecture and text, and students will be required to complete lab assignments, construct a written field log, and choose a special field project. Course includes four evening sessions in April. Not open to students who have completed Geography 120, Geology 151 or Geology 112.

# German

Professors H. De Vries, D. Smith

Associate Professors P. Dykstra-Pruim, \*\*C. Roberts (chair)

The German major and minor draw together language learning, intercultural skills and exploration of German cultural expressions such as literature, film, visual media and online texts. Calvin-sponsored abroad programs are available in Germany and Austria for the interim, a semester, the academic year, or the summer. Students interested in such programs should work out the details with the department chair, the director of off-campus programs, and the office of academic services.

The college foreign language core requirement may be met by German 202 or completion of the core language track of the semester abroad program in Vienna, Austria. For German courses that fulfill other core categories, see below.

## GERMAN MAJOR

(30-31 semester hours)

German 301

German 302

German 303

German 361

German 395

Five electives (at least 15 hrs) numbered 202 or higher, one of which may be the German Interim Abroad

## GERMAN MINOR

(18-19 semester hours)

One or more from German 301, 302 or 303

Five electives (at least 15 hrs) numbered 202 or higher, one of which may be the German Interim Abroad

## GERMAN ELEMENTARY AND SECONDARY EDUCATION MAJOR

(30 semester hours)

German 301

German 302

German 303

German 361

German 395

Four electives (at least 12 hrs) numbered 301 or higher, one of which may be the German Interim Abroad.

IDIS 356 (elementary) or IDIS 357 (secondary)

IDIS 359 (secondary only)

Note: German education majors must participate in an abroad experience in a German speaking country. The German Interim Abroad can meet this requirement, though, a semester abroad program or summer work or apprenticeship program are highly recommended in addition.

## GERMAN ELEMENTARY AND SECONDARY EDUCATION MINOR

(21 semester hours)

German 301

German 302

German 361

Three electives (at least 9 hrs) numbered 301 or higher, one of which may be the German Interim Abroad  
IDIS 356 (elementary) or IDIS 357 (secondary)

Students in teacher education must pass the test administered by the State of Michigan. They must also pass an Oral Proficiency Interview. A rating of Advanced - Low on the ACTFL Proficiency Scale constitutes the minimum required level of proficiency. For details and for information on cost and scheduling see the chairperson. Additional criteria for approval for the teacher education program are found in the *Teacher Education Program Guidebook*, available in the Education Department.

## College foreign language requirement

Completion of German 202 satisfies the college core foreign language requirement. Students who have not had any prior German may complete the foreign language requirement in three semesters and an interim by taking German 101 (spring), 102 (fall), 122 (interim), and 202 (spring). Students without prior German may also complete the foreign language requirement in one year by taking German 121 (fall), 122 (interim), and 202 (spring). Students who have had prior German may start with any course in a given sequence according to their ability and comfort level.

### Other college core requirements

The Cross-Cultural Engagement core requirement may be met by German W80 (German Interim Abroad).

The core Literature requirement may be met by German 303.

The Rhetoric and Culture core requirement may be met by German 362.

The Arts core may be met by German 371.

The Integrative Studies core requirement may be met by German 395.

### German-language abroad opportunities

Calvin offers or sponsors many abroad opportunities in German-speaking Europe. The semester in Vienna, Austria, preceded by one or two months of intensive language learning in Germany, offers both an advanced language, literature and culture track and a core language track for a semester, or the entire year. The core language track requires no prior knowledge of German and can be completed in a semester. On this program students typically accumulate 18-24 semester hours of credit in a semester. Much of what is taken in the advanced track may count toward the German major or minor.

The German Interim Abroad (W80), offered every January, is a four-week course in Germany with homestays in families, interaction with Germans in social institutions (schools, churches and governmental agencies, etc.), and visits to historical sites and cultural events. A Calvin professor prepares the students for cross-cultural interaction before departure, accompanies them throughout, and leads students in reflection on their experience. German 301 or an approved equivalent is the prerequisite for participation on the GIA.

Other abroad opportunities that are regularly available, but must be arranged individually, are the summer work exchange and the summer internship program, both of which typically last 8-12 weeks and take place at sites across Germany.

### COURSES (GERM)

**101 Elementary German I** (4). S. An introductory course in German language and culture that includes an investigation of cultures of German-speaking countries and training in intercultural skills. The course serves as the first course in a sequence for

students with no prior knowledge of German. Students taking German 101 continue with 102 in the fall followed by 122 during interim and 202 in the spring. Students without prior experience with German wishing to begin their language in the fall semester may alternatively enroll in the three-course, accelerated sequence 121-122-202.

**102 Elementary German II** (4). F. Continuation of German 101. Prerequisite: German 101.

**121 Introductory German** (4). F. An accelerated introductory course in the German language and culture that includes an investigation of cultures of German-speaking countries and training in intercultural skills. The course serves as both a fast-paced introduction to German for students with no prior knowledge of the language, and as a systematic review and consolidation for students who have taken high school German but who, on the basis of a placement test, are not prepared for German 201. Students taking German 121 continue with 122 during interim and complete the foreign language core requirement with German 202 in the spring.

**122 Introductory / Intermediate German** (3). I. Continuation of German 102 and 121. Further development of skills in speaking, listening, reading and writing German. Includes investigation of cultural topics, German history, and a study of a variety of texts. Prerequisite: German 102 or 121.

**201 Intermediate German I** (4). F. Further development of skills in speaking, listening, reading, and writing German. Includes systematic grammar review, cultural topics and study of a variety of short literary texts. Prerequisite: German 102 or placement test

**202 Intermediate German II** (4). S. Continuation of German 122 or 201. Completion of 202 fulfills the core foreign language requirement. Prerequisite: German 122 or 201.

### Culture and Literature

**301 Advanced German Language and Culture** (3). F. This course is designed to develop advanced speaking and oral comprehension skills and to prepare students culturally for living short- or long-term in a German-speaking culture. Course materials engage important themes in German history of the

20th and 21st centuries and key issues in contemporary German society. Prerequisite: German 123 or 202.

**302 German Culture and Intercultural Studies** (3). F odd years. The focus of this course is on cultural learning, intercultural skill building, and cultural intelligence. Through exploration of German cultures, comparisons between German and US American cultures and reflection on cultural identities, students will build their cultural intelligence while improving their German language skills. Key themes include Heimat, history, religion and factors of identity. Course texts range from Jugendliteratur to newspaper articles, film, and poetry. Selections on culture and cultural learning in English will also be assigned. Students are expected to progress in all German language skills as well as their abilities to interact effectively and sensitively across cultural boundaries. Prerequisite: German 123 or 202.

**303 Introduction to German Literature** (3) S. The course offers an introduction to reading more substantial works of literature than those encountered in core-level courses. Works will be drawn from various periods and from various genres. Attention is also directed at the processes of reading and interpretation, and at what it means to mature as a Christian reader of literature. This course fulfills the core literature requirement. Prerequisite: German 123 or 202.

**361 Advanced Writing in Cultural Context** (3). F even years. Further development of advanced language skills through intensive work with written, aural and visual media dealing with contemporary issues in the German speaking world. Review of selected grammar topics. Prerequisite: German 301, 302, or 303 or permission of the instructor.

**362 Culture and Language through Performed Texts** (3). S even years. An introduction to different eras and cultural themes of German-speaking Europe through the reading, interpretation and presentation of a variety of texts. Works studied represent different performance genres, such as medieval mystery plays, sermons, epic poetry, traditional theater, music, radio plays, speeches, modern theater and poetry slams. Students learn to interpret these texts as cultural prod-

ucts with implicit goals, assumptions about audience and the role of performance texts, and worldviews. Connections to specific historical events, the visual arts and literary trends are explored as they relate to historical and contemporary performances of the various German texts. Students are expected to progress in their German language skills, including grammar, reading, speaking, and listening comprehension. This course fulfills the core rhetoric in culture requirement. Prerequisite: German 301, 302, or 303.

**371 German Visual Culture and Literature** (3). S odd years. An exploration of the culture of German-speaking Europe through its rich and intricately linked traditions of visual and literary culture. Students examine the interplay of texts and a broad variety of visual media including painting, sculpture, photography, theatrical and operatic production, film and television. Students will analyze materials for their rhetorical strategies and how they seek to move their audience with appeals to culturally and historically charged themes. While becoming familiar with salient ideas in German cultural history and the insights offered by a close analysis and appreciation of particular works of literature and art, students will gain valuable experience interpreting German cultural artifacts for their implicit worldviews, assumptions and goals. This course fulfills the core arts requirement. Prerequisite: German 301, 302 or 303.

**372 Outside Voices: German Culture from the Margins** (3). S even years. This course looks at German cultural history through the eyes of the outsider. Defining “outsider” as anyone marginalized because of race, ethnicity, religion, gender or native language, course materials focus on the nature of exclusion, resistance, and the way German cultural history and national identity have been shaped by voices traditionally outside of the mainstream culture. Perspectives addressed will include the experiences of women, Jews, Turks, Afro-Germans, Muslims and other minority groups. Prerequisite: German 301, 302 or 303.

**381 Special Topics** (1-3). This course offers the opportunity for focused study of a specific work, topic or author in a seminar setting. It includes intensive discussion in German of the topic or work at hand and reading of

secondary literature. This course may be repeated if taken for a different topic. In fall of even years this course is offered for 3 semester hours. 1-2 semester hour versions are offered every semester. Prerequisite: German 301, 302 or 303 or permission of the instructor.

**395 German Literature and the Reading Self** (3). F odd years. Works by major German authors are studied in relationship to major developments in German culture and society and to other cultural expressions, such as film and visual art. The works studied engage with a range of themes relevant to Christian identity and worldview, such as technology and culture, materialism, existentialism, feminist and environmental concerns, and the self's relationship to the world. Through study of these texts and reflection on our ways of reading them, the course explores the nature of Christian interpretation and the contours of a Christian practice of reading texts and cultures. This course fulfills the core integrative studies requirement. Prerequisite: German 301, 302, or 303.

**IDIS 356 Introduction to Elementary World-Languages Pedagogy** (3). F Theory and practice of teaching world languages in the elementary school. Study of second language acquisition, methodologies, curricula, and programs. Off-campus field experience and observations required. Should be taken in the junior or senior year, prior to student teaching. Required for elementary and K-12 certification in world languages including ESL. Prerequisite: completion of or concurrent registration in Education 302/303.

**IDIS 357 Introduction to Secondary World-Languages Pedagogy** (3). F An introduction to the major principles and practices of teaching world languages, offering a study of various methodologies and the major controversies associated with them. The course explores how a Christian approach to education affects second-language pedagogy and how this pedagogy interacts with the language learner's personal growth. It also introduces the prospective educator to the teaching of the basic skills, to issues in evaluation and assessment, and to the use of technologies in the language classroom. This course should be taken in the junior or senior year, prior to student teaching. Required for secondary or K-12 certification in world languages including the ESL secondary minor. Prerequisite: completion of or concurrent registration in Education 302/303.

**IDIS 359 Seminar in Secondary Foreign Language Pedagogy** (3). S. A seminar reinforcing the major principles and practices of foreign language pedagogy on the secondary level for students during their student teaching internship. The course will provide an opportunity for collaborative work on putting theoretical and pedagogical matters of immediate concern into a practical framework. This course is required concurrently with Education 346. This course does not count as part of the major or minor program. Prerequisites: Education 302/303 and successful completion of the department proficiency exam.

# Global Studies

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An interdisciplinary minor, the Global Studies minor is an integrative program intended to deepen students' understanding of cultural intelligence and ability to engage across cultural lines both at home and abroad. The Global Studies minor allows students to strengthen their linguistic abilities in one or more foreign languages, and learn to navigate the corresponding cultures that are accessed through those languages. The Global Studies minor encourages knowledge of societies and their cultures around the world, both through courses with a strong global content on campus as well as international experiences. The Global Studies minor is administered by an interdepartmental committee composed of the chairpersons of the foreign language departments: Young Kim (Classics Department), Corey Roberts (Germanic and Asian Languages Department), Jolene Vos-Camy (French Department), and Marcie Pyper (Spanish Department).

## GLOBAL STUDIES MINOR

(19-22 semester hours)

Three 300-level courses from Chinese, Dutch, German, Greek, French, Japanese, Korean, Latin, and/or Spanish (at least one course must be in a modern language)

Three from Art History 241, 243, 245, Classics 211, 221, 231, English 300, 372, Geography 110, 242, History 225, 233, 235, 238, 242, 245, 246, 261, 262, 264, 267, 271, 274, 331, 338, 346, 362,

364, 372, 376, Music 107, Philosophy 225, 226, Political Science 275, 276, 277, 279, Psychology 322, Religion 352, 353, 354, 355, 356, Sociology 153, 253 (one course per department)

IDIS 355

An approved off-campus program

Departmental/advisor confirmed participation in an approved Cultural Intelligence Workshop and an approved Multicultural Affairs Symposium or an approved Multicultural learning event.

## Greek

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See the Classics Department for a description of courses and programs of concentration in Greek.

# History

Professors B. Berglund, J. Carpenter, \*D. Howard, W. Katerberg (chair), K. Maag,  
F. van Liere, K. van Liere, W. Van Vugt

Associate Professors K. Du Mez, Y. Kim, R. Schoone-Jongen

Assistant Professors W. TenHarmsel, E. Washington

Students majoring in history will design programs of study in consultation with their departmental advisor. Such programs will reflect the students' interests within the field of history and in related departments, their anticipated vocational goals, and the demands of the historical discipline. Students are asked to consult with departmental advisors early in their college careers concerning their choice of a foreign language and, if secondary teaching is their goal, concerning the various types of programs leading to certification.

## REQUIREMENTS FOR ALL MAJORS

History 151 or 152 with a minimum grade of C

One from a period before 1500 (151, 261, 262, 263, 362)

One from a period after 1500

Two 300-level courses in addition to the required History 394 and 395

Elective credit may be met by an interim W40 or W80 history course

## HISTORY MAJOR

(minimum of 31 semester hours)

History 151 or 152

One 200 or 300 level American course

One 200 or 300 level European course

One 200 or 300 level World course

History 294

History 394 or History 390H/391H

History 395

Electives (minimum of 11 semester hours)

## HISTORY MINOR

(minimum of 21 semester hours)

History 151 or 152

Two courses from one cluster and one course from a different cluster:

North America cluster: History 229, 251-258, or 353-358

World cluster: History 233-245, 271, 331-346, or 372

European cluster: History 261-267 or 362-364

Two electives

History 294 or 394

## SECONDARY EDUCATION

### HISTORY MAJOR

(31-35 semester hours)

History 151 and 152

History 229

One additional American course

One European course

One World course

History 294

History 359

Interdisciplinary 375

History 394 or History 390H/391H

History 395

Elective (3-4 semester hours)

### Cognates

(10 semester hours)

Political science 101

Geography 110

Economics 151

Students wanting certification to teach history at the middle and high school levels should select this major. The elective is waived for students completing both the secondary history and social studies majors.

## ELEMENTARY AND SECONDARY EDUCATION HISTORY MINOR

(22-25 semester hours)

History 151 or 152

History 229

History 255

One from History 251-258, 353-358

One from History 233-245, 271, 331, 338, 346

One from History 225, 261-267, 362-364

History 294 or 394

Interdisciplinary 375 (secondary only)

## SECONDARY EDUCATION

### SOCIAL STUDIES GROUP MAJOR

(40 semester hours)

Economics 221

Economics 222

Geography 110

Environmental Studies 210

History 151

History 152



History 229  
History 359  
Political Science 101  
Political Science 202  
Interdisciplinary 205  
Interdisciplinary 375

Students pursuing the secondary social studies major must also complete a history major or a minor in economics, geography, or political science. Courses are allowed to overlap between the social studies major and the disciplinary major or minor.

### **ELEMENTARY SOCIAL STUDIES GROUP MAJOR**

(39 semester hours)

Economics 221  
Economics 222  
Education 305  
Geography 243  
History 151  
History 152  
History 229  
Interdisciplinary 205  
Political Science 101  
Political Science 202  
Elective  
Advisor approved Geography elective

Students must take two specified courses from each of the following four disciplines: economics, geography, history, and political science. (Specific course choices are listed in the Teacher Education Program Guidebook.) In addition, students must complete a sequence of courses from one of these disciplines chosen in consultation with a social studies advisor. Students seeking special advice on elementary teacher education should consult R. Schoone-Jongen or D. Miller.

### **COURSES (HIST)**

#### **Elementary Courses**

**151 History of the West and the World I** (4). F, S. This course examines the history of early human societies. The course begins with Paleolithic and Neolithic cultures and their transformation into ancient urban civilizations. It continues with the development of the classical civilizations and the major world religions, and the interaction of impulses from these, down to the European transoceanic voyages around the year 1500 A.D. Secondary

themes include evolution of societies around the world, the contrast of urban and sedentary and nomadic strategies for societies, and the development of technology.

**151H Honors Cluster West and the World I** (4). F. This cluster of honors sections of Art History 101 and History 151 offers a broad but detailed survey of the history, art, and literature from the prehistoric period and dawn of civilizations, through the classical and medieval worlds, up to ca. 1500. Attention will be focused on the developments across the landmass of Eurasia, stretching from the Mediterranean to the Pacific, with a particular emphasis on the emergence and evolution of unique cultural traditions and the interactions that took place among the great societies of the pre-modern world. Along with lectures, classroom discussions and short papers responding to primary sources will structure weekly coursework. A larger multi-disciplinary research paper will ask students to integrate the two linked courses. Stressing the importance of primary source materials, the cluster will include a trip to Chicago to see historical artifacts firsthand – particularly the collections of the Oriental Institute and the Art Institute of Chicago. Additional trips include a Sunday worship service at a Holy Trinity Greek Orthodox church, as well as evening prayers and a lecture at Mesjid-Tawheed, a place of worship for Grand Rapids Muslims. The course fulfills the core credit requirement of History of the West and the World. Enrollment is limited to 20 students and is restricted to those who qualify for honors enrollment.

**152 History of the West and the World II** (4). F, S. The history of modern human societies since c. 1500 including coverage of the scientific revolution and the European Enlightenment tradition; key political, economic, social, and religious developments in the West, including the non-Western world's contribution and reaction to them; and events of global significance through the latter half of the twentieth century, such as the industrial revolution, the world wars, and decolonization.

**152H Honors West and the World II** (4). S. An intensive study of world history since c. 1500. The first part of the course offers an overview of the entire period, tracing the broad patterns of modern historical development in a global context. The second

half of the semester focuses on one theme or episode in this period, with each student conducting, writing, and presenting an independent research project on the topic. This course fulfills the core requirement of History of the West and the World. Enrollment is limited to 20 students and is restricted to those who qualify for honors enrollment.

### Intermediate Courses

All 200-level courses presuppose History 151 or 152 or permission of the instructor.

### World Regions

**233 Modern Middle East** (3). The subject matter of this course is the Ottoman Empire and the creation of the Arab countries including Egypt, as well as Turkey, Iran, and Israel in the 20th century. Themes include colonialism and nationalism, secularism and religion, and literature and pop culture. Through this survey of Middle Eastern history the course aims to open up the American mental and emotional atlas and uncover the many meanings of the course title. Not offered 2015–2016.

**235 India and Its World** (3). S. A cultural history of South Asia from the earliest times to the twentieth century. Primary emphasis will be placed on the civilization of Hindustan and the interplay of Hindu and Islamic religious and cultural forces there. Themes include the rise of the major Indian religions, the cultural synthesis of the Mughal Empire, the impact of British rule, and the rise of the modern nations of India, Pakistan, Afghanistan, and Bangladesh. Economic, social, political, religious, and intellectual themes receive consideration.

**238 Latin American History** (3). A study of continuity and change in Latin America from pre-Columbian times to the present. Topics covered include the blending of peoples and cultures in the conquest era, the long-term influence of colonial institutions, the paradox of economic development and continued poverty, the Cold War struggle between Left and Right, and the growth of Protestantism in a traditional Catholic society. Not offered 2015–2016.

**242 Africa and the World** (3). F. This course covers specific themes in African history from ancient civilization to the contemporary period. Special attention will be given to Africa's

relation to the Mediterranean world, Africa's contribution to the development of the Christian church, Islam in Africa, slavery and slave trades, the African diaspora, imperialism, colonialism, and the age of independence. This course seeks to place African within a number of global contexts asserting that far from being the "Dark Continent," Africa was a major crossroads of civilizations throughout history.

**245 East Asia to 1800** (3). S. The history of East Asian civilizations from early times until the early modern period. Emphasis is on China and Japan, but Korea is also included. Primary objectives are for students to grasp the essential patterns of Chinese, Japanese, and Korean social structures, political systems, cultural values, and religious and ethical norms as they developed from the late traditional period through to 1800, and also to appreciate the similarities and differences among these civilizations.

### North America

**229 U.S.A.** (4). F. This survey looks at American history according to several interlocking themes: colonial roots and cultural and political divergence; the costs and benefits of expansion; industrialization and immigration; American leadership in the twentieth century; and challenges in the current century. This course is not intended for those who plan to take period courses in American history.

**251 Early America** (3). F. Study the region that became the United States, from the first European settlements through the Napoleonic wars. We will treat colonial America as a cluster of distinct socio-cultural regions: plantation Virginia, Caribbean Carolina, Puritan New England, commercial mid-Atlantic, and the Scots-Irish backcountry. These regions converged to sustain a successful war against the British, but almost fell apart again during the first decades of independence. We will pay special attention to the unexpected dynamics of the Revolutionary War and to the Constitution as establishing an arena of combat rather than a set of settled answers.

**252 America from Republic to Empire** (3). S. An examination of United States history after independence as the nation expanded, industrialized, and came to dominate the Western hemisphere. Special attention is given to the nation's foundations, western expansion,

and slavery; the Civil War and Reconstruction; the Progressive response to industrialization; and the United States' overseas expansion and participation in World War I.

**253 Recent America (3).** An examination of United States history from the 1920s to the present, focusing on the ways in which recent history shapes contemporary American culture, politics, economics, and religion. Topics include the "Roaring Twenties" and the Great Depression, WWII, Cold War America and Vietnam, the Civil Rights Movement and the Rights Revolution, conservative politics and religion, a post-industrial economy, and the role of the state at home and abroad. Special attention is given to changing configurations of race, religion, ethnicity, and gender in American social relations, and to the intersections of cultural history with political and economic history. Not offered 2015–2016.

**255 African-American History (3).** A survey of African-American history from West African societies to contemporary times. Highlights include the creation of a slave society in British North America, African-American intellectual traditions, the African-American church, and social and political movements for freedom. Not offered 2015–2016.

**258 U.S. Military History (3).** This course studies the military as an American institution from the colonial period through the "War on Terror." Though primary focus will be on the major wars fought by the United States, the course will also examine the various social, economic, and political factors influencing the development of the American military. Not offered 2015–2016.

**259 American Economic & Business History (3).** A study of American economic history from colonial times to the present, emphasizing the foundations of the American economy, the dynamics behind American economic expansion, the history of American business, the social costs and benefits of industrialization and modernization, the impact of various economic policies, and the nature of the economic changes of the 21st century. Not offered 2015–2016.

### Europe

**225 England (3).** F. A survey of English history including the Anglo-Saxon background; the medieval intellectual, religious, and con-

stitutional developments; the Tudor and Stuart religious and political revolutions; the emergence of Great Britain as a world power; and the growth of social, economic, and political institutions in the modern period.

**261 Ancient Mediterranean (3).** S. A study of the political, social, cultural, and economic developments of the ancient Mediterranean world, chronologically from the late Bronze Age to the beginning of Late Antiquity. Special attention is given to the formation of the Greek polis, radical democracy in Athens, the effects of Alexander's conquests, the Roman Republic, the transition to the Roman empire, and the rise and spread of Christianity, in the comparative context of concurrent developments in North Africa and the Near and Middle East.

**262 Early Medieval Worlds, 300-1000 (3).** In the wake of the Roman Empire, three distinct political cultures emerged from the disintegration of the Roman Empire: the Byzantine Empire, the Islamic commonwealth, and Christian Western Europe. This course will study the emergence of these areas, their interactions, and the manner in which they incorporated their Hellenistic legacy. Special attention is given to rise of Islam, the Christianization of Western Europe, the role of monasticism in East and West, and the way that all three civilizations integrated its Roman-Hellenistic heritage into its institutions and culture. This course will receive core credit in the Global and Historical core category. Not offered 2015–2016.

**263 Medieval and Renaissance Europe, 1000-1500 (3).** A treatment of one of the most formative periods in the development of European culture and institutions, when strong monarchies emerged out of feudalism and a new religious vitality transformed Christian spirituality. These impulses are traced through the rise of schools and universities, the Crusades, and the role of the papacy as a unifying political force in Western Christendom, concluding with the late-medieval economic and demographic crisis and the break-up of the medieval worldview in Renaissance Italy. Not offered 2015–2016.

**264 Reformation and Revolution: Europe 1500-1800 (3).** F. A survey of early modern European political and social history with particular emphasis on the Protestant Reformation, its social and intellectual origins,

and its political and social contexts and consequences, and on selected “revolutionary” political and intellectual movements, such as the Thirty Years’ War, the English Revolution, the emergence of modern science, the Enlightenment, and the French Revolution.

267 **Modern Europe** (3). S. A survey of Europe from the Congress of Vienna (1815) to the present. Using 1945 as a pivotal year, the course examines the major social, economic, cultural, and political trends that dominated the continent and inspired the two world wars: nationalism, industrialization, militarization, secularization, protest movements, and imperialism. The balance of the course examines the changes and continuities that have characterized the post-war period: economic integration, the Cold War and its aftermath, immigration, de-colonization, the tension between European unity and national identities, as well as burden of Europe’s past.

### Global Histories

271 **War and Society** (3). This is not a military history course. Instead, the course addresses the social and cultural contexts of warfare. Case studies are drawn from different conflicts during the 20th century in different world regions, such as Austria-Hungarian World War I, Japan after World War II, post-colonial West Africa, and the recent wars of the United States. Not offered 2015–2016.

274 **Environmental History** (3). An introduction to environmental history, the course gives particular attention to the North America and in each unit makes global comparisons or examines transnational trends. Key topics include the methods of environmental history, pre-human natural history, the relationship between hunter-gathers and the environment, the development of agriculture, the impact of European colonization globally, the consequences of the industrial revolution and urbanization, the emergence of environmental movements, changing cultural patterns in conceptualizing nature and humanity’s place in it, and the relationship between religious traditions, particularly Christianity, and environmental issues. Not offered 2015–2016.

### Theory and Practice of History

293 **Public History** (3). Public history refers to historical work done outside of schools, colleges, and universities, especially work in institutions such as museums, archives, preservation offices, and cultural resource agencies. It also includes historians who do historical work in business, consulting, and the legal profession. This course surveys the major topics and helps students develop skills used in public history through readings, discussion, guest presentations, and projects. For example, students will learn about the history of public history, employment opportunities for public historians, and public historical issues, and they will reflect on their own career possibilities in this field. Not offered 2015–2016.

294 **Research Methods of History** (3). F. I. An introduction to historical sources, bibliography, and research techniques, giving particular attention to the different genres of history writing, critical historical thinking and the role of perspective and worldview, the mechanics of professional notation, critical use of print and electronic research data bases, organizing and writing research essays, and the vocation of the historian. Intended as preparation for 300-level courses.

### Advanced Courses

*Enrollment in all 300-level courses resupposes two courses in history or permission of the instructor.*

### World Regions

331 **Studies in Middle Eastern History** (3). A study of U.S.-Middle East relations since about 1900. Under the conceptual framework of culture and imperialism, the topic is not limited to just foreign policy but the full range of economic, social, and cultural exchanges between Americans and Middle Easterners, including military alliances, commercial ties, media coverage, Christian Zionism, immigration, scholarship, and the like. This course is eligible for concurrent registration with History 394. Not offered 2015–2016.

338 **Mexico and the Americas** (3). S. Mexico has two roots—Hispanic-Catholic and Amerindian. It is poised modernity and tradition which continues to influence thought and behavior at all levels of society. Mexicans are

tor between a fierce loyalty to their country and a profound cynicism about its institutions and leaders. Finally, Mexicans simultaneously admire and resent their neighbor to the north. This course examines Mexico from its pre-Columbian and Iberian origins through its recent embrace of neoliberal economics and democratic politics. It concludes with the experience of Mexican-Americans in the U.S.

**346 Modern China (3).** An in depth, comprehensive treatment of Chinese history from the Qing Dynasty, about 1650, to the present. In addition to the basics of political, social, and economic history, the course will stress intellectual and religious currents, including the role of Christianity. Not offered 2015–2016.

### North America

**353 Ideas, Beliefs, and Values in American History (3).** S. (**Studies in U.S. Religious and Intellectual History**). This course examines the role of ideas, beliefs, and values in U.S. history, focusing topically on dominant and dissenting systems of thought and conviction that have been particularly important in U.S. history. The course will analyze both elite and popular materials from across the full range of public expression—from state papers to protest publications, the arts, journalism, religion, literature, and the academy—to understand how these have both shaped and responded to the key historical forces of their times.

**356 American Social and Cultural History (3).** A study of the development of American society from colonial times to the present organized around the themes of power, consumption, material culture, and the social construction of space. Attention will be given to the ways in which new sources, methods, and theoretical frameworks open up new topics and questions in American history, including the changing meaning of the American landscape, the development of suburbia, the rise of consumerism and the mass media, popular religion and the creation of sacred space, and the hidden ways in which power is exercised. Class, gender, and race will be categories of inquiry and analysis. This course is eligible for concurrent registration with History 394. Not offered 2015–2016.

**358 Native American History (3).** F (**Studies in the North American West**) The course is national in scope, but focuses especially on the American West, with comparisons to indigenous peoples in Mexico and Canada. Specifically, it looks at regional Native American chiefdoms and states in the centuries before European contact; the impact of horses on the Plains; trade with Europeans and Americans; Christian missions in the seventeenth and eighteenth centuries; the “Indian Wars” in the American West, 1840s–1890s; efforts to assimilate Native Americans in the nineteenth and early twentieth centuries; and campaigns by Native Americans to promote their civil rights and tribal sovereignty in the twentieth century.

### Europe

**362 Studies in Ancient and Medieval Europe (3).** F Offers an in-depth analysis of a particular topic or period within ancient and/or medieval Europe. Calling upon the rich variety of sources in ancient and/or medieval European culture and society, it practices historical analysis on interdisciplinary materials. Possible topics include the Greek polis, the Roman Empire of Augustus, Late Antiquity, Jews and Christians in the Middle Ages, Sex and Society in the Middle Ages, the Bible in the Middle Ages, and the Crusades.

**364 Studies in Early Modern and Modern Europe (3).** This course focuses on a particular period or movement in European history within either the early modern period (c. 1500–1789) or the modern period (since 1789). The specific content will vary from year to year. Past topics have included the Italian Renaissance, international Calvinism, imperial Spain, nationalism and communism in Eastern Europe, and the history of Christianity in 20th-century Europe. Not offered 2015–2016.

### Global Histories

**372 Studies of Modern Empires (3).** F The course examines the changing nature of empires and imperialism between the 15th and 20th centuries. It considers the influence of factors such as environment, religion, demography, race, technology, economic institutions, politics, and war on the creation of empires, the conduct of those who led them and were affected by them, and on their ul-

timate demise. While the particular empires examined will vary from one semester to the next, the broad underlying theme will be the evolution of empires and imperialism, from the land-based and overseas “gunpowder” empires of the early modern era to the “high imperialism” of the 19th century to the Cold War and globalization in the 20th century. This course is eligible for concurrent registration with History 394.

**376 Studies in the History of Women and Gender (3).** An introduction to topics in the history of women and to the use of gender as a category of historical analysis. This course examines experiences unique to women, as well as the social history of male-female interactions (in such institutions as the family, the church, and the political sphere) and the changing perceptions of masculinity and femininity in various historical contexts. This course serves as an elective in both History and Gender Studies. Not offered 2015–2016.

### Theory and Practice of History

**359 Seminar in the Teaching of Secondary Social Studies (3).** S. This course is designed to assist student teachers in developing appropriate goals and effective methods of teaching history and social studies at the middle and high school level. The seminar also provides a forum for the discussion of problems that develop during student teaching. Prerequisites: IDIS 375, concurrent enrollment in Education 346, and an approved history or social studies major.

**IDIS 375 Methods and Pedagogies for Secondary Social Studies (3).** I. A course in perspectives on, principles of, and practices in the teaching of history, government, geography, and economics at the secondary level. Included are teaching strategies, curriculum studies, readings regarding new developments in social studies education, and an examination of these topics as they relate to a Christian view of human nature. Prerequisites: Education 302-303 or permission of the instructor.

**390 Independent Study.** F, I, and S.

**390H Honors Tutorial in History (3).**

**391H Honors Senior Thesis (3).** A two-semester sequence designed to lead students to the writing of a more substantial seminar paper than is possible in History 394. This 390H–391H sequence replaces the required 394–300 level concurrent course combination. Thus History majors choosing this honors option must take one more 300 level history course to fulfill the 300-level courses requirement, in addition to the required 395 Seminar. Students spend fall term in History 390H conducting a thorough investigation of the secondary literature on and around a topic that they choose in close consultation with their advisor. They proceed in spring term to write a senior thesis upon that topic. Required for students in the department’s honors track and highly recommended for those planning to pursue graduate studies in history.

**393 History Internship (3).** S. A specialized class in which students enrich their historical education through experiential learning at a historical institution or sites in other appropriate fields of work, as approved by the History Department. Beyond the work of the internship itself, the course includes reading and written work and class meetings. Prior to beginning the internship, students must secure a semester-long internship, normally through the CalvinLink website, and submit a detailed description of their planned activities and educational objectives for the internship. The internship should involve at least 10 hours of work weekly for the duration of the 14-week semester. Those doing internships in a museum or archive normally will have completed History 293, Public History. In order to pass the internship, students must fulfill their original educational objectives, receive a favorable review from their internship site supervisor, attend the internship seminar faithfully, and submit all required assignments.

**394 Research Seminar (2).** F, S. An intensive study of a specific question or topic to the end of producing an article-length (20-30 pages) paper based on original sources and addressing a well-defined historiographical problem in the field. Not open to first- or second-year students. Must be taken with one of the 300-level concurrent courses above. See department for details.

**395 Historiographical Perspectives (3).** F, S. The capstone in the history major, this course examines the history of historical writing and the historian's vocation, primarily in the Western tradition. Emphasis is on reading and discussion of significant texts and issues in Western historical writing in past and pres-

ent times. We will consider such questions as: What is history? How should it be studied, taught, and written? What purposes does it serve? Students will evaluate a variety of Christian and non-Christian perspectives on these questions and be challenged to articulate their own answers.

# Interdisciplinary

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This section includes not only courses that are interdisciplinary (IDIS), but others also that do not fit logically into any single department or which are in disciplines not otherwise offered at Calvin.

## COURSES

**102 Oral Rhetoric for Engineers** (2). F, S and I. A study of the principles of oral rhetoric, with emphasis on developing student competency in preparing and delivering effective speeches. The emphasis is on basic speech design for engineers communicating their creation and refinement of ideas to peers, managers, subordinates, venture capitalists, and to the public at large.

**103 Oral Rhetoric for Engineers** (3). I. A study of the principles of oral rhetoric, with emphasis on developing student competency in preparing and delivering effective speeches. The emphasis is on basic speech design for engineers communicating their creation and refinement of ideas to peers, managers, subordinates, venture capitalists, and to the public at large. This course will be offered at an accelerated pace during the interim term. Pre-requisite: Enrollment in the engineering program.

**106 Introduction to Health Professions** (1). S. Students considering a health-related pre-professional program and a career in health care will be introduced to various health professions, as well as the required preparation for these careers, to help them identify career path(s) they may want to pursue. Students will consider Christian perspectives on health professions, evaluate ethical dilemmas, and engage in discussions about current issues in the health-care field. Students will also receive certifications that will prepare them for shadowing and volunteer experiences. This course is not intended for students who have decided on a nursing major.

**110 Foundations of Information Technology** (1). F, S. A first-year introduction to the foundations of information technology. Topics discussed include computer hardware and software systems, quantitative analysis with spreadsheets, networking and web publishing, the cultural impact of this technology and the ethical responsibilities of its users.

**149 First Year Seminar** (1). F. The first year

Seminar course introduces students to the mission and community of Calvin College and helps them transition to being college students, especially with regard to developing their abilities to think, discuss, and write. Students will also learn more about the values and attributes that sustain this community of learners.

**150 \*\*Developing a Christian Mind** (3). F, I and S. Taken during the first-year interim, this course introduces students to the central intellectual project of Calvin College, the development of a Christian worldview and a broad, faith-based engagement with the ambient culture. A set of common readings sketches out basic biblical themes and helps students begin to formulate a Christian frame of reference as they pursue their academic vocation. In addition to these common readings and themes, each section of the course defines a particular academic issue to explore from the perspective of Christian faith and praxis.

*\*\* A few sections of this course are offered during the spring semester. In addition, individual and multiple sections of the course have specific subtitles indicating the special focus of each.*

**160 Energy: Resources, Use, and Stewardship** (4). An introduction to the nature of energy and energy transformations with an emphasis on the different forms of energy and the use and availability of different energy resources, this course includes a study of the environmental implications of the use of a variety of energy resources such as fossil fuels, renewable resources, and nuclear energy resources. This course is taught from a biblical worldview and includes a discussion of the relationship between God, humans, the creation, the nature of science, and the validity and limitations of scientific knowledge. From these discussions a biblical view of stewardship and its implications for our use of energy resources is developed. Laboratory.

**180 Great Ideas, Great Texts** (1). F, S. A two-semester course required for all residents of the Honors Living-Learning Community on the third floor of Van Reken Hall. The course



involves weekly meetings to discuss assigned readings, hear guest lecturers, or watch films on a “great idea” in the fall and explore a “great text” in the spring. A different theme and book will be chosen each year for their interdisciplinary character, potential for exploring issues of diversity, and significance for a Christian liberal arts education. In their discussions, writing, and presentations the students will demonstrate their commitment to making their residence a community of learning and help to build a strong identity for the floor.

**190 Contextual Diversity Studies** (1). F, S. The Mosaic Floor is a living-learning community made up predominantly of first year and sophomore students. Students explore cultural diversity and racism. Due to the intentional nature of the community, students must apply to live on the floor.

**192 Across Cultures** (1). F, S. This course is made up of American and Canadian students who partner with an international student for cross-cultural engagement. Each week the partners meet to discuss topics such as their hometowns, families, eating habits, friendship patterns, dating and marriage customs, and barriers to crossing cultures— as well as doing an activity together. Students do a short reading, send in weekly journals, participate in a large group gathering and some campus events, but do not attend a regular class. The course lasts for ten weeks and satisfies the cross-cultural engagement core requirement. Students are placed in IDIS 192 by the instructor after the semester begins.

**193 Conversation Partners** (1). F, S. Each American or Canadian student partners with someone, usually a Calvin seminarian or spouse, for whom English is a foreign language. While the ESL partner has opportunity to practice spoken English and learn about the American culture, the American/Canadian student has opportunity to learn about the life and culture of their international partner. Class meets two times at the beginning of the semester. Partners meet for conversation throughout the semester. This course meets the cross-cultural engagement core requirement.

**194 American Ways** (1). F, S. This course is designed to help new international students better understand their own cultural values, how they differ from those of the Americans they encoun-

ter at Calvin, and how to navigate the differences. Each student partners with an American or Canadian student for a weekly conversation and activity. Examples of topics explored in class and with their partner are individualism, communication styles, power distance, friendship, families, different customs, and cultural adjustment. Students also do a short reading and send in weekly journal reports. The class meets for ten weeks and satisfies the cross-cultural engagement requirement.

**196 Transcultural Caring for the Health Professions** (3). The major focus of the course will be to increase student understanding and knowledge in the area of transcultural care (culture care), an area of study that is essential in the diverse and global world in the 21st century. Students will examine culture care from a Christian perspective, implementing a variety of theoretical perspectives on culturally congruent care. Students will have the opportunity to directly be involved with several ethnic groups as they examine the lifeways and cultural norms and values of groups in relationship to their health care needs. This course provides valuable information to students who are interested in entering the health care professions.

**198 Classical and Medieval Palaeography** (1). This course offers a practical introduction to reading Late Antique, Medieval, and Humanist Latin and vernacular script, from c. 200 AD until c. 1500 AD. We will master reading these scripts, while learning about their historical development and the production of written texts before the invention of the printing press. The script types studied in this course will range from square capital, cursive, uncial and half-uncial, Carolingian minuscule, Anglo-Saxon script, and the various forms of Gothic and Humanist script, while the texts we read will include Classical and Patristic texts, vernacular texts, and especially the Latin Bible.

**206 Introduction to Medieval Studies** (3). I, offered biennially. A classroom introduction to the skills that are specific to the interdisciplinary method of studying the Middle Ages, structured around a theme such as, “The Bible in the Middle Ages”, or “The cult of the Virgin Mary”. This course is mandatory for those students who have selected a minor in medieval studies, but it is open to anyone with an interest in the Middle Ages.

**205 Societal Structures and Education as a Social Enterprise** (3). F, S. An examination of the interaction between education and the other systems and institutions (e.g., political, economic, and cultural) that shape society. This course will examine how education is shaped by and is reshaping these systems and institutions. Particular attention will be given to the impact of race, class, and gender on schooling and society. Community-based research projects will challenge students to examine these issues in real-life contexts as well as introducing them to social science research methodology. Christian norms, such as social justice, will shape this critical analysis of the interaction between education and society. This class is appropriate for all students who are interested in education and society and meets a core requirement in the societal structures category.

**211 Cancer: A Multidisciplinary Examination of a Complex Disease** (3). I. Current reports indicate that cancer affects one out of every three Americans. As such, accurate diagnosis and effective treatment of cancer patients has become a priority for scientists, public health officials, and health care providers. However, cancer is complex, as is our current medical system. Providing high-quality, effective, affordable, and equitable care for cancer patients will require collaboration among those with varied expertise. In this course, students use a multidisciplinary approach to study cancer drawing on insights from cell biology, genetics, public health, sociology, economics, ethics and others. Discussions with health care professionals and scientists, and visits to health care facilities and research centers highlight the value of collaborative bench to bedside treatment strategies. Meetings with cancer patients and survivors provide insights into current successes and challenges in patient care. A final project challenges students to develop a multidisciplinary strategy for improving cancer care. This graded course is intended for Honors students from all disciplines. Individuals completing the course receive honors credit. Pre-course reading and attendance at one meeting in December are required. Not offered in 2015–2016.

**212 Global Health** (3). F This study of global health includes biological, social and environmental contributors to health and disease in

populations around the world. It covers health problems, issues and concerns as well as international health priorities and health payment systems in various countries. Students develop their own Christian response to global health issues. Prerequisite: sophomore status.

**234 The Contemporary American Religious Situation** (3). A description and analysis of current American religious developments in historical, sociological, and theological perspective. Institutional and non-institutional developments, within and outside the Judeo-Christian tradition, will be examined.

**240 Introduction to Archaeology** (3). See archaeology for course description.

**290 Cross-Cultural Engagement Independent Study** (0 or 1).

**301 Introduction to Bilingual and ESL Education** (3). F This course focuses on both Bilingual and ESL education. Students learn to recognize linguistic, cognitive, affective, and social factors that influence the acquisition of a second language. Course topics include teaching in content areas, classroom methods, curriculum design, and assessment. For students in the education program, concurrent registration in Education 302/303 is required. Field experience required for non-education students. One evening field observation required.

**310 History of Physical Science** (3). Alternate years. An examination of natural philosophy in the 17th century and of major developments since then in the physical sciences (predominantly physics and chemistry). Particular attention is given to the philosophical and religious background of scientific ideas and the institutional context in which science develops. A central theme of this capstone course will be the investigation of the interaction of science and religion with a view toward articulating a critical reformed Christian perspective on this historical development. Some primary texts will be considered. Prerequisites: developing a Christian mind, history of the west and the world, philosophical foundations, biblical/theological foundations I, junior/senior standing, and a declared major in the natural sciences (or approval of the instructor).

**340 Field Work in Archaeology**. See archaeology for course description.

**355 Integrated Global Studies (1).** Students will synthesize relevant course work and reflect constructively on building cultural intelligence and engaging across cultural lines. Key themes include cultural identity formation, key elements of cultural intelligence, and applying knowledge gained in relevant courses to the practice of crossing cultures. This course should be taken concurrent with or after the student's approved international learning experiences.

**356 Introduction to Elementary World-Languages Pedagogy (3).** F Theory and practice of teaching world languages in the elementary school. Study of second language acquisition, methodologies, curricula, and programs. Off-campus field experience and observations required. Should be taken in the junior or senior year, prior to student teaching. Required for Elementary and K-12 certification in world languages including ESL. Prerequisite: completion of or concurrent registration in Education 302/303.

**357 Introduction to Secondary World-Languages Pedagogy (3).** F An introduction to the major principles and practices of teaching world languages, offering a study of various methodologies and the major controversies associated with them. The course explores how a Christian approach to education affects second-language pedagogy and how this pedagogy interacts with the language learner's personal growth. It also introduces the prospective educator to the teaching of the basic skills, to issues in evaluation and assessment, and to the use of technologies in the language classroom. This course should be taken in the junior or senior year, prior to student teaching. Required for secondary or K-12 certification in world languages including the ESL secondary minor. Prerequisite: completion of or concurrent registration in Education 302/303. NOTE: For the Elementary K-12 endorsement, IDIS 357 requires a secondary field placement in addition to the regular course work.

**359 Seminar in Secondary World-Languages Pedagogy (3).** S. A seminar reinforcing the major principles and practices of world-languages pedagogy on the secondary level for students during their student teaching internship (Education 346). This course provides opportunities for collaborative work on putting theoretical and peda-

gogical matters of immediate concern into a practical framework. Prerequisites: Education 302/303 and successful completion of departmental proficiency exams.

**375 Methods and Pedagogies for Secondary Social Studies (3).** I. A course in perspectives on, principles of, and practices in teaching of history, government, geography, and economics at the secondary level. Included are teaching strategies, curriculum studies, readings regarding new developments in social studies education, and an examination of these topics as they relate to a Christian view of human nature. Prerequisites: Education 302-303 or permission of the instructor.

**385 Comenius Scholars Internship (3).** F, S. This internship course links liberal arts students to nonprofit apprenticeships in the community. Each internship involves a minimum of ten hours of work per week in a professional setting with an approved employer-supervisor. The academic seminar accompanying the internships involves reading, seminars/works, reflective journals, and a major paper/project/presentation. A student may participate for up to two semesters. Prerequisites: sophomore standing and permission of the internship coordinator.

**391 Seminar in African and African Diaspora Studies (3).** This course seeks to integrate key conceptual and theoretical frameworks to provide upper level students a good sense of how multiple disciplines such as history, philosophy, theology, anthropology, and literature engage African Studies and African Diaspora Studies. In this course, common readings will expand from the theoretical and conceptual to representative works on various themes in African and African Diaspora Studies. The primary focus of the course will be the creation of African-American, Afro-Caribbean, Afro-Latino identities and the negotiating processes involved. In our discussions of scholarly work, we will offer criticism and ask pertinent questions from a Reformed Christian worldview. As a senior seminar, the course utilizes a seminar approach where the class discussion and structure derives from interactions with the texts, theories, and ideologies. The course carries an honors option (to be arranged with the professor). Prerequisites: Three courses from the African or African Diaspora minor or by approval of the professor.

**393 Project Neighborhood Service-Learning Seminar** (1). F, S. This seminar integrates content related to urban community assessment, organization, and development in connection with service learning in the local community, using a cycle of action and reflection, in a group composed of Project Neighborhood participants.

**394 Gender Studies Capstone** (3). S. An integrative course that refers to previous work in the minor, focusing particularly on current research, theory, and controversies in the field. Special attention will be paid to nurturing mature Christian thinking on gender issues.

**396 Preparation for Graduate Programs in the Physical and Mental Health Professions** (0). F. This course will explore the application and interview process required for pre-doctoral students. The course is designed specifically to meet the needs of pre-health students with a specific interest in medicine, dentistry and other physical and mental health related professions (e.g. PA, PT, Psych PhD, etc.). Topics covered include an overview of the application process, writing the personal statement, professionalism, current issues in the medical sciences, financial planning for graduate school, and the traditional and multiple mini interview process. Prerequisite: Junior Status.

## International Development Studies

*Professor R. Hoksbergen*

*Associate Professor T. Kuperus*

The international development studies (IDS) major consists of eleven courses, eight required and three elective. A semester program in a developing country is also required for the major. Depending on the program, some courses from off-campus programs may apply as either required or elective courses. The IDS minor consists of six courses, three required and three elective, which together comprise a coherent, planned, interdisciplinary program in development studies. An IDS advisor must approve the plan for the minor. An interim or semester experience in a developing country is also normally expected. One approved interim course may apply to either major or minor programs. The program director is R. Hoksbergen (Economics). Advisors for the IDS program are J. Bascom (Geography), R. Hoksbergen, J. Kuilema (Social Work), T. Kuperus (IDS), and T. Vanden Berg (Sociology).

### INTERNATIONAL DEVELOPMENT STUDIES MAJOR

(33 semester hours)

IDS 201 or SPHO 205

IDS 351

IDS 355 or STHO 212

IDS 395

Political Science 322 or 309

Sociology 253

One from Environmental Studies 210 or Biology 364

Economics 236, 237 or 337 (Note: These courses have prerequisites which count as cognates\* for the major)

Semester experience in a developing country

Three electives from:

Biology 364, Economics 236, 237, 337, 338, Environmental Studies 210, 302, French 362, 363, Geography 230, 240, 242, 261, History 233, 235, 238, 242, 246, 273, 331, 338, 346, IDIS 212, IDS 359 (counts for 2 electives), Philosophy 226, Political Science 207, 214, 228, 276, 277, 279, 304, 307, 309, 319, 322, 328, Religion 252, 255, 353, 354, 355, Social Work 260, Sociology 153, 252, 303, 308, Spanish 309, 361, 362, 363, SPHO 342/315, STHO 210, STHO 211, approved courses from off-campus semesters, one course from Economics 343, Political Science 251, Social Work 320 or Sociology 320.

### **Cognates\***

(3-6 semester hours)

Economics 221/222 or 151

### **INTERNATIONAL DEVELOPMENT STUDIES MINOR**

(18 semester hours)

IDS 201 or SPHO 205

Sociology 253

One from IDS 351, 355 or STHO 212

Interim or semester in a developing country (or its equivalent)

Three advisor approved electives from the list of elective courses for the major, and also including IDS 351, 355, 395 and STHO 212

### **COURSES (IDS)**

*For non-IDS courses, please refer to course descriptions in their respective departments.*

**201 Introduction to International Development** (3). F, S. An introduction to the history of international development, to the realities of contemporary life in the world's low income countries, and to competing theoretical perspectives on development and change. The course addresses cultural, social, political, religious, economic, and environmental elements of people's lives in the developing world. It also surveys and critiques such dominant perspectives on development as modernization, dependency, globalization, and sustainable development.

**351 Theories of International Development** (3). S. An in depth study of some of the major contemporary theories about the causes and explanations of low levels of development as well as corresponding recommendations for promoting development at a national/international level. The main focus is on the primary causal factors of national development emphasized by different contemporary theories. Such factors include economic institutions and policies, political institutions and governance, cultural and religious orientations and practices, human rights, geography, natural resources, and the natural environment, technology, social capital and civil society, and globalization/imperialism. Prerequisite: IDS 201, SPHO 205 or permission of instructor.

**355 Community Development** (3). S. A study of the theories, problems and methods associated with international development work at the community level. Topics include participatory methods, community mapping, survey and assessment methods, project planning and evaluation, asset based community development, appreciative inquiry, donor-client relationships, organizational partnerships, gender mainstreaming, and adult education methods. Special attention is given to the way Christian development organizations carry out these methods. Most of the course is directed toward international community development experiences, but some case studies and illustrations are also taken from a North American context. Prerequisite: IDS 201, SPHO 205 or permission of instructor.

**359 Internship in Development** (12). F, S. Internships will typically take place in collaboration with the World Renew, and will generally involve World Renew's placement of the student with one of its partner organizations, either in a developing nation or in North America. Students will work for four to five months with this partner in areas of development work including community development, micro-enterprise and business development, literacy and adult education, organizational capacity building, data gathering, basic health, disaster preparedness and response, refugee assistance and resettlement, local church-based development, and peace and reconciliation work. Placement will occur through an application and interview process. See one of the IDS advisors for more information. Prerequisites: IDS 201 or SPHO 205, IDS 355 or STHO 212, Sociology 253, a semester educational experience in a developing nation or its equivalent, appropriate language capabilities, and junior/senior status.

**395 Senior Seminar in International Development Studies** (3). F, S. A study of the worldview foundations of contemporary development theories, with special attention to Christian perspectives on development and development work. Topics include modernization, dependency, post-development, feminist and capabilities approach perspectives on development, as well as Christian perspectives on development arising from the Roman Catholic, Mennonite and Reformed traditions. Prerequisites: senior status and two IDS courses.

# International Relations

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See the Political Science Department for a description of courses and programs of concentration in international relations.

## Japanese Language and Literature

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Associate Professor \*\*C. Roberts (chair)

Assistant Professor K. Schau

The Japanese language program is part of the Asian studies program, and is administered by the Germanic and Asian Languages Department. The Japanese language major includes eight Japanese language courses and four culture courses.

There are two possible minors available, the Japanese language minor and the Japanese study group minor.

The foreign language core requirement can be met by completing Japanese 202.

During both fall and spring semesters students may participate in a semester program of intensive Japanese language study at the Japan Center for Michigan Universities (JCMU) in Hikone, Japan. The center is run in cooperation with the University of Michigan, Michigan State University and other Michigan colleges and universities. In the summer only intensive Japanese language courses are offered in Japan. The advisors for this program are K. Schau and L. Herzberg of the Germanic and Asian Languages Department.

### JAPANESE LANGUAGE MAJOR

(42 semester hours)

History 245 or 246

Philosophy 225 or STCH 203

One from Religion 255, 355 or 356

Eight Japanese language courses

One culture elective from the following:

Art 241, History 245, 246, 346, 371,

Political Science 277, Religion 354,

355 or 356, JCMU courses

*A minimum of one elective course must be taken at the 300 level.*

### JAPANESE MINOR

(27 semester hours)

Japanese 101

Japanese 102

Japanese 201

Japanese 202

Japanese 301

Japanese 302

Japanese 311 or 312

### JAPANESE STUDY GROUP MINOR

(25 semester hours)

Japanese 101

Japanese 102

Japanese 201

Japanese 202

Three from Art History 241, History 245,

246, Political Science 277, Religion

255, 355, 356, any interim course on

Japan or culture course offered in the

semester program in Japan.

### COURSES (JAPN)

101 **Elementary Japanese I** (4). F An introduction to Japanese language and culture, stressing both spoken and written Japanese. After one semester students will be able to carry on simple conversations in Japanese, read dialogues written in Japanese, and understand some fundamentals of Japanese social values and ways of thinking.

**102 Elementary Japanese II** (4). S. A continuation of Japanese 101. Continued study of Japanese grammar with equal emphasis on improving conversational proficiency and on reading and writing Japanese. Many more “kanji” (Chinese characters) will be introduced for reading and writing and as a medium for gaining insight into Japanese culture. Prerequisite: Japanese 101 or permission of the instructor.

**201 Intermediate Japanese I** (4). F. The goal of this course is to further the student’s ability to speak, understand, read, and write the Japanese language. Extensive oral drills and reading exercises continue to be used. By the end of the term, the student will know 200 “kanji”. Numerous cultural notes and written dialogues portraying various social situations provide insight into Japanese culture and various ways of thinking. Prerequisite: Japanese 102 or permission of the instructor.

**202 Intermediate Japanese II** (4). S. This semester completes the study of basic Japanese grammar and syntax. By the end of the semester the student will have been introduced to most of the basic grammar patterns of Japanese and will have mastered a total of 270 “kanji”. Completion of this course satisfies the core foreign language requirement. Prerequisite: Japanese 201 or permission of the instructor.

**301 Advanced Japanese Language I** (4). F. This course is designed to develop advanced competence in both spoken and written Japa-

nese through exercises, drills, and conversation in class. The finer points of Japanese grammar will be analyzed systematically. Students will also continue their study of the written language by learning many new “kanji”. Various aspects of life in Japan today are discussed in order to prepare students culturally for travel, study, or work in Japan. Prerequisite: Japanese 202 or permission of the instructor.

**302 Advanced Japanese Language II** (4). S. A continuation of the systematic study of advanced grammar and composition. Students will learn many new “kanji” as they improve their skills in written Japanese. Conversation practice will also be emphasized. Prerequisite: Japanese 301 or permission of the instructor.

**311 Advanced Japanese Language and Culture I** (3). F. This course is designed to enhance understanding of Japanese culture, people, colloquial expressions and social behaviors through literature, articles, audio and video clips. Students will practice expressing their thoughts, opinions, and comments in Japanese, and learn to interact fluently in specific situations which are very common if one lives or works in Japan. Prerequisite: Japanese 302 or permission of the instructor.

**312 Advanced Japanese Language and Culture II** (3). S. This course builds on Japanese 311 through more literature, articles, audio and video clips on Japanese history, society, and culture. Prerequisite: Japanese 311 or permission of the instructor.

# Kinesiology

Professors D. Bakker, J. Bergsma, B. Bolt(chair), D. DeGraaf, Y. Lee, N. Meyer,  
J. Timmer Jr., K. Vande Streek, A. Warners

Associate Professors J. Kim, J. Ross, E. Van't Hof

Assistant Professors D. Gelderloos, B. Otte, J. Sparks, L. Siegmund

The Kinesiology Department explores the art and science in human physical activity and serves students interested in a variety of careers and courses of study. Potential careers include health and physical education teaching and sport coaching, pre-physical therapy and other allied health professions, health promotion and fitness leadership, sport management, and recreation therapy. The department also offers a dance minor and directs various physical activity programs including Dance Guild, intramurals, outdoor recreation, campus recreation, Healthy Habits, and intercollegiate athletics for men and women.

## **KINESIOLOGY MAJOR EXERCISE SCIENCE EMPHASIS**

(35-38 semester hours)

PER 107

Health Education 203

Health Education 254

Health 265 or 266

Kinesiology 201

Kinesiology 212

Kinesiology 213

Kinesiology 240

Kinesiology 241

Kinesiology 325

Kinesiology 328

Kinesiology 332

Kinesiology 346

Recreation 305

Cognates

(24 semester hours)

Biology 141

Biology 205

Biology 206

Chemistry 115

Physics 223

Statistics 143 or 145

Depending on program these may also be  
required (see your advisor)

Communication Arts and Sciences 101

Kinesiology 216 Medical Terminology

Psychology 151

Psychology 201

Sociology 151

## **KINESIOLOGY MAJOR PRE-PROFESSIONAL EMPHASIS**

(27 semester hours)

PER 107

Health Education 254

Kinesiology 201

Kinesiology 212

Kinesiology 213

Kinesiology 240

Kinesiology 241

Kinesiology 325

Kinesiology 328

Kinesiology 332

### **Cognates**

(up to 55 semester hours)

(number of courses from this group depends  
on pre-professional requirements)

Biology 141

Biology 205

Biology 206

One 200-300-level biology lab course

Chemistry 103

Chemistry 104

Physics 221

Physics 222

Statistics 143 or 145

Depending on program these may also be  
required (see your advisor)

Communication Arts and Sciences 101

Kinesiology 216 Medical Terminology

Psychology 151

Psychology 201

Sociology 151

All kinesiology students in exercise sci-  
ence and pre-professional tracks must be  
certified in CPR prior to graduation.

## **KINESIOLOGY MAJOR SPORT MANAGEMENT EMPHASIS**

(27-30 semester hours)

Kinesiology 201

Kinesiology 214

Kinesiology 218



Kinesiology 243  
Two 200-level kinesiology courses  
Kinesiology 315  
Kinesiology 320  
Kinesiology 332  
Kinesiology 346  
Recreation 305  
Cognate  
(4 semester hours)  
Biology 115 or 141

**REQUIRED BUSINESS MINOR**

(23 semester hours)  
Business 160  
Business 203  
Economics 221  
Economics 222  
Business 380  
One 300-level business elective

**KINESIOLOGY MAJOR—  
PHYSICAL EDUCATION K-12**

(39 semester hours)  
Three from PER 120-159  
Three from PER 160-189  
Dance 242  
Kinesiology 201  
Kinesiology 204  
Kinesiology 214  
Kinesiology 215  
Kinesiology 240  
Kinesiology 241  
Kinesiology 305  
Kinesiology 306  
Kinesiology 325  
Kinesiology 332  
Kinesiology 359  
Kinesiology 380

**Cognates**

(8 semester hours)  
Biology 115 or Biology 141  
Statistics 143 or Psychology 255

**KINESIOLOGY MINOR**

(18 semester hours)  
Kinesiology 201  
A minimum of five additional courses, at least two at the 300-level, approved by academic advisor and department chairperson

**KINESIOLOGY MINOR—  
SECONDARY EDUCATION**

(25 semester hours)  
Kinesiology 201

Kinesiology 204  
Kinesiology 214  
Kinesiology 215  
Kinesiology 240  
Kinesiology 241  
Kinesiology 306  
Kinesiology 325  
Kinesiology 380  
One from PER 120-159  
Two from PER 160-189

**Cognate**

(4 semester hours)  
Biology 115 or 141

**KINESIOLOGY MINOR—  
ELEMENTARY EDUCATION**

(24 semester hours)  
Two from PER 120-159  
Two from PER 160-189  
Dance 242  
Kinesiology 201  
Kinesiology 204  
Kinesiology 214  
Kinesiology 215  
Kinesiology 240  
Kinesiology 241  
Kinesiology 305  
Kinesiology 380

**Cognate**

(4 semester hours)  
Biology 115 or 141

**HEALTH EDUCATION MINOR**

(20 semester hours)  
Health Education 202  
Health Education 203  
Health Education 254 (Lab Fee)  
Health Education 265  
Health Education 266  
Health Education 308  
IDIS 212, a community health course, or approved interim

**Cognate**

(4 semester hours)  
Statistics 143

Please note that many courses in the health education minor are offered alternate years, so this minor takes careful planning. This minor is available to education and non-education students. The education programs require the approval of the Education Department and the approval of one of the

department advisors, B. Bolt, D. Bakker, A. Warners, and J. Bergsma who serve as the advisors for physical education and health education. Prior to the teaching internship, students must have the approval of the department. Criteria for approval are found in the Teacher Education Program Guidebook, available in the Education Department.

### **THERAPEUTIC RECREATION MAJOR (BSR)**

(37 semester hours)

Kinesiology 201  
Recreation 203  
Recreation 205  
Recreation 310  
Recreation 314  
Recreation 324  
Recreation 326  
Recreation 345  
Recreation 346  
Recreation 380

#### **Cognates**

(16 semester hours)

Statistics 143 or Psychology/Sociology 255  
Psychology 201  
Psychology 212  
Psychology 310  
Social Work 370

### **RECREATION LEADERSHIP MINOR**

(18 semester hours)

Kinesiology 201  
Recreation 305  
Recreation 310

Three approved courses, one of which may be a recreation interim

### **DANCE MINOR**

(18 semester hours)

PER 156  
Dance 202  
Kinesiology 214  
Dance 310  
Dance 330

Five courses from the following:

At least one semester hour in three of five styles (at level I or II): Modern, ballet, jazz, tap, or sacred dance (PER 151, 161, 152, 162, 153, 163, 154, 155, 165)

At least one semester hour at level II in one of the five styles listed above (PER 161, 162, 163, 165)

At least one elective dance technique course

Please note many courses in the dance minor are offered alternate years, so this minor takes careful planning. Dance minors are asked to consult with E. Van't Hof. Physical education core requirements in skill enhancement and leisure/lifetime are satisfied through the dance minor. Students would need an additional personal fitness/fitness core course to complete physical education core.

### **Core requirements**

The liberal arts core requirement in physical education is met by the following courses: one course from those numbered 101–112 or 222 (personal fitness); One from 120-159 (leisure and lifetime); and one course from 160-189 or 221 (sport, dance and society). Students may take two semester hours in addition to the core requirements, which may be applied to the minimum graduation requirements. Student athletes who participate in at least one semester of intercollegiate athletics are exempt from the one health and fitness category most appropriately aligned with the specific sport activity. Also, student athletes should only enroll in physical education classes that are not affiliated with their sport. Students with special needs should see Professor Y. Lee to arrange for an adaptive physical education course (Physical Education/Recreation 190).

### **COURSES**

#### **Physical Education and Recreation (PER)**

101-112 **Personal Fitness** (1). F, S. A course in this area is designed to provide students with the basic knowledge and activity requirements to maintain active lives. This course is to be used as a gateway course before students complete their two additional requirements, one from leisure and lifetime activities and one from sport, dance and society core categories. (Students take one course from the personal fitness series then one course each from the leisure and lifetime series and from the sport, dance and society series.) The emphasis in each course is on fitness development and maintenance. Students are expected to train 3 times per week—2 times in class and 1 time outside of class. All courses involve the participation in conditioning activities, lectures, discussions, papers, and tests. Elementary education students take Physical Education 222 for their personal fitness course. Conceptual topics related to wellness included in all per-

sonal fitness courses are these: (1) principles for the development of an active lifestyle, (2) issues in nutrition, and (3) body image.

- 101 **Jogging and Road Racing**
- 102 **Nordic Walking**
- 103 **Road Cycling (Fee)**
- 104 **Core Strength and Balance Training**
- 105 **Aerobic Dance**
- 106 **Cardio Cross Training**
- 107 **Strength and Conditioning**
- 108 **Aquatic Fitness**
- 110 **Water Aerobics**
- 112 **Special Topics in Personal Fitness**

PER 120-159 **Leisure and Lifetime Activities** (1). F, S. A course in this area is designed to provide students with the basic knowledge to acquire and develop selected motor skills for a lifetime of leisure. Each course emphasizes the following: 1) personal development in a specific activity, and 2) acquisition of basic skills needed for a lifetime of healthy leisure activity. Lectures, readings, and activity (golf I, bowling, sacred dance, etc.) are used to educate the student on the values of skill instruction, practice, and participation in a lifetime activity. Students are provided with a general introduction to current issues such as these: skill building, Christian stewardship, and stress management.

- 120 **Scuba**
- 124 **Swim I**
- 125 **Swim II**
- 126 **Cross Country Skiing**
- 127 **Downhill Skiing**
- 128 **Ice Skating**
- 129 **Karate**
- 130 **Women's Self Defense**
- 132 **Golf I (Fee)**
- 133 **Golf II (Fee)**
- 137 **Bowling (Fee)**
- 138 **Wilderness Pursuits (Fee)**
- 140 **Special Topics in Leisure and Lifetime Activities (Fee dependent on topic)**
- 141 **Rock Climbing I (Fee)**
- 142 **Rock Climbing II (Fee)**
- 143 **Canoeing (Fee)**
- 144 **Frisbee**
- 145 **Fly Fishing**
- 150 **Educational Dance**
- 151 **Tap Dance I**
- 152 **Jazz Dance I**
- 153 **Modern Dance I**
- 154 **Sacred Dance I**
- 155 **Ballet Dance I**

- 156 **Creative Dance**
- 157 **Rhythm in Dance**
- 158 **Social Dance**
- 159 **Square & Folk Dance**

160-189 **Sport, Dance and Society** (1). F, S. A course in this area is designed to help students develop a faith-informed perspective, understanding of and appreciation for the impact of highly-skilled human movement through play, sport, with a particular focus on the enhancement of selected motor skills. Lectures, readings, and group activity are used to educate the student on the values of skill instruction, practice, and participation in a lifetime activity.

- 161 **Tap Dance II**
- 162 **Jazz Dance II**
- 163 **Modern Dance II**
- 165 **Ballet Dance II**
- 167 **Period Styles of Dance**
- 168 **Visual Design in Dance**
- 170 **Special Topics in SDS**
- 171 **Racquetball**
- 172 **Water Polo**
- 173 **Basketball**
- 174 **Volleyball I**
- 175 **Volleyball II**
- 176 **Cooperative World Games**
- 177 **Slow Pitch Softball**
- 180 **Badminton I**
- 181 **Badminton II**
- 182 **Tennis I**
- 183 **Tennis II**
- 185 **Soccer**

### **Kinesiology (KIN)**

190 **Introduction to Kinesiology**. F, I, and S. This course is available to students with special needs who cannot participate in other physical education/recreation classes. This course may be repeated to fulfill the health and fitness core requirements. See Professor B. Bolt for information.

191-199 **Elective Courses**. F, I, and S. The courses listed in this series are offered to meet the special interests of students. Students may select a course from this group based on interest or academic program. These courses will count toward the total graduation requirement, but will not count as core courses.

- 191 **Lifeguard Training (2)**
- 193 **Sports Officiating (2)**
- 199 **Independent Activity (1)**

**201 Introduction to Kinesiology** (3). F, S. An exploration of human movement in work, leisure, play, sport, fitness and similar settings. This study of personal development in, about, and through physical activity builds on a Christian understanding of the human body and the place of physical activity and personal development in the Christian life and includes biological, social and philosophical factors that affect health and wholeness in populations around the world. A gateway course designed to develop wonder and possibilities from and for professions and content areas in Kinesiology and related fields.

**204 Curricular and Instructional Principles for Teaching Physical Education** (2). S. alternate years. An overview of curricular concepts, planning principles and management skills necessary for effective teaching and learning in physical education. This course is designed to give prospective teachers insights into the nature of physical education and effective instructional strategies. The course involves discussions, written assignments, research readings, observations, task teaching, and assessment applications. Prerequisite: Kinesiology 201.

**212 Anatomical Kinesiology** (3). F A study of human motion based on structural foundations. Particular attention is given to bone, joint, muscle, connective and nerve structures, and the movement patterns specific to these structures. An analysis of efficient anatomical movement patterns for loco-motor, manipulative, and sport skills are studied in the course. Prerequisite: Biology 205 (may be taken concurrently), or permission of the instructor.

**213 Biomechanics** (3). S. A study of human movement based on the body's anatomical structure and mechanical function. Includes a review of anatomical movement patterns with in-depth kinematic and kinetic analysis of loco-motor, manipulative, and sport skills. Students determine patterns of efficient movement for various sports skills based on physical and mechanical principles of human movement. Prerequisite: Kinesiology 212 or permission of the instructor.

**214 Applied Kinesiology** (3). F. The course will study pragmatic and field based material related to human anatomy, kinesiology and biomechanics. Primary focus will be applied

to the study of major muscle and joint groups as they are involved in the science of human movement. Students will be required to learn the basic neuro-anatomical structures and functions of the musculoskeletal system. Students will also learn the basic mechanical laws that govern movement and apply these principles to common movements in sport, exercise, dance, and other physical activities. Prerequisite: Sophomore status and Biology 115.

**215 Physical Education and Recreation for Persons with Disabilities** (2). S. alternate years. Philosophy and basic concepts relating to planning and conducting programs in educational and community settings for individuals with disabilities. Concepts and techniques in program planning, leadership, and adaptations of facilities, activities, equipment in physical education and recreation services for individuals with special needs are reviewed and discussed.

**216 Medical Terminology** (3). F This fulfills the prerequisite for pre-physical therapy, pre-occupational therapy, physician's assistant, and therapeutic recreation graduate programs. The course includes basic medical word structure, organization of the body, word parts (roots, suffixes, prefixes), medical specialties, and case reports. The course includes chapter quizzes, practice reading and writing medical records, a faith perspective paper, and a comprehensive final exam.

**218 Administration of Athletics** (3). F Alternate Years. This survey course will introduce students to the profession of sport management and its relationship to the broader fields of physical education and recreation. The course will include an overview of the major aspects of sport management including sport facility design, sports marketing and fundraising, leadership and personnel management in sport, and sport law. Prerequisite: Kinesiology 201.

**223 Movement and Health Education in the Elementary Classroom** (3). F, S. The course provides working knowledge of the fundamentals of health and physical education, emphasizing aspects that can be integrated into the elementary classroom. Particular attention is given to the rationale, curriculum, resource materials, and learning activities most important to elementary students. An

overarching theme within the course is to examine God's gifts of human movement and health and a Christian response to these gifts. The course is required for all elementary education students and will substitute for the physical education core requirement in the category of sport, dance and society. Prerequisite or corequisite: Education 102.

**240 Cardio-respiratory Fitness Assessment, Prescription, and Leadership** (2). F

This class and lab-based course will introduce students to the methods and skills necessary for cardio-respiratory fitness (CRF) appraisal and prescription for healthy adults, as well as the principles of group and one-on-one aerobic exercise leadership. Topics include 1) risk factor identification and stratification, 2) relative contraindications to exercise testing, 3) informed consent and health questionnaires, and 4) submaximal and maximal aerobic exercise testing skills including blood pressure and heart rate. The benefits and risks of exercise testing and training, and the accepted modalities for exercise leadership will be discussed and practiced in the laboratory and both a fitness and aquatic center setting. Prerequisites: personal fitness core.

**241 Muscular Fitness Assessment, Prescription, and Leadership** (2). S

This class and lab-based course will introduce students to the methods and skills necessary for muscular strength and flexibility (MSF) assessment and prescription for healthy adults, as well as the principles of strength training group leadership and individualized personal training. Topics include muscular strength, endurance, power, and flexibility assessment, 2) the benefits and risks associated with resistance training, 3) selection and prescription of appropriate resistance and flexibility training modalities based on fitness assessment, 4) common orthopedic considerations, and 5) ability to safely demonstrate and lead exercises. Students will learn to conduct a comprehensive workout to include evaluation, warm-up, training bout, cool-down, and flexibility modalities. Prerequisites: personal fitness core.

**243 Sport Psychology** (2). S, alternate years.

This introductory course examines the ways in which psychological factors influence one's sport performance. Research based topics include an examination of attentional styles and issues, causal attributions, motivational

factors, somatic and cognitive competitive anxiety, and issues related to mood states, self-talk, self-concept and self-efficacy. This course also examines an array of research based psychological principles and skills which an individual can employ to enhance her/his motor performance. Such topics include the use of imagery, motivational strategies, goal setting, thought-stopping techniques, cognitive restructuring, methods to manage somatic and cognitive anxiety, attentional control skills, and strategies to enhance one's self-concept and self-efficacy. Students are evaluated on in-class participation, a group or individual research project and presentation, homework assignments and written tests. Prerequisite: Kinesiology 201.

**255 Sports Medicine** (3). S, alternate years.

The course covers physiological principles as they apply to physical conditioning and rehabilitation from injuries. Specific types of conditioning programs and general first aid techniques are studied. Laboratory topics include taping techniques. Prerequisite: Biology 115, Kinesiology 212 or equivalent.

**305 Elementary Physical Activity and Development** (3). F

A study of basic knowledge, skills, and strategies involved in the various educational activities appropriate for elementary school physical education programs. This course focuses on methods and resources for the elementary school curricula. Course includes lectures, discussions, demonstrations, laboratory teachings, student presentations, and resource material compilations. Prerequisites: Kinesiology 204.

**306 High School Physical Activity and Skill Acquisition** (3). S, alternate years.

This course focuses on methods and resource materials appropriate for secondary school physical education programs. Coverage includes team sports, individual and dual sports, fitness building activities, recreational sports activities, and adaptive activities. The course includes lectures, discussions, demonstrations, laboratory teachings, student presentations, and compilation of resource materials. Prerequisites: Kinesiology 204.

**315 Sociology of Sport** (3). S, alternate years.

A study of the social and social-psychological dynamics of sports in modern society. Areas receiving special attention are

youth sports, interscholastic sports, and professional sports. Emphasis is put on describing and understanding sports participants, observers, and the relationship of sport as an institution to the rest of the social structure. Also offered as Sociology 315.

**320 Sports Marketing and Public Relations (3).** S, alternate years. This course explores the breadth of the sports marketing industry and its consumer and communication realities. Students study market selection and how to plan, create, and assess sports marketing communication programs that include advertising, marketing, public relations, and new media. Prerequisites: Kinesiology 218 or permission of instructor.

**325 Physiology of Physical Activity (4).** S. A study of physical efficiency and physiological principles involved in human exercise. Emphasis will be placed on the responses of the respiratory, cardiovascular, and muscular systems. The course includes the physiology of factors affecting performance such as the environment and the use of tobacco, alcohol, and drugs. The laboratory will help students apply principles and techniques used in assessment of physiological responses to exercise. Prerequisite: Biology 115, 141 or permission of the instructor.

**328 Advanced Practices in Exercise Science (3).** F. An in-depth survey of clinical exercise physiology, exercise patho-physiology, and biomechanics. Emphasis will be placed on resting and exercise electrocardiography, health and fitness appraisal and exercise prescription for specific populations (adults, pregnancy, the elderly) and disease modalities (cardiovascular, pulmonary, neuromuscular, orthopedic, cancer) and advanced biomechanical skills in sport skills and motion analysis. The course incorporates significant lab work, research and analysis. Prerequisite: junior standing, Kinesiology 213 and Kinesiology 325, or permission of instructor.

**332 Philosophy of Physical Education and Sport (3).** F. Core capstone course. This course provides students with a survey of philosophical inquiry about sport and physical education. Topics include the nature of play and sport, sport as meaningful experiences, ethics in sport and physical activity, and contemporary issues such as drugs, violence, and gender. Throughout the course,

students are confronted with issues from a Christian and Reformed perspective in order to develop their own Christian perspectives. Prerequisites: biblical foundations I or theological foundations I, developing a Christian mind, and philosophical foundations.

**346 Field Internship (3).** F, S, and SS. An internship or field experience at an approved agency, institution, or service as specified by a student's major and advisor in kinesiology. Where applicable, the seminar focuses on the problems and issues involved in relating theory to professional practice. Prerequisite: Recreation majors must first complete all courses in the recreation program. Other kinesiology majors must have junior or senior standing. All students must have a minimum cumulative grade point average of C (2.0) and the approval of the department advisor.

**359 Student Teaching Seminar (3).** F. The seminar deals with perspectives and methods of teaching physical education. This course should be taken concurrently with Education 346 and will provide a forum for discussion of problems and issues that develop during student teaching. Before taking this course, students must be admitted into directed teaching by the education and Kinesiology Departments. Students must complete the physical education major prior to student teaching.

**380 Individual Competencies (1).** F, S. This course assists students in the development of a portfolio documenting essential skills and experiences needed to prepare them for professional practice in the disciplines of health, physical education, recreation, and dance. Students will document their skill competence in a variety of fitness, movement/dance and sport activities, as well as document proficiency in teaching, administrative, and professional competencies.

**390 Independent Study.** F, I, and S.

**391 Honors Project and Presentation.** F, I, and S.

### Recreation (RECR)

**203 Leadership in Recreation Programs (3).** F. alternate years. This course is designed to conduct an in depth investigation of basic leadership skills related to the delivery of recreation programs and related human services within a Christian worldview. An overview of

the leadership theories, concepts, and strategies related to the delivery of human services will be provided. A leadership lab will be used to develop and practice team building skills, group facilitation, and leadership techniques, as well as problem solving skills that will be useful in leading recreation programs.

**205 Therapeutic Recreation and Diagnostic Groups** (3). S, alternate years. A general orientation to therapeutic recreation and its role in serving the needs of persons with varying abilities. The etiology, characteristics, and considerations for treatment of persons with a wide range of common diseases and disorders are reviewed and discussed. Practical application and adaptations for serving the recreation and leisure needs of persons with disabilities will be made.

**304 Management of Leisure Services** (3). A study of principles, policies, theories, and procedures involved in the organization and administration of leisure services in a variety of settings. Students will develop a professional portfolio and explore career opportunities in their discipline. Topics Include: staffing and human resources, organizational culture and structure, and legal aspects and employer relations. Prerequisite: Kinesiology 201 or Recreation 203.

**305 Program Planning and Development** (3). S. A study of the principles and techniques of recreation, sport, and health program development. The application of a program development model, which is used in the organization and planning of recreation programs, is emphasized. Students will design a program from the bottom up, including: needs assessment, mission and goals, staffing, risk management, promotion, and evaluation. This course is a requirement for Recreation, Sports Management, and Exercise Science majors and will be offered once each academic year. Prerequisite: Sophomore status.

**308 Recreation Program and Facility Management** (3). This course will review the principles and procedures related to the operation and care of private and public recreation resources, areas, and facilities. Topics will include: Establishment of legal authority for operations, developing policies and guidelines, interagency coordination and/or competition, safety and security, and systems

evaluation. Prerequisite: Recreation 305 or permission of the instructor.

**310 Theory and Philosophy of Leisure** (3). F Core capstone course. This seminar course reviews the theories and philosophies of work, play, and leisure and their influence on contemporary culture. Discussions on selected readings help develop an understanding of the political, sociological, psychological, economic, and theological aspects of work, play, and leisure in contemporary society. Emphasis is placed on the development of a Reformed Christian perspective and its implications for personal life and professional practice. Prerequisites: biblical foundations I or theological foundations I, developing a Christian mind, and philosophical foundations.

**312 Special Topics in Recreation and Leisure Studies** (3). This course will provide a format to investigate relevant topics that are not sufficiently covered in the core recreation curriculum. Given the broad range of topics within the recreation profession, a rotating curriculum enables students to study various issues in greater detail. Topics may include: 1) Alternative (i.e. volunteer, community-based) travel & tourism, 2) Wilderness & Adventure Education and 3) Social Entrepreneurship. Topics will rotate and the course will be offered every other year. This course is a requirement for Recreation majors. Prerequisite: Sophomore status.

**314 Programming Principles of Therapeutic Recreation** (3). F, alternate years. An introduction to the history, philosophy, and concepts of therapeutic recreation. An orientation to the role and function of therapeutic recreation personnel in the treatment of persons with psychological impairments, physical impairments, developmental impairments, pediatric illnesses, and the problems of aging are presented. Prerequisite: Kinesiology 201 or permission of the instructor.

**324 Therapeutic Recreation Clinical Practice** (3). F, alternate years. An introduction to the basic methods and techniques used in the delivery of therapeutic recreation services. Skills in interpersonal and helping relationships are reviewed and practiced in the context of their application to specific treatment approaches including leisure counseling, play therapy, physical confidence

classes, stress challenge, and physical fitness programs. Prerequisites: Kinesiology 201 or permission of the instructor.

**326 Intervention Techniques in Therapeutic Recreation (3).** S, alternate years. Therapeutic recreation (TR) programs contain a theoretically sound and effective set of treatment protocols. It is important for practitioners to be able to identify client needs and select appropriate interventions to meet those needs. This course will provide students with clinical skills related to diverse treatment modalities and facilitation techniques through intentional observations of the programs delivered by master clinicians and hands-on experience of diverse treatment interventions. Prerequisite: Kinesiology 201 or permission of the instructor.

**345 Field Seminar in Therapeutic Recreation (3).** S, alternate years. Therapeutic recreation students work with field and college supervisors to develop an understanding of the assessment, planning, implementation, and evaluation process in therapeutic recreation settings. Case studies from the agency and from selected publications provide the framework for these learning outcomes that are developed in a weekly seminar. Prerequisite: Kinesiology 201

**346 Field Internship in Recreation/Therapeutic Recreation (3 OR 12).** F, S, and SS. An internship or field experience at an approved agency, institution, or service as specified by a student's major and advisor in recreation. Where applicable, the seminar focuses on the problems and issues involved in relating theory to professional practice. Prerequisite: Therapeutic Recreation majors must first complete all courses in the recreation program. All students must have a minimum cumulative grade point average of C (2.0) and the approval of the department advisor.

**380 Individual Competencies (1).** F, S. This course assists students in the development of a portfolio documenting essential skills and experiences needed to prepare them for professional practice in the disciplines of health, physical education, recreation, and dance. Students will document their skill competence in a variety of fitness, movement/dance and sport activities, as well as document proficiency in teaching, administrative, and professional competencies.

**390 Independent Study.** F, I, and S.

**391 Honors Project and Presentation.** F, I, and S.

### Health Education (HE)

**115 Essentials of Anatomy and Physiology (4).** F, S. This is a study of the major theories of biology as applied to humans. The student is introduced to the concepts of cells, genetics, ecology, and evolution through the study of anatomy, physiology, and development of the human body and health. Students apply these concepts to contemporary issues in human biology, society, and the environment. The laboratory utilizes methods of biological investigation, with an emphasis on human anatomy and physiology. Laboratory. Cross-listed Biology 115.

**202 Foundations of Health Education (3).** F, alternate years. This course will provide students with an introduction to basic issues in the development of health education. In addition to the history and philosophy of health education, topics will include the following: Health promotion, professional competencies, ethics, faith perspectives, and professional organizations.

**203 First Aid and Emergency Care (2).** S, alternate years. This course will enable the student to acquire increased accident and safety awareness, as well as understand the liability aspects of administering first aid. The course will cover the cognitive and practical skills of standard first aid, artificial respiration, and CPR. Opportunity for American Red Cross Certification in adult, child, and infant CPR and first aid will be offered as part of the course.

**254 Nutrition (3).** F, S. This course will provide the student with a basic understanding of human nutrition. Special emphasis will be placed on the role of food and nutrients in sustaining optimal health. Specific topics of study will include nutrition as it relates to athletic performance, the onset of diseases, and obesity. Prerequisite: Biology 115, 206, or equivalent. This course is limited to students with kinesiology majors, nursing majors and students in the pre-professional programs for veterinary, physician assistant.



**265 Basic Health Concepts: Mental Health, Fitness, Sexuality, Aging, Addictive Behaviors, and Death** (3). F, alternate years. This course is designed to provide students with basic health content. Topics to be discussed include a Christian perspective on health and wellness, mental health and stress, physical fitness, sexuality and reproduction, addictive behaviors, and aging and death. Prerequisite: Biology 115 or equivalent.

**266 Basic Health Concepts: Diseases, Substance Abuse, Community, and Environment** (3). S, alternate years. This course is designed to prepare health education minors with a wide variety of health education content include the following: A reformed perspective on health, risk factors for lifestyle diseases, consumer health, environmental health, lifestyle and communicable diseases, substance abuse, and cancer. Prerequisite: Biology 115 or permission of the instructor. This course may be taken before Health 265.

**307 Community Health** (3). This course focuses on the health needs of individuals in a variety of community settings. Students will learn about current health and non-health conditions affecting U.S. communities. Open to all juniors and seniors interested in health-related professions.

**308 Administration and Methods** (3). S, alternate years. This course is designed to provide experiences that will enable the student to develop methodology, management, administrative, and instructional skills required to plan and implement a contemporary health education program in school settings. Prerequisite: Health 202 or permission of the instructor.

### Dance (DAN)

**202 Dance in Western History** (3). S, alternate years. A study of the historical development of western dance from early lineage-based societies in Europe to contemporary forms in European and North American cultures. Emphasis is placed upon the development of dance as a performing art. The course investigates parallel trends in the arts of music,

visual art, drama, and dance throughout western history. Satisfies college core in the arts.

**242 Dance in Physical Education** (2). F, alternate years. Required of all physical education/ teacher education majors and minors. This course explores the doing and creating of dance (process and product) and the planning and teaching of dance (lesson design and pedagogy) in the physical education curriculum K-12. Students gain a working knowledge of the fundamentals of dance within Physical Education. Students study, perform, create, plan and teach various dance forms (folk, square, social and creative dance) with special attention to appropriate resources and pedagogy. Learning occurs through lectures, discussions, studio activity, teaching opportunities and the collection of dance resources.

**310 Dance in World Culture** (3). F, alternate years. A study of the relationship of dance to issues of contemporary culture: the role and power of dance to define and reflect community, societal, and religious values and the role of dance within the arts of diverse cultures. An investigation of the dance traditions of many cultures through video, readings, dancing, lecture, discussion, and writing. The course is designed to broaden students' cross-cultural understanding through the art of dance. Satisfies college core in global and historical studies.

**330 Dance Composition and Performance** (3). S, alternate years. An intensive engagement with the art of choreography. Students explore the concepts of body, space, rhythm, choreographic forms, meaning, and group design. Students create movement studies through improvisation. They develop analysis and evaluation skills through observation, reflection, discussion, and written critiques that prepare them to design and evaluate dance. Students choreograph a final dance and perform it for an audience. They present the process and the application to their lives as Christians through writing and oral presentation. Prerequisite: Physical Education 156 or permission of the instructor. Satisfies college core in the arts.

# Korean

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See the Asian Studies Department for a description of courses and programs.

# Latin

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See the Classics Department for a description of courses and programs of concentration in Latin.

# Latin American Studies

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The interdisciplinary minor in Latin American studies is designed to acquaint students with the histories, cultures, languages and contemporary realities of Latin America. The minor forms an appropriate background for people who intend to live and work in Latin America as well as those who intend to live and work with Latino people in North America.

The minor consists of six courses (minimum of 18 semester hours), three required and three electives, distributed as described below. No more than three courses may come from a single discipline, and at least two courses must be at the 300 level. Participation in an off-campus semester program or interim course in Latin America is required. Competence in an appropriate foreign language (Spanish, Portuguese, French) is also required and will be demonstrated by the successful completion of a literature or culture class at the 300 level in a foreign language. To be admitted to the minor, students must meet with an advisor to select courses that together comprise a coherent program. The advisor for the program is D. Ten Huisen (Spanish).

## LATIN AMERICAN STUDIES MINOR

(18 semester hours)

Participation in one off campus interim or semester program in Latin America

One contextual studies course from:

History 238, 338, or Study in Honduras 210

One social science course from:

Economics 237 (when offered as Latin American Economics), Geography 240, Political Science 276, Study in Honduras 205, 211, or

One literature or culture course taught in an appropriate language

Nine semester hours of elective credit, chosen in consultation with the advisor from the following: (no more than three courses in the entire minor may be in the same discipline).

Off Campus Interim

On Campus Elective Courses

Art History 243, Economics 237 (Latin American Economics), Geography

240, History 238, 338, Political Science 276, Spanish 308, 309, 310, 361, 362, 363, 370 (Latin America), on campus interim courses with relevant focus on Latin America

Off Campus Elective Courses

Study in Honduras 205, 210, 211, 212, 308, 309, 313/315, 342, 364, 393, Appropriate courses taken at the Universidad Pedagógica in Tegucigalpa or at the Universidad Católica San Pablo in Arequipa may serve as electives or, in certain cases, as substitutes for required courses.

Latin American Studies Program Semester

Appropriate courses taken as part of the Calvin-approved LASP in Costa Rica, SPAN W80 interim in the Yucatan, Off-Campus interim courses with relevant focus on Latin America

Other

Approved language courses in Portuguese or indigenous languages

# Mathematics and Statistics

Professors M. Bolt, R. J. Ferdinands, T. Kapitula, J. Koop, R. Pruim (chair), M. Stob,  
G. Talsma, J. Turner, G. Venema

Associate Professors C. Moseley, T. Scofield

Assistant Professors S. DeRuiter, H. Jung

## MATHEMATICS MAJOR

(34-35 semester hours)

Mathematics 170 or 171

Mathematics 172

Mathematics 256

At least one from Mathematics 231, 271,  
and Statistics 243

Mathematics 361

Mathematics 351 or 355

At least two additional courses totaling at  
least seven semester hours from Math-  
ematics 301, 305, 312, 313, 329, 331,  
333, 335, 351, 355, 362, 365, 380 and  
Statistics 343, 344

An approved interim

Mathematics 391 (taken twice)

### Cognate

(4 semester hours)

Computer Science 106 or 108

All proposed major programs must be designed in consultation with a departmental advisor and approved by the department of Mathematics and Statistics. Major programs must consist of a coherent package of courses intended to serve the student's interests and career goals while meeting the above minimum requirements.

Students with specific educational or career goals should take additional courses. Descriptions of a number of expanded programs—including programs in applied mathematics, pure mathematics, computational mathematics, statistics, and actuarial studies—are available on the departmental Web page.

## SECONDARY EDUCATION

### MATHEMATICS MAJOR

(38 semester hours)

Students desiring to be certified to teach secondary mathematics must complete a major program that includes each of the courses listed below. Students are encouraged to take additional electives.

Mathematics 170 or 171

Mathematics 172

Statistics 243

Mathematics 256

Mathematics 301

Mathematics 329

Mathematics 351

Mathematics 359

Mathematics 361

Mathematics 380

An approved interim

Mathematics 391 (taken twice)

### Cognate

(4 semester hours)

Computer Science 106 or 108

## ELEMENTARY MATHEMATICS MAJOR

(30 semester hours)

Mathematics 221

Mathematics 222

Mathematics 323

Statistics 143 or 243

One sequence from

Mathematics 169, 170, Information  
Systems 141 and 171

Mathematics 171, 172, Information  
Systems 141 or 171

Mathematics 100

Interdisciplinary 110

Approved Mathematics interim

## MATHEMATICS MINOR

(23 semester hours)

Mathematics 171 or 170

Mathematics 172

At least two of Mathematics 231, 256,  
270, 271 and Statistics 243

At least two totaling at least seven semes-  
ter hours from: Mathematics 301, 305,  
312, 313, 331, 333, 335, 351, 355, 361,  
362, 365, 380, Statistics 343, 344

All proposed minor programs must be designed in consultation with a depart-  
mental advisor.

## SECONDARY EDUCATION

### MATHEMATICS MINOR

(25 Semester hours)

Mathematics 170 or 171

Mathematics 172

Mathematics 256

Statistics 243  
 Mathematics 301  
 Mathematics 329  
 Mathematics 361

**Cognate**

(4 semester hours)

Computer Science 106 or 108

Prior to the teaching internship, students must have the approval of the department. Criteria for approval are found in the Teacher Education Program Guidebook, available in the Education Department. Directed teaching in secondary mathematics is available only during the fall semester.

**ELEMENTARY EDUCATION**

**MATHEMATICS MINOR**

(22-23 semester hours)

Mathematics 221  
 Mathematics 222  
 Mathematics 323  
 Mathematics 132 or 171  
 Mathematics 172 or an approved interim  
 Statistics 143 or 243  
 Interdisciplinary 110

The minor for elementary education should be chosen in consultation with a departmental advisor as choices for mathematics courses depend on the student's background.

**GROUP MAJOR**

A group major in science and mathematics meets the needs of some students, particularly those in professional programs. These majors are not appropriate for students who anticipate attending graduate school or who are in teacher education programs. Such group majors require twelve courses in the sciences and mathematics, ten of which must be from two departments with no fewer than four from either, with the remaining two courses chosen from a third department. The chairs of the three departments must approve each program of this type. The following two group majors are pre-approved. Other group majors may be arranged on an individual basis.

**BUSINESS/MATHEMATICS**

**GROUP MAJOR**

(43-45 semester hours)

Business 203  
 Business 204  
 Economics 221

Economics 222  
 Two Business electives  
 Mathematics 170 or 171  
 Mathematics 172  
 Mathematics 256  
 Mathematics 271  
 Statistics 343  
 Statistics 344

**Cognates**

(2-5 semester hours)

Information Systems 171  
 One from Information Systems 151, 153, 221, 141, 271, Computer Science 104, 106, 108, or 112

**MATHEMATICS/ECONOMICS**

**GROUP MAJOR**

(42-44 semester hours)

Economics 221  
 Economics 222  
 Economics 325  
 Economics 326  
 Two Economics electives  
 Mathematics 170 or 171  
 Mathematics 172  
 Mathematics 256  
 Mathematics 271  
 Statistics 343  
 Statistics 344

**Cognates**

(2-5 semester hours)

Information Systems 171  
 One from Information Systems 151, 153, 221, 141, 271, Computer Science 104, 106, 108, or 112

**Honors program**

The departmental honors program leads to graduation with honors in mathematics or mathematics education. Beyond the requirements of the general honors program, these programs require further course work and a senior thesis. Details are available from the department. These programs require careful planning to complete, and students should normally apply for admission to the departmental honors program during their sophomore year at the same time that they submit a major concentration counseling sheet.

**Admission to program**

A minimum grade of C (2.0) in one of Mathematics 231, 243, 256 or 271 is required for admission to a program of concentration in the department.

## Core curriculum

The mathematics core requirement may be met by any of the following: Mathematics 100, 170, 171, 221 or Statistics 143, 145.

## COURSES

### Mathematics (MATH)

**100 Mathematics in the Contemporary World** (3). F, S. An introduction to the nature and variety of mathematics results and methods, mathematics models and their applications, and to the interaction between mathematics and culture. Not open to mathematics and natural science majors. This course fulfills core mathematics requirement.

**132 Calculus for Management, Life, and Social Sciences** (4). S. Functions, limits, and derivatives. Applications of derivatives to maximum-minimum problems, exponential and logarithmic functions, integrals, and functions of several variables. Not open to those who have completed Mathematics 171.

**156 Discrete Mathematics for Computer Science** (4). F. An introduction to a number of topics in discrete mathematics that are particularly useful for work in computer science, including propositional logic, sets, functions, counting techniques, models of computation and graph theory. Applications in computer science. Prerequisite: Computer Science 108 or permission of the instructor.

**169 Elementary Functions and Calculus** (4). F. Mathematics 169 and 170 together serve as an alternative to Mathematics 171 for students who have completed four years of high school mathematics but who are not ready for calculus. Placement in Mathematics 169 or 171 is determined by a calculus readiness test that is administered to incoming first-year students during orientation. Topics include functions and their graphs, polynomial functions, trigonometric functions, exponential and logarithmic functions, limits, derivatives. Prerequisite: four years of high school mathematics.

**170 Elementary Functions and Calculus II** (3). I. A continuation of Mathematics 169. Topics include derivatives, applications of derivatives, and integrals. Historical and philosophical aspects of calculus are integrated with the development of the math-

ematical ideas, providing a sense of the context in which calculus was developed. Prerequisite: Mathematics 169. This course fulfills mathematics core.

**171 Calculus I** (4). F, S. This course serves as an introduction to calculus. Topics include functions, limits, derivatives, applications of derivatives, and integrals. Historical and philosophical aspects of calculus are integrated with the development of the mathematical ideas, providing a sense of the context in which calculus was developed. Prerequisite: either four years of college preparatory mathematics or Mathematics 110. A calculus readiness test is administered by the department during orientation and some students may be placed in 169 on the basis of that test. This course fulfills core mathematics requirement.

**172 Calculus II** (4). F, S. Techniques of integration, applications of integration, infinite sequences and series, parametric equations and polar coordinates, vectors and the geometry of space. Prerequisite: a C- or better in Mathematics 170 or 171. First-year students with advanced placement credit for 171 should normally enroll in section AP.

**190 First-Year Seminar in Mathematics** (1). F. An introduction in seminar format to several different topics in mathematics not otherwise part of the undergraduate program. Topics vary by semester, but will include both classical and recent results and both theoretical and applied topics. The goals of the course are to acquaint students with the breadth of mathematics and to provide opportunity for students interested in mathematics to study these topics together. All first-year students interested in mathematics (regardless of prospective major program) are welcome to register. This course will be graded on a credit/no-credit basis.

**221 The Real Number System and Methods for Elementary School Teachers** (4). F, S. This course provides prospective elementary school teachers with background needed for teaching elementary mathematics. Both content and methodology relevant to school mathematics are considered. Topics covered include the real number system and its sub-systems. Pedagogical issues addressed include the nature of mathematics and of mathematics learning and the role of

problem solving and the impact of technology in the elementary school mathematics curriculum. Prerequisites: Education 102. This course meets mathematics core.

**222 Geometry, Probability, Statistics, and Methods for Elementary School Teachers** (4). F, S. This course is a continuation of Mathematics 221. Both content and methodology relevant to teaching geometry, probability, and statistics in elementary school are considered. Topics covered include basic geometric concepts in two and three dimensions, transformational geometry, measurement, probability, and descriptive and inferential statistics. Pedagogical issues addressed include the place of geometry, probability, and statistics in the elementary school curriculum, use of computers in mathematics, and the development of geometric and probabilistic thinking. Prerequisite: Mathematics 221 or permission of the instructor.

**231 Differential Equations with Linear Algebra** (4). F, S. An introduction to solutions and applications of first and second-order ordinary differential equations including Laplace transforms, elementary linear algebra, systems of linear differential equations, numerical methods and non-linear equations. Prerequisites: a C- or better in Mathematics 172.

**256 Discrete Structures and Linear Algebra** (4). F, S. An introduction to mathematical reasoning, elementary number theory and linear algebra, including applications for computer science. Prerequisites: Mathematics 171 and Mathematics 156 or 172.

**270 An Introduction to Multivariable Calculus** (3). F. Partial derivatives, multiple integrals and vector calculus. This course consists of the first 39 class periods of Mathematics 271 and is intended only for engineers who cannot fit the four-hour Mathematics 271 into their program. Prerequisite: a C- or better in Mathematics 172.

**271 Multivariable Calculus** (4), F, S. Partial derivatives, multiple integrals and vector calculus. Prerequisite: a C- or better in Mathematics 172.

**301 The Foundations of Geometry** (3). S. A study of Euclidean and hyperbolic geometries from an axiomatic viewpoint. Additional topics include transformations, and the construction

of models for geometries. Prerequisite: Mathematics 256 or permission of the instructor.

**305 The Geometry and Topology of Manifolds** (4). F, alternate years. An introduction to the study of manifolds, including both the geometric topology and the differential geometry of manifolds. The emphasis is on low-dimensional manifolds, especially curves and surfaces. Topics include the topology of subsets of Euclidean space, curves and surfaces in Euclidean space, the topological classification of compact connected surfaces, smooth curves and surfaces, curvature, geodesics, the Gauss-Bonnet Theorem and the geometry of space. Prerequisites: Mathematics 270 or 271 and Mathematics 231, 256 or 355.

**312 Logic, Computability, and Complexity** (4). F, alternate years. An introduction to first-order logic, computability and computational complexity. Topics covered include soundness and completeness of a formal proof system, computability and non-computability, and computational complexity with an emphasis on NP-completeness. Also listed as computer science 312. Prerequisite: Mathematics 256.

**323 Teaching Mathematics in the Elementary and Middle School** (2). F, S. A discussion of the methods, pedagogy, and strategies for teaching mathematics in the elementary/middle school. Curricular issues, including discussion of various materials and the use of technology, will be tied to criteria for evaluation of such. Topics of assessment, state and national standards, and lesson development will be examined. The relationship of mathematics teaching and the Christian worldview will be discussed. Field experiences will allow students the opportunity to see the issues raised in the course in the setting of a school. Prerequisites: Mathematics 221, 222, Education 302.

**329 Introduction to Teaching Secondary School Mathematics** (2). S. This course introduces prospective teachers to important curricular and pedagogical issues related to teaching secondary school mathematics. These issues are addressed in the context of mathematical topics selected from the secondary school curriculum. The course should be taken during the spring preceding student teaching. Prerequisite: A 300-level course in mathematics.

**331 Nonlinear Dynamics and Chaos** (4). S, alternate years. Qualitative study of linear and nonlinear ordinary differential equations and discrete time maps including stability analysis, bifurcations, fractal structures and chaos; applications to biology, chemistry, physics, and engineering. Prerequisite: Mathematics 231 or permission of instructor.

**333 Partial Differential Equations** (4). F Offered every third semester. An Introduction to partial differential equations and their applications. Topics Include mathematical modeling with partial differential equations, nondimensionalization, orthogonal expansions, solution methods for linear Initial and boundary-value problems, asymptotic expansions, and numerical solution of partial differential equations. Prerequisites: Mathematics 231 and 270 or 271.

**335 Numerical Analysis** (4). Offered occasionally. Theory and practice of computational procedures Including principles of error analysis and scientific computation, root-finding, polynomial Interpolation, splines, numerical Integration, applications to ordinary differential equations, computational matrix algebra, orthogonal polynomials, least square approximations, and other applications. Also listed as Computer Science 372. Prerequisites: Computer Science 104, 106 or 108 and Mathematics 256.

**351 Abstract Algebra** (4). S. An Introduction to abstract algebraic systems, including groups, rings, and fields, and their applications. Prerequisite: Mathematics 361.

**355 Advanced Linear Algebra** (4). Offered every third semester. Vector spaces, linear transformations, eigenvalues and eigenvectors, inner product spaces, spectral theory, singular values and pseudoinverses, canonical forms, and applications. Prerequisite: Mathematics 256, or both Mathematics 231 and 270 or 271.

**359 Seminar in Secondary Teaching of Mathematics** (3). F A course in perspectives on, principles of, and practices in the teaching of mathematics on the secondary level. This course must be taken concurrently with Education 346. The seminar provides a forum for the discussion of concerns that develop during directed teaching.

**361 Real Analysis I** (4). F The real number system, sets and cardinality, the topology of

the real numbers, numerical sequences and series, real functions, continuity, differentiation, and Riemann Integration. Prerequisites: two mathematics courses numbered 231 or above.

**362 Real Analysis II** (4). S, alternate years. A continuation of Mathematics 361. Topics from sequences and series of functions, measure theory, and Lebesgue integration. Prerequisite: Mathematics 361.

**365 Complex Variables** (4). S. Offered every third semester. Complex numbers, complex functions, integration and the Cauchy integral formula, power series, residues and poles, and conformal mapping. Prerequisite: Mathematics 270 or 271.

**380 Perspectives on Modern Mathematics** (3). S, alternate years. This course explores the historical development of some of the basic concepts of modern mathematics. It includes an examination of significant issues and controversies, philosophical perspectives, and problems on which mathematicians have focused throughout history. Prerequisites: Mathematics 361, biblical foundations I or theological foundations I, developing a Christian mind and philosophical foundations. Not offered 2015–2016.

**390 Independent Study** (1-4). F, I, and S. Independent study of topics of interest to particular students under supervision of a member of the department staff. Open to qualified students with permission of the department chair.

**391 Colloquium** (0). F, S. Meets weekly for an hour for the presentation of various topics in Mathematics, computer science, and related disciplines by students, faculty, and visiting speakers. Prerequisites: two 200-level courses in mathematics.

**395 Senior Thesis in Mathematics** (1-4). F, I, and S. The course requirements include an expository or research paper and an oral presentation on a selected topic in mathematics. Open to qualified students with the permission of the chair.

### Statistics (STAT)

**143 Introduction to Probability and Statistics** (4). F, S. An introduction to the concepts and methods of probability and statistics. The course is designed for students interest-

ed in the application of probability and statistics in business, economics, and the social and life sciences. Topics include descriptive statistics, probability theory, random variables and probability distributions, sampling distributions, point and interval estimation, hypothesis testing, analysis of variance, and correlation and regression. This course fulfills core mathematics requirement.

**145 Biostatistics (4) F and S.** An introduction to the concepts and methods of probability and statistics for students in life science programs. Topics include descriptive statistics, probability theory, random variables and probability distributions, experimental design, sampling distributions, confidence intervals and hypothesis tests, analysis of variance, and correlation and regression. This course meets the mathematics requirement of the core curriculum. This course is an alternative to Statistics 143 for students in certain life science programs. It is a required course for biology and public health majors and is open to others. No student may receive credit for both Statistics 143 and 145.

**241 Engineering Statistics (2) S.** A course in statistics with emphasis on the collection and analysis of data in engineering contexts. Topics include descriptive statistics, experimental design, and inferential statistics. The development of probabilistic models for describing engineering phenomena is emphasized. Statistical software will be used throughout the course. Prerequisite: Mathematics 172.

**243 Statistics (4) S.** Data analysis, data collection, random sampling, experimental design, descriptive statistics, probability, ran-

dom variables and standard distributions, Central Limit Theorem, statistical inference, hypothesis tests, point and interval estimates, simple linear regression. Examples will be chosen from a variety of disciplines. Computer software will be used to display, analyze and simulate data. Prerequisite: Mathematics 172.

**245 Applied Data Analysis (4) F.** This course takes a practical approach to the fitting, assessment, and interpretation of statistical models. Specific topics include obtaining and transforming data, data visualization, the generalized linear model framework, and specific examples of frequently used generalized linear models (multiple regression, ANOVA, logistic regression, and Poisson regression). The approach focuses on specifying appropriate models, using software to obtain model fits and to assess the quality of models, interpreting models, and preparing statistical reports. Prerequisites: with a B- or better: Statistics 143, 145, Psychology 255, Sociology 255; or with a C- or better: Statistics 241, 243, 343, a 5 on the AP Statistics Exam, or permission of instructor.

**343 Probability and Statistics (4) F.** Probability, probability density functions, binomial, Poisson, and normal distributions, central limit theorem, limiting distributions, sample statistics, hypothesis tests, and estimators. Prerequisite: Mathematics 231, 256, 270 or 271.

**344 Mathematical Statistics (4) S.** A continuation of Statistics 343 including theory of estimation, hypothesis testing, non-parametric methods, regression analysis, and analysis of variance. Prerequisite: Statistics 343.



# Medieval Studies

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The interdisciplinary minor in medieval studies aims to inspire students to both appreciate and to examine critically the medieval roots of modern culture. It is a useful introduction to graduate study in any of the curricula in which medieval studies plays a role (medieval studies, history, classics, religion, art history, music, modern languages, etc.) The minor may be taken in conjunction with any major. Students interested should seek faculty advice as specified below.

The group minor in medieval studies is administered by an interdepartmental committee. Members of the committee are F. Van Liere (History), K. Saupe (English), H. Luttkhuizen (Art), T. Steele (Music), and M. Williams (Classics). Interested students should consult a member of the medieval studies minor committee for selection of specific courses for the minor.

## GROUP MINOR IN MEDIEVAL STUDIES

(18 semester hours)

History 263

Intermediate language course

Interdisciplinary 206

Three electives, outside the students' major, from Art History 232, 233, 234, 235, English 310, 337 (Chaucer), French 394, German 390, History 262, 362, Interdisciplinary 198, Latin 101, 102, 201, 205, 206, 391, Music 205, Philosophy 251, 322, Religion 243, 341, Spanish 366.

This minor requires a minimum of 18 regular semester hours (including a three-hour interim course), of which at least one course must be taken in history (History 263), and one course in Latin, a vernacular European language, Greek, or Arabic at the intermediate level. (Ordinarily this last requirement will be met with a course in literature, rather than conversational language study.) The remaining regular course requirements for the minor will be met by courses chosen outside the student's major from among those listed above, to meet the interests and needs of the student.

## COURSES

IDIS 198 **Classical and Medieval Palaeography** (1), offered biennially. This course offers a practical introduction to reading Late Antique, Medieval, and Humanist Latin and vernacular script, from c. 200 ad until c. 1500 ad. We will master reading these scripts, while learning about their historical development and the production of written texts before the invention of the printing press. The script types studied in this course will range from square capital, cursive, uncial and half-uncial, Carolingian minuscule, Anglo-Saxon script, and the various forms of gothic and humanist script, while the texts we read will include classical and patristic texts, vernacular texts, and especially the Latin bible. No prerequisites. Not offered 2015–2016.

IDIS 206 **Introduction to Medieval Studies** (3). I, offered biennially. A classroom introduction to the skills that are specific to the interdisciplinary method of studying the Middle Ages, structured around a specific theme. The theme for 2017 is: The World of the Troubadours. This course is mandatory for those students who have selected a minor in medieval studies, but it is open to anyone with an interest in the Middle Ages. Offered during interim 2017, by Prof. T. Steele (Music).

# Music

Professors \*\*D. Fuentes, H. Kim, C. Sawyer, P. Shangkuan, J. Witvliet

Associate Professors T. Engle, P. Hash, T. Steele (chair), B. Wolters-Fredlund

The Calvin Music Department, as a teaching and learning community, aims for the development of a Christian mind with which to understand, create, and teach music. To accomplish this, the faculty addresses itself to developing musical skills, knowledge, understanding, and discernment, to the end that the richness of musical and pedagogical practices will be shaped by a Christian perspective for lives of service. Recognizing that music is a matter for Christian stewardship, service, and critique, the Music Department is committed to preparing both music majors and non-majors as listeners, performers, composers, worship leaders, scholars, and educators to serve as agents of redemption throughout the Kingdom of God.

Within the liberal arts framework, the Music Department addresses itself to students majoring in music, to general students wishing to increase their understanding and enjoyment of music through study and performance, and to the campus community. Students can major or minor in music, elect a fine arts program in education that includes music, fulfill a fine arts core requirement by taking one of the specified core courses, or take any course for which they are qualified. In addition, any qualified student may participate in ensembles or take private lessons.

Students with any possible plans to study music as a major or minor should enroll in Music 101 in the fall, for this class provides counsel about the various programs and the individual student's qualifications for each. Students who want to take a music course for their arts core credit may choose from Music 101, 103, 106, 107, 203 and 236. Not more than 8 semester hours of credit in applied music and drama may be applied to the minimum requirements for graduation, unless the addition is part of a designated major or minor music emphasis.

The Music Department offers a variety of programs of study leading to the Bachelor of Arts degree (BA) and the Bachelor of Music Education degree (BME). Each of the programs builds on a common core of basic courses and requirements in music. T. Steele is the advisor for general, undecided students considering a major in music. P. Hash counsels undecided students considering a major in music education. All transfer students interested in a major or minor in music must consult with T. Steele, at or before their first registration, to receive counseling into an appropriate sequence of music courses. Such students also must validate, during their first semester at Calvin, their transfer credits in keyboard harmony and aural perception. Those not meeting the minimum standards will be required to enroll in Music 213.

## REQUIREMENTS FOR ALL MUSIC MAJORS

See the Music Department Handbook for details.

### Preparing to be a music major:

Students desiring to be music majors or minors should take a music theory assessment test and audition for ensembles, both of which take place during the summer Passport orientation program. **Such students should also enroll in Music 101 in their first fall semester.** No audition is required to begin the music major program.

### Music major approval

Students who wish to declare a major in music must complete the following minimum requirements, usually during the first year:

1. overall GPA of at least 2.5
2. a grade of C or better in Music 101 and in 108 (and its Lab component)
3. piano proficiency evaluation: either a pass, or if deficient, beginning piano lessons
4. a grade of C or better in two semesters of private music lessons
5. a passing rubric score in the performance jury at the end of the second semester.

Students who wish to emphasize Applied Music, or major in Music Education, must complete additional requirements prior to declaring their major, as detailed in the Music Department Handbook.

### **Piano Proficiency**

Prior to graduation, music majors (BA and BME) must pass levels 1 & 2 of the piano proficiency exam; music education majors (BME) must also pass level 3. The levels of the exam need not be taken in order.

Level 1 – Keyboard performance requirement – perform an intermediate-level piano piece.

Level 2 – Keyboard harmony requirement – playing chord progressions, realizing figured bass and lead sheets at the keyboard, and playing two-part music in all clefs with two hands together. This requirement is met by achieving a passing grade in the keyboard harmony portions of Music 213.

Level 3 – Applied keyboard skills requirement for music education majors – demonstrate ability to play from various scores (choral or instrumental, depending on field of study).

### **Concert and Recital Hour attendance**

Music majors and minors must enroll in Music 180 Recital Hour each semester until the required number of semesters for their program has been completed. As part of this course, music majors must attend four additional concerts or recitals, submitting a music major card for each attendance. See course description for Music 180.

### **GENERAL MUSIC MAJOR (BA)**

(36 semester hours)

Advisor: T. Steele

Music 101

Music 108

Music 205

Music 206

Music 207

Music 208

Music 213

Music 305

Music 308

Ensembles (four semesters)

Private lessons (four semesters, at least two semesters of piano)

Recital Hour: Music 180, including four music major cards per semester (four semesters)

Six additional hours of music electives

Piano proficiency levels 1 and 2

### **MUSIC MAJOR (BA)**

#### **MUSIC THEORY/COMPOSITION EMPHASIS**

(39 semester hours)

Advisor: D. Fuentes

Music 101

Music 108

Music 205

Music 206

Music 207

Music 208

Music 213

Music 240

Music 305

Music 307

Music 308

Music 312

Music 340

Ensembles (four semesters)

Private lessons (four semesters, at least two semesters of piano)

Recital Hour: Music 180, including four music major cards per semester (eight semesters)

Piano proficiency levels 1 and 2

### **MUSIC MAJOR (BA)**

#### **APPLIED MUSIC EMPHASIS**

(46 semester hours)

Advisors: T. Engle (brass, woodwinds, percussion), H. Kim (piano), N. Malefyt (organ), D. Reimer (strings), C. Sawyer (voice)

Music 101

Music 108

Music 205

Music 206

Music 207

Music 208

Music 213

Music 305

Music 308

Ensembles

for voice: two semesters of 181 within an academic year, eight semesters in 131, 141, or 191 including every semester after declaring a music major

for strings: eight semesters in 171 including every semester after declaring a music major

for winds: eight semesters in 151, 161, or

171 including every semester after declaring a music major

for organ: two semesters of 131 or 181 within an academic year, six additional semesters in any faculty directed ensemble

for piano: six semesters in a faculty-directed ensemble, four of which must be in 131, 141, 151, 161, 171, or 191, one semester of 222 (piano accompanying) and a second semester of 222 (piano chamber music)

Private lessons (eight semesters, four semesters at the 300 level).

Recital Hour: Music 180, including four music major cards per semester (eight semesters)

Recitals: perform one half recital and one full recital

Piano proficiency levels 1 and 2

**MUSIC MAJOR (BA)**

**MUSIC HISTORY EMPHASIS**

(45 semester hours)

Advisor: Benita Wolters-Fredlund

Music 101

Music 108

Music 205

Music 206

Music 207

Music 208

Music 213

Music 305

Music 307

Music 308

Music 312

Music 390

Ensembles (eight semesters)

Private lessons (four semesters).

Recital Hour: Music 180, including four music major cards per semester (eight semesters)

Music history or literature electives: six hours

Piano proficiency levels 1 and 2

**GENERAL MUSIC MINOR**

(20 semester hours)

Advisor: T. Steele

Music 101

Music 108

Music 205

Private Lessons (four semesters)

Recital Hour: Music 180 (four semesters)

Music electives (six semester hours, three must be in classroom music courses)

**MUSIC EDUCATION K–12 MAJOR INSTRUMENTAL (BME)**

(66 semester hours)

Advisor: P. Hash

Music 101

Music 108

Music 195

Music 196

Music 197

Music 198

Music 205

Music 206

Music 207

Music 208

Music 213

Music 237

Music 239

Music 305

Music 337

Music 339

Music 341

Music 352

Music 359

Private instrumental lessons (seven semesters)\*

Music 110, 210, 120 or 220 (two semesters or pass level 1 piano proficiency)

Ensembles (seven semesters in 151, 161, or 171)

Recital Hour: Music 180, including four music major cards per semester (seven semesters)

Recitals: perform one half recital

Piano proficiency levels 1, 2, and 3

*\*Students in the BME instrumental program may choose piano or organ as their primary performance area, provided they take 2 hours of applied lessons on a single band or orchestra instrument in addition to piano/organ lessons, and pass an instrumental jury following two semesters of study. Students may not test out of this requirement.*

After general admission to Calvin, students desiring to pursue the music education K–12 comprehensive program will be required to meet certain standards for admission to the BME program. The proposed standards, a list of seven, can be found under resources for students on the Music Department website. These standards are ordinarily

met by the second semester of the sophomore year. Admission to the music education program also requires that the student pass a jury exam on his or her instrument or voice ordinarily by the second semester of the first year. A half recital and a passing grade on the level III piano proficiency test are also required of all music education students prior to directed teaching. See the Teacher Education Program Guidebook for details about this program.

**MUSIC EDUCATION K–12 MAJOR  
VOCAL/CHORAL (BME)**

(66 semester hours)

Advisor: P. Hash

Music 101

Music 108

Music 195

Music 196

Music 197

Music 198

Music 205

Music 206

Music 207

Music 208

Music 213

Music 237

Music 239

Music 305

Music 338

Music 339

Music 341

Music 351

Music 359

Private lessons (seven semesters)\*

Music 110, 210, 120 or 220 (two semesters or pass level 1 piano proficiency)

Ensembles (seven semesters in 131, 141, or 191)

Recital Hour: Music 180, including four music major cards per semester (seven semesters)

Recitals: perform one half recital

Piano proficiency levels 1, 2, and 3

*\*Students in the BME vocal program may choose piano or organ as their primary performance area provided they take two hours of applied voice in addition to piano/organ lessons, and pass a vocal jury following two semesters of study. Students may not test out of this requirement.*

After general admission to Calvin, students desiring to pursue the music educa-

tion K–12 comprehensive program will be required to meet certain standards for admission to the BME program. The proposed standards, a list of seven, can be found under resources for students on the Music Department website. These standards are ordinarily met by the second semester of the sophomore year. Admission to the music education program also requires that the student pass a jury exam on his or her instrument or voice ordinarily by the second semester of the first year. A half recital and a passing grade on the level III piano proficiency test are also required of all music education students prior to directed teaching. See the Teacher Education Program Guidebook for details about this program.

**FINE ARTS ELEMENTARY MINOR\***

(24 semester hours)

Art Education 315

Communication Arts and Sciences 214

Education 210

Music 239

Elementary Dance Interim or PER 150

One from Art 153, Studio Art 250, Art History 101, 102, Art or Art History interim

One from Communication Arts and Sciences 190, 200, 203, 217, 218, 303, 316, CAS Interim

One from Dance 202, 310, 330, or Dance interim

One from Music 100, 103, 106, 107, 108, 203, 120 (2), 130 (2), 190 (2), or a Music interim

JoAnn VanReeuwijk (Art), Phil Hash (Music) and Debra Freeberg (CAS) are advisors for the fine arts minor.

*\*This program does not certify graduates to teach music.*

**MINISTRY LEADERSHIP MINOR MUSIC IN WORSHIP EMPHASIS**

(20-21 semester hours)

Advisors: C. Sawyer and T. Steele

The Calvin Music Department is delighted and eager to serve students with interests in exploring music in Christian worship. Calvin College offers a unique set of opportunities in this area, through the close partnership of the Music Department, Religion Department, the Department of Congregational and Ministry Studies, the

Calvin Institute of Christian Worship, and the Campus Ministry Office.

Students are advised to select a Music Major program (General Music, Music Theory/Composition, or Applied Music), along with a Ministry Leadership Minor with an emphasis in music in worship. This program provides students with strong skill development as a musician and an integrated view of ministry, culminating in an internship in a congregation. Please see the CMS department in the catalog for course offerings.

**COURSES (MUSC)**

**100 Music Theory Fundamentals** (2). F. This course introduces the student to the rudiments of music theory: rhythm, scales, key signatures, intervals, melody, chords and tonality. These rudiments are learned by extensive drill, both in and out of class, for the purpose of developing an understanding of and facility in using the fundamental building blocks of tonal music. Drills include singing, playing at the keyboard, analyzing, writing musical notation, ear training, and computer lab drill. Progress is evaluated by daily recitations, daily written assignments, music lab practice sessions, quizzes and a final examination. Class size is limited with priority given to those requiring this course as preparation for Music 108. Prerequisite: ability to read notation in either the treble or bass clef.

**101 Introduction to the Musical World** (3). F. This course serves as the gateway course for the music major/minor and will help music students to recognize the many roles that music plays in human life and to evaluate them in light of human flourishing and Christian discipleship, appreciating the skills, knowledge, disciplines, attitudes, and virtues needed to become effective musical servants. This course is intended for music majors and minors. Prerequisites: basic skill in reading music notation, respectable high-school level of performance in voice or an instrument, and/or permission of the instructor.

**103 Understanding and Enjoying Music** (3). F, S. This is an introductory course in historically-informed critical and perceptive listening to music. The relationship between musical style and culture is examined as is the forming of style by the manner in which the ingre-

dients and elements of music are employed. Western art music is emphasized but also included are contemporary popular music and either pre-modern music or non-Western music. No previous musical training is required.

**106 American Music** (3). F. A survey course of American Music for domestic, church, concert, and entertainment uses, emphasizing folk, classical and popular music from a variety of American musical traditions. These traditions include hymns, spirituals, gospel, blues, jazz, rock, hip-hop and classical music. No previous musical training is required.

**107 World Music** (3). S. This is a study of select musical cultures of Asia, the Middle East, Africa, Europe and the Americas, with a focus on their various musical styles (traditional and contemporary) and the roles of music in these cultures. The course will make use of recordings and films, and requires oral presentations as well as field trips to live world music concerts. No previous musical training is required.

**108 Music Theory I** (4). S. A study of tonal harmony covering triads, inversions, non-harmonic tones, cadences, tonal theory, and dominant seventh chords. In addition to part writing and analysis, this course includes ear training, sight-singing, and keyboard harmony in laboratory sessions. Prerequisites: Music 100 (or a passing score on the music theory assessment test).

**180 Recital Hour** (0). F, S. Weekly seminar for music majors and minors. Provides experience in public performance for music students as well as opportunities to hear performances of a wide range of music literature. Additional topics related to music study offered from time to time. Required attendance for all music majors and minors, plus four additional approved concerts or recitals each semester for all music majors. Meets throughout the semester on Thursdays at 1:30 p.m.; schedule announced at the beginning of each semester.

**195 String Methods** (2). S, alternate years. Class lessons on all string instruments for the instrumental music education major. Emphasis is on the methods for teaching string instruments. Elementary playing skills are developed.

**196 Brass Methods** (2). F, alternate years. Class lessons on all brass instruments for the instrumental music education major. Emphasis is on the methods for teaching brass instruments. Elementary playing skills are developed.

**197 Percussion Methods** (2). F, alternate years. Class lessons on percussion instruments for the instrumental music education major. Emphasis is on the methods for teaching percussion instruments. Elementary playing skills are developed. Not offered 2015–2016.

**198 Woodwind Methods** (2). S, alternate years. Class lessons on all woodwind instruments for the instrumental music education major. Emphasis is on the methods for teaching woodwind instruments. Elementary playing skills are developed. Not offered 2015–2016.

**203 Popular Music** (3). F A survey course exploring the historical development, stylistic variety, and cultural significance of western popular music from the mid-nineteenth century to today, including folk music, minstrelsy, blues, jazz, musicals, rock, hip-hop and related genres. No previous musical training is required.

**205 Music History and Analysis I** (3). F, alternate years. A study, via listening, score study, and source readings, of music of Western civilization prior to 1750. After a brief introduction to world music, the course continues with study of musical thought in antiquity and the early Christian era, Gregorian chant, and the principal repertoires of polyphony through the Baroque period. Prerequisites: Music 101 and 108 or permission of the instructor. Not offered 2015–2016.

**206 Music History and Analysis II** (3). S, alternate years. This course is a study of music of Western civilization from 1750 to 1950. The course emphasizes the relationship of music to cultural and intellectual history, beginning with the impact of Enlightenment thought on music, continuing with the Romantic revolution, and concluding with the various 20th century continuations of, and reactions to, Romanticism. Prerequisites: Music 101 and 108 or permission of the instructor.

**207 Music Theory II** (3). F A continuation of Music Theory I covering chromatic harmony. Prerequisite: Music 108.

**208 Music Theory III** (3). S A continuation of Music Theory II covering chromatic harmony, post-tonal techniques, set theory, and serialism. This course includes analysis, part writing, and some composition. Prerequisite: Music 207.

**213 Aural Perception** (1). F Provides instruction in musicianship skills, including

aural perception, dictation, keyboard harmony, and improvisation. Covers level two piano proficiency skills. Normally taken concurrently with Music 207. Prerequisite: Music 108 and CR in Music 108 Lab.

**236 Music in Worship** (3). F, alternate years. A historically and theologically-informed course on Christian congregational song, ranging from Old Testament psalms to contemporary praise-worship songs, from traditional Western hymnody to global worship songs, with some attention to cultural context and practical issues. Course requirements include readings, seminar presentations, reports on hymn recordings and visits to churches, as well as practical assignments. No musical prerequisites. Not offered 2015–2016.

**237 Conducting** (2). F A course in basic conducting, normally taken in the sophomore year. Prerequisite: Music 101 or sophomore standing with concurrent enrollment in Music 101.

**239 Teaching General Music** (3). S An introduction to current methods of teaching general music in public and private schools. Students will gain knowledge of teaching methods and materials used in classroom music including textbooks, instruments, and software. Philosophy, curriculum, and administration in relation to the general music program will be discussed. This course takes the place of Music 238 for music education majors and is an elective for elementary fine arts majors. Prerequisite: Music 101, sophomore status, and the ability to read music proficiently.

**305 Music History and Analysis III** (3). F, alternate years. The course explores the issues that contemporary musicians face regarding expression and communication, focusing on the way these issues have been and are being redefined, answered in new ways, experimented with, and even dismissed since c. 1950. While the course focuses on art music, there is considerable attention given to film and popular music as well. Prerequisites: Music 101 and 108 or permission of the instructor.

**307 Music Form and Syntax** (3). S, alternate years. A study of the most common ways composers set forth and work out musical ideas, including both the large-scale and local aspects of musical form. Students will make inquiry into the syntactical meaning of various musical cues and gestures and sample various

means of presenting a formal analysis, using basic reductive techniques, outlines, diagrams, analogy, and oral description in their assignments, and projects. Prerequisite: Music 208. Not offered 2015–2016.

**308 Order, Meaning, and Function** (3). S, alternate years. This course serves to integrate that which was learned in the music history and music theory sequences and to nurture Christian reflection on aesthetic and social issues in music. The first part of the course focuses on musical structure and the composer's activity of finding order in the world of sound and of the responsibility students have as stewards of the gift of sound. The second part of the course turns attention to meaning in music, its functions in societies past and present, and questions concerning the nature and extent of its influence on people. In both parts of the course, specific pieces of music are studied in some detail. Prerequisites: Music 208 and 305 or permission of the instructor. Not offered 2015–2016.

**312 Tonal Counterpoint** (3). S, alternate years. A practical study of melodic writing and counterpoint, using the instrumental works of J.S. Bach as models. Prerequisite: Music 207. Not offered 2015–2016.

**334 Vocal Literature** (3). Offered upon sufficient demand, otherwise by Independent Study; check with the Music chair. A survey of classical vocal literature, focusing on solo literature from the late Renaissance period to the Modern era. The course acquaints students with a broad range of song repertoire from composers of Germany, France, Italy, Spain, Britain, Russia, Latin America, Africa, Asia, and the United States. The course explores suitable literature for beginning singers to advanced vocal performers. Most sessions feature student presentations. Required of Music majors with a voice performance concentrate and open to other music majors and non-majors with substantial vocal background or interest in vocal literature. Prerequisites: two semesters of college voice lessons and/or permission of the instructor.

**335 Piano Literature** (3). Offered upon sufficient demand, otherwise by Independent Study; check with the Music chair. A study of the standard piano literature from 1700 (Bach) to the present. The course also includes the ba-

sic issues of piano musical styles, performance practices, and development of the piano as an instrument. Required of Music majors with piano performance concentration and open to other Music majors and non-majors with substantial piano background and interest in piano. Prerequisites: two semesters of college piano lessons or approval of the instructor.

**337 Instrumental Conducting** (2). S, alternate years. A course in advanced conducting techniques appropriate to bands and orchestras. Prerequisites: Music 237 and proficiency on a band or orchestra instrument. Not offered 2015–2016.

**338 Choral Conducting** (2). S, alternate years. A course in advanced conducting techniques appropriate to choirs. Students will be required to conduct some rehearsals and performances of choral ensembles outside of class hours. Prerequisite: Music 237. Not offered 2015–2016.

**339 Curriculum and Instruction in Music Education** (3). F, alternate years. Comprehensive examination of philosophy, learning theories, curriculum design, administration, and current trends in elementary and secondary music education. Topics include designing instruction for learners with special needs, assessment, professional conduct and development, classroom management, and program development. This course is required of bachelor of music education majors and music education minors.

**341 Vocal-Choral Pedagogy** (3). F, alternate years. Offered upon sufficient demand, otherwise by Independent Study; check with the Music chair. The course is designed to provide practical study in vocal-choral training and rehearsal techniques, which help to develop singing skills in the classroom and in the ensemble. Lectures, demonstrations, and discussions focus on vocal techniques, which develop healthy singing and pleasing tone quality in children, adolescents, and adults. Course work includes listening, textbook readings, written reports on field trips, and observations of off-campus choral ensembles. In addition, each student will prepare demonstrations of conducting and applying the vocal techniques required for all age levels.

**351 Choral Literature and Materials** (3). F, alternate years. A study of the philosophical,



aesthetic, and practical problems involved in choosing significant and appropriate repertoire for study and performance in all levels of choral programs. Criteria for choosing quality music and pedagogical methods are examined. Emphasis is placed on independent oral and written presentations.

**352 Instrumental Literature and Materials**

(3). S, alternate years. A study of the practical problems and issues involved in choosing appropriate music literature for study in elementary, junior high, and high school band/orchestra programs. Attention is also devoted to other relevant issues, including (but not limited to) standards-based education, comprehensive musicianship, score study, rehearsal planning and technique, festival preparation, and program administration. Emphasis is placed on independent oral and written presentations.

**353 Diction in Singing** (3). Offered upon sufficient demand, otherwise by Independent Study; check with the Music chair. A study of the International Phonetic Alphabet, as well as the basic rules and guidelines for singing in the English, Italian, Latin, French, and German languages. Prerequisites: limited to music majors or minors or by the permission of the instructor.

**359 Seminar in Music Methods** (3). S. A seminar taught in conjunction with Education 346 involving general problems of pedagogy, as well as the specific methods for teaching music in rehearsal and classrooms. The seminar provides a forum for the discussion of problems that develop during directed teaching.

**390 Independent Study.** Prerequisite: permission of the department chair.

**Private lessons**

Instrument	30 min beginner (0 credit)	30 min intermediate (0/1 cr)	60 min intermediate (0/2 cr)	60 min advanced (0/2/3 cr)
Organ	010	110	210	310
Piano	020	120	220	320
Voice	030	130	230	330
Trumpet	042	142	242	342
French Horn	043	143	243	343
Trombone	044	144	244	344
Euphonium	045	145	245	345
Tuba	046	146	246	346
Percussion	050	150	250	350
Violin	062	162	262	362
Viola	063	163	263	363
Cello	064	164	264	364
String Bass	065	165	265	365
Guitar	066	166	266	366
Harp	-----	-----	267	367
Flute	072	172	272	372
Oboe	073	173	273	373
Clarinet	074	174	274	374
Bassoon	075	175	275	375
Saxophone	076	176	276	376
Recorder	077	177	277	----
Harpsichord	092	192	292	----



**000-Level**

- 12 half-hour lessons per semester
- Beginning-level studies in technique, musicianship, and repertoire
- 0 credit hours
- Attend studio class as scheduled by instructor in addition to lessons
- No jury exams, unless needed to advance to 100-Level

**100-Level**

- 12 half-hour lessons per semester
- Intermediate college-level studies for music majors/minors or elective students
- 1 credit hour (or for 0 credit to avoid tuition overload fee)
- Attend studio class as scheduled by instructor in addition to lessons
- Jury exam every other semester

**200-Level**

- 12 hour-long lessons per semester
- Intermediate college-level studies for music majors/minors or elective students
- 2 credit hours (or for 0 credit to avoid tuition overload fee)
- Attend studio class as scheduled by instructor in addition to lessons
- Jury exam at the end of first year, thereafter every semester

**300-Level** (*Registration for 300-level, advanced music lessons, requires approval by the appropriate performance area faculty and will be added only as needed. To register for 300-level music lessons, please contact the Music Department.*)

- 12 hour-long lessons per semester
- Advanced college-level studies ordinarily for third- and fourth-year students
- Ordinarily two credit hours or three credit hours in the semester of a half- or full-recital (or for 0 credit to avoid tuition overload fee)
- Attend studio class as scheduled by instructor in addition to lessons
- Jury exam every semester except during a recital semester

**221 Piano Accompanying in Worship** (1/0). F, S. Private lessons in effective lead-

ership of congregational singing from the piano. Also includes instruction in other kinds of accompanying that occurs in worship and some study of appropriate solo repertoire. These lessons do not fulfill the private lessons requirement for piano performance concentrates (regular lesson fees apply).

**240 Songwriting, Composing, and Film-scoring Lessons** (1). Private composition lessons are offered each semester that will focus on individual student projects such as songwriting, orchestration, arranging, and composing of instrumental sonatas, choral anthems, and film scores, etc. Prerequisite: Music 108 or permission of the instructor, based on an acceptable portfolio of three compositions. (\$25 fee)

**340 Songwriting, Composing, and Film-scoring Lessons** (2). Same as Music 240, except these lessons are weekly hour-long lessons. (\$50 fee)

**Ensembles**

Membership in ensembles is open to Calvin students who meet the requirements of musicianship. All students who want to participate in any of the music ensembles at Calvin may audition during the summer Passport orientation sessions, or by special arrangement with the conductor prior to each semester.

All ensembles, except String Ensemble, carry academic credit. Ensembles may not be audited. If a student is already registered for a full credit load, they may petition the music department to register for the ensemble for 0 credit. See the Music Department Handbook for more details.

**115 Flute Choir** (.5). F, S. Representative works in flute choir literature are studied and prepared for concert and church performances. Students have the opportunity to use Calvin's alto and bass flutes. Meets once a week and is open to students in all class levels who wish to participate. Not offered 2015–2016.

**116 Handbell Ensemble** (.5). F, S. Representative works in handbell literature are studied and prepared for concert and church performances. Uses a five-octave set of Malmark handbells and three octaves of choir chimes. Meets once a week and is open to any musician who reads music well. Not offered 2015–2016

**117 Jazz Band (.5).** F, S. Representative works in jazz band literature are studied and prepared for concert performance. Meets twice a week and is open to students in all class levels who meet the requirements of musicianship.

**118 String Quartet (0).** F, S. Representative works in string quartet literature are studied and prepared for performance. A faculty coach meets with the ensemble weekly to provide instruction. Open to students in all class levels who wish to participate.

**131 Campus Choir (1).** F, S. Study and performance of choral literature related to the practice of Christian worship throughout the history of the church and in many cultures. Emphasis on vocal and musical development, as well as on the theological, historical, and liturgical dimensions of selected choral repertoire. Open to all students who meet the requirements of voice and musicianship.

**141 Capella (1).** F, S. Representative works in the field of choral literature are studied and prepared for concert performance. Membership is maintained at a set limit and is open only to those who meet the demands of voice, sight reading, and choral musicianship. Prerequisite: ordinarily one year of experience in a college choir.

**151 Symphonic Band (1).** F, S. Representative works in the chamber wind and concert band literature are studied and prepared for concert performance. Meets three times weekly and is open to all students who wish to participate in a concert band.

**161 Wind Ensemble (1).** F, S. Representative works in the chamber wind and concert band literature are studied and prepared for concert performance. Meets four times weekly. Membership is limited to a set instrumentation and is open to all students who meet the demands of musicianship.

**171 Orchestra (1).** F, S. Representative works in the field of chamber and symphony orchestra literature are studied and prepared for concert performance. Open to all students via live audition who meet the demands of musicianship.

**181 Oratorio Chorus (.5).** F. The study of representative works of the great masters of choral writing with a view to public performance with orchestra. Handel's Messiah is performed annually at Christmas. Open to all who meet the requirements of voice and musicianship.

**182 Gospel Choir (1).** F, S. Faculty directed vocal ensemble performing representative music in this particular genre and in preparation for concert appearances. Membership is open to students, faculty, staff, and alumni.

**191 Women's Chorale (1).** F, S. A women's honor choir open to all classes devoted to singing a wide range of challenging treble literature, both sacred and secular. Membership is maintained at a set limit and is open only to those who meet the demands of voice, sight reading, and choral musicianship. This ensemble tours, presents concerts and leads worship services.

**193 Collegium Musicum (.5).** F, S. An ensemble for the study and performance of instrumental and vocal music of the Medieval, Renaissance and Baroque periods. Reproductions of early wind, string, percussion, and keyboard instruments are used. Open to all students, staff, faculty, and community members by audition. No previous experience in early music performance is necessary. Rehearses two hours per week. Not offered 2015–2016.

**222 Piano Accompanying and Chamber Music (1).** F, S. Piano accompanying involves the study of piano-accompanied literature, plus the actual accompanying throughout the semester of select private voice students. Piano Chamber Music includes the study of literature for piano four hands, two pianos and works for the piano with other instruments such as piano trios. This ensemble experience does not fulfill the private lessons requirement for piano performance concentrates. Open for piano students, with permission of the instructor.

# Nursing

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Professors M. Molewyk Doornbos, C. Feenstra (chair), C. Rossman

Associate Professors \*A. Ayoola, M. Flikkema, B. Timmermans

Assistant Professors R. Boss-Potts, E. Byma, J. Lubbers, J. Moes, G. Zandee

The Calvin Department of Nursing, in sharing the mission of Calvin, seeks to engage in professional nursing education that promotes lifelong Christian service. Students will be prepared to be entry-level professional nurses. The objectives of the nursing curriculum are to assist the student to acquire the knowledge, the competencies and abilities, and the commitments necessary to practice as a Christian professional nurse. The context for nursing education includes the learning community of the college as well as the health care community, the professional nursing community, and the world community in which Christian service takes place. Health promotion and health protection with individuals, families and communities will be the major focus of the program. Challenging practicum experiences will occur in a variety of settings such as communities, clinics, schools, hospitals, and rehabilitation centers. Graduates of the program will receive a BSN and be prepared to take the National Council Licensing Examination for Registered Nurses (NCLEX-RN). Satisfactory scores on the NCLEX-RN will enable a student to become a Registered Nurse (RN). The Department of Nursing is approved by the Michigan State Board of Nursing and accredited by the Commission on Collegiate Nursing Education (CCNE).

## THE NURSING PROGRAM

The two-year pre-nursing curriculum requires nine courses in the natural and social sciences that provide the foundation for professional nursing. These courses include Biology 141, 205, 206, 207, Chemistry 115, Health Education 254, Psychology 151, 201, and Sociology 151. In addition, twelve to fourteen liberal arts courses are required. Foreign language is a component of the liberal arts core. Students are required to have either two years of high school foreign language with grades of C or better or one year of college level foreign language. If a student needs to take a foreign language at Calvin, it should be taken during the first or second year.

The upper division nursing major is a two-year sequence normally taken in the junior and senior years. It consists of thirteen courses distributed over four semesters with 12 semester hours of course work required each semester. While students taking only nursing major courses are considered full-time during those four semesters, elective courses may also be taken during these semesters.

Those interested in nursing should indicate this at the time they begin their studies at Calvin. They will then be assigned to an academic advisor from the Nursing Department.

### Early Admission

A high school graduate interested in nursing is eligible for early admission to the nursing major at Calvin College. The student must meet the following criteria:

- A composite ACT of equal to or greater than 28 or
- An SAT critical reading plus math score of equal to or greater than 1260 or
- Average marks of 91% or higher from a Canadian high school
- Students must specify a nursing major on their Calvin College application and submit their final Early Admission qualifying ACT, SAT, or marks from a Canadian High School on or before Feb 1st prior to Calvin admission for their freshman year.

In order to maintain early admission status, a student, at the Calvin College Department of Nursing application deadline, must have:

- A 3.5 GPA in the nursing prerequisite courses at Calvin
- A 3.3 cumulative GPA at Calvin
- Completed admission requirements (i.e. criminal background check, disciplinary check, drug screen) as specified in the Calvin catalog of the year of the student's admission to Calvin.

**Regular Admission Process**

Application to the upper division nursing major normally occurs during the second semester of the sophomore year. Applications are due on January 15th for the class beginning the following September. Applicants who submit after the deadline will be considered on a space available basis only. Application forms are available in the Nursing Department office or on the departmental website.

In order to apply to the nursing program, students must have the following:

- At least sophomore standing (greater than or equal to 27 hours) at the application due date.
- Completed six nursing prerequisite courses at the application due date.
- A minimum overall cumulative grade point average (GPA) of 2.8 at the application due date.
- A minimum pre-nursing GPA (GPA acquired from the nine pre-nursing courses) of 2.8 at the application due date.
- A minimum grade of C on each of the prerequisite courses at the application due date.
- No more than one repeat per required nursing pre-requisite course. No more than two of the nursing pre-requisite courses may be repeated.
- No more than one withdrawal across the nine pre-requisite courses except for documented extenuating circumstances.
- Be 18 years of age or older by September 1 of application year.

**Students should also take note of the following policies:**

- Prerequisite natural science courses must have been completed within the last seven years.
- Preference will be given to applicants who have completed or will complete all nine nursing prerequisite courses at Calvin.
- Preference will be given to applicants who have completed more than six prerequisite courses at the time of application.
- Preference will be given to students who have not repeated nursing pre-requisite courses.
- Consideration will be given to applicants who have made repeated applications to the nursing major.
- Applicants who submit applications after the due date will be considered on a space available basis.
- Prerequisite courses in progress must be completed by the end of Calvin College's second summer session with a minimum grade of a C.
- All admissions are contingent on maintaining admission criteria up to beginning the nursing program
- All transcript grades at the time of application are final and alterations will not be accepted after the time of application
- Enrollment in the upper division nursing major is also contingent upon successful completion of a criminal background check, and drug screen.

It is important to note that completion of the pre-nursing courses and achievement of the minimum criteria does not guarantee admission into the nursing major. Enrollment in the final two years is limited and thus the admission process is selective.

**Transfer Students**

Students who have transferred to Calvin from some other college or university will be considered Calvin students (rather than as transfer students) if they will have completed two semesters of full time academic work at Calvin by the time they begin the upper division major.

Students desiring to transfer to Calvin for the upper division major, who have completed course work judged by the department to be equivalent to the nine required pre-nursing courses, will be considered for admission to the nursing program after qualified students from Calvin have been accepted into the program.

Applicants for admission, who are graduates of Calvin, will be given equal consideration for admission with current Calvin students.

## Transportation

Classroom and laboratory experiences take place on the Calvin campus. Practicum experiences during the final two years occur at a variety of sites in the greater Grand Rapids area. Students are responsible for their own transportation to those settings. While students may be able to carpool with others for some practicum experiences, there will be occasions throughout the junior and senior years when personal transportation will be necessary.

## Costs

Nursing students will be charged Calvin tuition. In addition, a fee will be assessed for each nursing practicum course. The fee for 2015–2016 will be \$1300 per practicum course. Students normally take one practicum course in each semester of the two-year upper division major.

Prior to beginning the nursing practicum courses, students will need to buy uniforms, name tags, a stethoscope, a blood pressure cuff, and complete an American Heart Association Healthcare Provider CPR course. Additional costs will be incurred for health related items such as immunizations and titers as required by the practicum agencies.

## Additional Requirement

Students will participate in a departmental program entitled Promoting All Student Success (PASS). As a component of PASS, students will take a series of standardized tests during the four semesters of the upper division nursing major. These tests are designed to prepare students to take the NCLEX-RN upon graduation. Each test must be passed at the prescribed level. In the event a student does not achieve the necessary score, she/he will be given individual assistance for remediation. The department will issue the required “Certification of Completion” to the State Board of Nursing upon completion of all required courses and completion of all PASS program requirements.

## Required Courses

<i>*First Year</i>	<i>Semester hours</i>
Biology 141, 207	8
Chemistry 115	4
Psychology 151	3
Sociology 151	3
English 101	3
Foundations of information technology	1
Developing a Christian mind (interim)	3
Statistics 143 or 145	4
Arts core	3
Physical education core	1
 <i>*Second year</i>	 <i>Semester hours</i>
Biology 205, 206	8
Psychology 201	3
Health education 254	3
Philosophical foundations core	3
Literature core	3
Biblical/theological foundations core	3
History of the west and the world core	4
Rhetoric in culture core	3
Physical education core	1
Interim elective	3

\*Note: Students are required to have either two years of high school foreign language with grades of C or better or one year of college level foreign language. If a student needs to take a foreign language at Calvin, it should be taken during the first or second year.

## Nursing Courses

<i>Third Year</i>	<i>Semester hours</i>
Nursing 307	4
Nursing 308	4
Nursing 309	4
Nursing 327	4
Nursing 328	4
Nursing 329	4
Electives	0-8
Interim elective	3

  

<i>Fourth Year</i>	<i>Semester hours</i>
Nursing 357	4
Nursing 358	4
Nursing 359	4
Nursing 377	4
Nursing 378	1
Nursing 379	4
Nursing 380	3
Electives	0-8

Note: The formal requirements for a Calvin bachelor's degree include the following: Successful completion of 124 semester hours, completion of three interim courses of three credit hours or more, completion of the designated program of study and the designated core, and a minimum grade point average of 2.0 both overall and in the program of concentration.

### COURSES (NURS)

**307 Theory: Community Based and Mental Health Nursing** (4). F. In this theory course, students will explore the theoretical foundations of the discipline of nursing, basic concepts of community based nursing, and mental health promotion and protection of individuals across the lifespan in the context of their families and communities. Prerequisites: limited to students who have been admitted to the upper division nursing major.

**308 Strategies: Community Based and Mental Health Nursing** (4). F. This course provides students with the opportunity to develop strategies for health promotion and health protection for use in community based nursing and mental health nursing. Students will develop basic competency in health assessment, communication, technical skills, nursing informatics, the nursing process, and critical thinking. Students will be introduced to basic principles of pharmacology as well as the various categories of psychotropic drugs. Prerequisites: limited to students who have been admitted to the upper division nursing major.

**309 Practicum: Community Based and Mental Health Nursing** (4). F. This practicum course provides the student with an introduction to community based nursing as well as the opportunity to implement strategies to promote and protect the mental health of persons across the lifespan. Students will assume basic roles of the professional nurse and utilize skills of assessment, communication, critical thinking, and nursing process to design and provide empirically based nursing care to individuals in a variety of acute care and community-based settings. Prerequisites: limited to students who have been admitted to the upper division nursing major.

**327 Theory: Pregnant Women, Infants, Children, and Adolescents** (4). S. This theory course will focus on health promotion and health protection concepts for pregnant women, infants, children, and adolescents in the context of their families and communities. Topics will include primary, secondary, and tertiary health protection and health promotion from the perspective of community based care. Prerequisites: Nursing 307, 308, and 309.

**328 Strategies: Pregnant Women, Infants, Children, and Adolescents** (4). S. This course

provides students with opportunities to develop health promotion and health protection strategies in caring for pregnant women, infants, children, and adolescents. Students will develop knowledge and skills in health and cultural assessment, communication, nutrition, pharmacology, psychomotor activities, and nursing informatics systems related to care of pregnant women, infants, children, and adolescents. Prerequisites: Nursing 307, 308, and 309.

**329 Practicum: Pregnant Women, Infants, Children, and Adolescents (4).** S. The student will utilize the nursing process to promote and protect the health of pregnant women, infants, children, and adolescents in the context of their families and communities. Students will spend six weeks with pregnant women and infants and six weeks with children and adolescents in both acute care settings and a variety of community settings. Students will have opportunities to apply knowledge of health promotion and primary, secondary, and tertiary health protection strategies. The focus of the course is on engagement in clinical decision making skills and problem solving in working with these clients. Prerequisites: Nursing 307, 308, and 309.

**357 Theory: Young, Middle, and Older Adults (4).** F. This course will focus on the concepts of health promotion and health protection for young, middle, and older adults in the context of their families and communities. Topics will include primary, secondary, and tertiary health protection and health promotion including community based care and role development. The student will learn about partnerships with adults to actively promote health as well as protecting health during times of acute and chronic illness. Prerequisites: Nursing 327, 328, and 329.

**358 Strategies: Young, Middle, and Older Adults (4).** F. This course provides the student with opportunities to develop health promotion and primary, secondary, and tertiary health protection strategies in care delivery for adults. Students will develop knowledge and skills in health and cultural assessment of adults, pharmacology, communication, nutrition, psychomotor activities, and nursing informatics systems related to care of adult clients. Prerequisites: Nursing 327, 328, and 329.

**359 Practicum: Young, Middle, and Older Adults (4).** F. The student will utilize the nursing process to promote and protect the health of adults in the context of their families and communities. Students care for young, middle, and older adults in acute care settings and visit a variety of community settings. Students will have opportunities to apply knowledge of health promotion and primary, secondary, and tertiary health protection theory and strategies. The focus of the course is on engagement in clinical decision making skills and problem solving with adult clients. Prerequisites: Nursing 327, 328, and 329.

**377 Theory: Community Focused Nursing and Leadership/Management (4).** S. This theory course is focused on health promotion/health protection for the community as client and leadership/management principles that are used by the professional nurse. Prerequisites: Nursing 357, 358, and 359.

**378 Strategies: Synthesis of Nursing Care across the Lifespan (1).** S. In this nursing laboratory course, students will synthesize techniques of health promotion and health protection for and with individuals, families, and groups across the lifespan in complex health situations. Students will focus on critical thinking and decision making principles in nursing practice. The course will include multifaceted, laboratory simulations that require students to analyze and synthesize assessment data and design care with other health care professionals. Students will integrate their knowledge of the Christian perspective, core virtues, and diversity into the care that they design. Prerequisites: Nursing 357, 358, and 359.

**379 Practicum: Community Focused Nursing and Leadership/Management (4).** S. This course will afford students the opportunity to partner with communities as well as interdisciplinary groups of health care providers for the purpose of promoting and protecting health. Partnerships with communities offer opportunities for the student to assist the community to develop the best health care possible for diverse cultural groups. Partnerships with interdisciplinary staff members allow for principles of management and leadership to be integrated into nursing practice. Prerequisites: Nursing 357, 358, and 359.



**380 Critical Reflections** (3). S. (capstone course). This reflective course will lead the student into inquiry about the relationship between Christian faith and the discipline of nursing. It will consider how the Reformed Christian worldview informs the metaparadigm of nursing as well as current issues facing the profession. Prerequisites: Nursing 357, 358, and 359.

**385 Nursing Internship (Curricular Practical Training-CPT)** (0). This course is an optional independent study course, in which students will participate in off-campus internships in acute or long term care settings during summer months or during the academic year to complement their formal learning experiences. They will work a minimum of 80 hours over the summer, or during a semester. Prerequisites: Nursing 307, 308, and 309, GPA of 2.5 or higher. Application

for approval of activities must be confirmed by the department's internship coordinator prior to the internship.

**482 Advanced Roles in Nursing** (1). S. This seminar will explore the various graduate school options within the discipline of nursing with a specific focus on nursing research and advanced practice. It will investigate the process of graduate education from application to the acquisition of a position following graduate school. Graduate education, national priorities for nursing research, translational research, and evidence based practice will be explored in light of health care reform. The seminar will approach graduate education as means to prepare for life-long Christian service in God's world. This course is an elective in the Department of Nursing and will be offered once each academic year. Prerequisite: Junior status.

# Off-Campus Programs

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Calvin College provides semester-length programs for students who wish to study in the context of another culture or would benefit from a program that cannot be offered on campus. Calvin offers semester programs, directed by members of the Calvin faculty, in Britain, Hungary, China, Honduras (2), Ghana, Spain (2), France, Peru, and Washington D.C. Students may participate in non-Calvin programs as well. However, the level of Calvin financial aid varies by the program category. See below for details.

A student's eligibility and anticipated course credits are determined by a preliminary application that must be approved prior to application to a particular program. Calvin-sponsored programs require at least sophomore standing and a minimum grade point average (GPA) of 2.5. (Off-campus interims require at least sophomore standing and a minimum GPA of 2.0.) The requirements for admission to non-Calvin programs vary, as indicated in the program descriptions below.

Courses taught by Calvin instructors, or instructors hired by Calvin, will be given letter grades that calculate into the student's GPA. These courses will be specific registered courses, usually starting with 'ST' (e.g. STGH for the Semester in Ghana program). Courses taught at host universities will be treated as transfer credit (e.g. The Chicago Semester); these grades will be noted on the Calvin transcript, but will not calculate into the student's GPA.

Further information and preliminary application forms are available in the off-campus programs office or on the department website.

Students studying off-campus are required to carry a course load of at least 12 semester hours.

## CALVIN PROGRAMS

These programs have been developed by and are implemented through Calvin. Applicants should normally have completed at least one year of college studies with a minimum cumulative GPA of 2.5. Selection of participants is normally based on the appropriateness of the study to the applicant's college program, class level, GPA, interviews and recommendations.

### Semester in Britain (STBR)

The Semester in Britain takes place in York in partnership with York/St. John (YSJ) University each spring semester. York is located in central England approximately two hours from both London and Scotland. Students are housed at York/St. John University where they may take courses in a wide variety of disciplines. Students take two courses from the Calvin director and two courses at YSJ. The 2016 program director is M. Lundberg, of the Religion Department. The courses offered by the director in 2016 are as follows:

**210 Studies in British Culture (4).** A topical introduction to political, historical, religious, artistic, and popular aspects of the culture of Great Britain. The course engages the culture through a combination of classroom and experiential learning. Includes speakers, field

trips, excursions and tours. (Global Historical and Cross-cultural engagement core)

**225 History of British Theology (3).** (Theological Foundations core)

Students will choose two classes from York St. John University as well.

### Semester in China (STCH)

The Semester in China takes place each fall at Capital Normal University (CNU) in Beijing. The major focus of this semester is Chinese language and culture (in both traditional and modern China). Living and studying at Capital Normal University allows students to interact with Chinese and foreign students and visit important cultural and historical sites around Beijing. The program includes a one-week study tour to the ancient capitals and other important historical sites. No previous knowledge of Chinese is required. The language instructors are faculty members of CNU, and Chinese students serve as language tutors. The Calvin program director teaches three classes related to the history and culture of China. There are two possible tracks from which students can choose. The program director for fall 2016 is W. TenHarmsel.

There are two different tracks for this program:

### Language-Focus Track

209 **Exploring China** (1). Students study various aspects of China via participation in a series of field trips to important cultural and historical sites.

290 **Emerging China** (2). An examination of the development of China from the end of the Cultural Revolution to the present day, including China's place in the global economy, population growth, religion, and other social issues. (Cross-cultural engagement core)

390 **Chinese Language** (12). Level depends on placement examination at time of entrance.

### Language and Culture Track

210 **Traditional Chinese Civilization** (3). An introduction to Chinese civilization from its earliest times to the end of the Ming Dynasty, including its religious and philosophical underpinnings. (Global and historical studies core)

211 **Modern China** (3). A study of the history of China from the 17th century through the Revolution, with emphasis on its collision with the West in the 19th century. (Global and historical studies core)

290 **Emerging China** (2). An examination of the development of China from the end of the Cultural Revolution to the present day, including China's place in the global economy, population growth, religion, and other social issues. (Cross-cultural engagement core)

390 **Chinese Language** (8). Level depends on placement examination at time of entrance.

Students who have already taken History 245, 246, or 371 may, with the permission of the director of off-campus programs, substitute one course at the Beijing Center for either of the first two courses. Courses at the Beijing Center include art, literature, business, media, and government.

### Study in France (STFR)

The Semester in France takes place every other fall semester on the campus of Université Stendhal (Grenoble III). Students live with French families in Grenoble, in southeastern France. Student takes two classes from the Calvin director and then take additional courses on the campus of the organizational partner. The fall 2016 program director is V. DeVries of the French Department.

330 **Contemporary France** (3). An introduction to contemporary French culture through readings, discussions with guest speakers, and excursions. Begins late August with an orientation in Paris and Grenoble. Fulfills Cross-Cultural Engagement Core, as well as French minor and major requirements. (Cross-cultural engagement core, French elective)

362 **Francophone Literature and Culture in Su-Saharan Africa and Diaspora** (3). An introduction to representative writers and works of French expression from Sub-Saharan Africa and the African Diaspora. Conducted mainly in French. Prerequisite: French 301 or 302; French 351 recommended.

Students will enroll in courses from Centre universitaire d'études françaises that will grant credit for STFR 315 (Advanced Language Study in France; 3 semester hours), STFR 316 (Advanced Language Study in France II; 3 semester hours), and STFR 381 (Special Topics; 3 semester hours).

### Semester in Ghana (STGH)

The Semester in Ghana takes place each spring semester at the University of Ghana in Accra. Participants live in dorms on the campus of the University of Ghana and enroll in a wide range of classes offered by the Calvin director as well as direct-enrolled courses at the University of Ghana. These courses include:

211 **Introduction to African Studies** (3).

310 **Ghana Semester Practicum** (3). (Cross-cultural engagement core)

Courses offered by the staff of the Institute of African Studies:

100 **Twɔ Language** (2). An introductory course in the dominant local language, designed to help students communicate on a basic level with those around them. (Pass/fail, elective)

101 **African Drumming and Dance: Practice and Context** (1). Instruction in several traditional dances of the ethnic groups of Ghana, instruction in some patterns of traditional drumming, and lectures on the social and religious meaning of African dance, including its use in Christian worship. (Health and fitness core level II or III)

Required course taught through the University of Ghana:

**UGRC 220 Introduction to African Studies (3).** This is a University of Ghana Course offered by the Institute of African Studies. This course introduces students to the field of African Studies including African histories, peoples, and cultures. It begins with a general introduction to the discipline, its history and values; continues with an introduction to Gender Studies in Africa; and thereafter students select from an extensive and diverse menu of electives. While all students take the general introduction and the introduction of gender, students are registered into the elective that they will take in the second half of the semester (Global Historical Studies core).

Students will take at least one course at the University of Ghana.

### **Justice Studies in Honduras (STHO)**

The Semester in Honduras (Justice) takes place in Honduras every fall semester. Students live with Honduran families in Santa Lucia, a small community outside of Tegucigalpa. Students study on the campus of La Universidad Pedagógica. Disciplinary classes are taught consecutively by the program directors. Spanish language courses are taught throughout the semester by members of the faculty at the Universidad.

The academic components of the program are as follows:

**210 Encountering a Developing Society (3).** A study of the history, economics, and politics of Honduras as an example of a third-world country. (Global and Historical Studies core)

**211 The Problem of Poverty (3).** Analysis of development challenges encountered in Honduras, such as immigration to the North, maquiladoras, and urban overpopulation. See note under 212 regarding distribution credits.

**212 Development Theories in Practice (3).** Various perspectives on development practices from guests representing Christian and non-Christian development organizations. (The combination of 211 & 212 result in one sociology credit and one economics credit, and fulfills the Societal Structures core requirement.) May not be taken by students who have taken IDS 355.

**310 Honduras Semester Practicum (3).** Students will be placed in a Honduran organization (e.g., NGO or social service organization for a minimum of 80 hours) to gain hands-on experience related to the work of the organization. Through the practicum experience, students will gain a better understanding of the day-to-day work of practitioners. In addition, students will develop and implement a research project related to the organization, utilizing such skills as participative investigation, proposal writing, program evaluation, and report writing (Cross-Cultural Engagement core).

**Spanish Language Study (3-4).** Course choice depends on previous course work. See M. Rodriguez for more information.

### **Spanish Studies in Honduras (SPHO)**

The Semester in Honduras (Spanish) takes place in Honduras every interim and spring semester. Students live with Honduran families in Santa Lucia, a small community outside of Tegucigalpa. The emphasis of this semester program is for Spanish majors and minors. Students take two classes with the program director and the remaining courses are taken on the campus of La Universidad Pedagógica. The program director for spring 2016 is M. Rodriguez of the Spanish Department. The academic components of the program are as follows:

**205 Poverty and Development (3).** Analysis of development theories and major issues such as population, the environment, and globalization, as well as the role Christian values play in shaping responses to them. Includes several field trips. (Global and Historical Studies core).

**315 Engaging Honduran Culture (3).** A weekly seminar in which students compare and reflect on what they have learned from readings, interviews, and daily experiences. Includes speakers and excursions. This course is taught in Spanish by the Calvin director and is required of all students. (Cross-Cultural Engagement core)

**390 Direct Enrollment at the Universidad Pedagógica Francisco Morazán (3).** Direct enrollment in at least one course at the university is required of all students in this program, except those enrolled in SPAN 302. This course counts as elective credit toward the Spanish major or minor.

Additional courses:

**302 Advanced Grammar, Conversation, and Composition II** (3). A continuation of Spanish 301. Designed to improve speaking and writing skills through vocabulary acquisition, honing of grammatical accuracy, and extensive practice in oral and written communication.

**308 Introduction to the Hispanic World I** (4). This course introduces students to the major developments of the Hispanic World from antiquity to the independence of the American colonies in the early 19th century. Discussions center on the relationship of major literary and artistic works to economic, political, religious, and social developments in the Iberian Peninsula and the Castilian colonies in the Americas. This course, normally the first in a sequence of two, prepares students for advanced-level culture and literature courses. (Global and Historical Studies core)

**309 Introduction to the Hispanic World II** (4). This course introduces students to major developments of the Hispanic World from the independence of the Spanish American colonies to the present day. Discussions center on the relationship of major literary and artistic works to economic, political, religious, and social developments in Spain and Spanish America. In addition, students develop their skills in reading and evaluating literature in a second language through representative texts, and they sharpen their skills in critical writing and analysis. This course, normally the second course in a sequence of two, prepares students for advanced-level culture and literature courses. (Literature core)

**340 Spanish Phonology and Dialectology** (3). An introduction to Spanish linguistics, concentrating on the sounds of Spanish (phonetics and phonology), with appropriate pronunciation practice and contrasts with English pronunciation. Included are units on the history of the Spanish language and the major dialects spoken today.

**364 Central American Authors** (3). An in-depth study of major Central American authors and works. The course requires the reading of several complete texts and the writing of a major research paper. Prerequisites: Spanish 308 and 309, or permission of the program director.

**393 Independent Ethnographic Study** (2). Placement in a local agency, school, or business to observe and/or participate in a work setting. Prerequisite: permission of the program director.

### Semester in Hungary (STHU)

The Semester in Hungary takes place in Budapest, Hungary every fall semester. Students live in dorms of Karoli Gaspar Reformed University and take up to two direct-enrolled classes in English at either Karoli Gaspar University or Corvinus University. In addition, students take several classes from the Calvin director as well as Hungarian instructors hired directly by Calvin College. The fall 2016 program director is M. Walhout of the Physics Department.

Required courses:

**100 Introduction to the Hungarian Language** (2). An introduction to the Hungarian language. (Pass/fail)

**200 A River Runs Through it: Science, Technology and Society in a Multinational River Basin** (3-4). The Danube is the most international river basin in the world. This course will examine several ways in which the cultures and politics of the region have been shaped by the geographic features, physical resources, and technological developments connected to the river. Introductory scientific concepts will be developed at a “science for citizenship” level and used to analyze the material roots of commercial, environmental, and national security interests. (Lab available, combined with course for 4 hours will meet physical world core.)

**210 Studies in Central European Culture** (3). A topical presentation of East Central Europe—politics, religion, art, music and science—through guest speakers, readings, and excursions. (Global Historical Studies core.)

**312 Studies in Central European Culture** (3). A topical presentation of East Central Europe—politics, religion, art, music, and science—through guest speakers, readings and study trips. (Global and Historical Studies core)

**290 Cross Cultural Engagement/Practicum** (0 or 1).

Optional course:

**235 Italian Renaissance Art** (3).

### Study in Peru (STPE)

Participants study on the campus of the Universidad Católica San Pablo in Arequipa, Peru from mid-August through the fall semester. They enroll in both Calvin and San Pablo courses, live individually with local families, and participate in educational excursions and optional extracurricular activities. The program director is D. Zandstra.

#### Required courses

**315 Engaging Peruvian Culture (3).** An on-site seminar that provides orientation to Peruvian, Arequipan, and university culture and introduces students to cross-cultural issues. Students discuss and reflect on what they learn from readings, interviews, and daily experiences. Includes speakers and excursions. (Cross-Cultural Engagement core)

**390 Direct Enrollment at the UCSP (3).** Direct enrollment in at least one course at the university is required of all students in this program, except those enrolled in Spanish 302. This course counts as elective credit toward the Spanish major or minor.

#### Additional courses

**302 Advanced Grammar, Composition, and Conversation II (3).** A continuation of Spanish 301. Designed to improve speaking and writing skills through vocabulary acquisition and the honing of grammatical accuracy. Extensive practice in oral and written communication.

**308 Introduction to the Hispanic World I (4).** This course introduces students to major developments of the Hispanic World from antiquity to the independence of the Spanish American colonies in the early 19th century. Discussions center on the relationship of major literary and artistic works to economic, political, religious, and social developments in the Iberian Peninsula and the Castilian colonies in the Americas. This course, the first in a sequence of two, prepares students for advanced-level culture and literature courses. (Global and Historical Studies core)

**309 Introduction to the Hispanic World II (4).** This course introduces students to major developments of the Hispanic World from the independence of the Spanish American colonies to the present day. Discussions center on the relationship of major literary

and artistic works to economic, political, religious, and social developments in Spain and Spanish America. In addition, students develop their skills in reading and evaluating literature in a second language through representative texts, and they sharpen their skills in critical writing and analysis. This course, the second in a sequence of two, prepares students for advanced-level culture and literature courses. (Literature core)

**340 Spanish Phonology and Dialectology (3).** An introduction to Spanish linguistics, concentrating on the sounds of Spanish (phonetics and phonology), with appropriate pronunciation practice and contrasts with English pronunciation. Included are units on the history of the Spanish language and the major dialects spoken today.

**370 Analisis de la Realidad Peruana (3).** A consideration of the emergence of Peruvian nationhood and identity within a global context, focusing on historical, ecological, and social issues, the legacy of pre-Columbian civilizations, and contemporary challenges.

### Study in Spain (STSP)

Calvin has two semester programs in Oviedo, Spain. Students in both programs live individually with Spanish families, participate in educational excursions, and attend classes on the campus of the University of Oviedo.

The fall program (odd years only) serves two groups: students desiring to fulfill the college foreign language core requirement and/or advanced students pursuing a Spanish major or minor who desire a full academic year abroad. Students in the fall program have the option of enrolling in university courses taught in English. The program director for fall 2016 is O. Shkatulo.

The interim-spring program (every year) serves advanced students pursuing a Spanish major or minor. In this program students take 15–20 semester hours toward their Spanish concentration. Prerequisite: Spanish 301. The director for this program is E. Miller.

Students in both programs will enroll in at least one language course at La Casa de Lenguas in Oviedo.

#### Courses Offered only in Fall Program

**Spanish Language Study (3).** Course choice depends on previous course work.

**215 Engaging Spanish Culture (3).** This course is designed to allow students to gain skills in cross-cultural communication; to understand how the world might look from the standpoint of Spanish experience; to learn how to discern and, where appropriate, adapt to Spanish cultural expectations of the other; to learn how to distinguish between the enduring principles of human morality and their Spanish-specific adaptations; to witness Spanish cultural embodiments of faith, and thus to reflect on the substance and definition of one's own faith by comparison. This course is taught in English by the Calvin director and is required of all students.

**Courses Offered only in Interim-Spring Program:**

**315 Engaging Spanish Culture (3).** This course is designed to allow students to gain skills in cross-cultural communication; to understand how the world might look from the standpoint of Spanish experience; to learn how to discern and, where appropriate, adapt to Spanish cultural expectations of the other; to learn how to distinguish between the enduring principles of human morality and their Spanish-specific adaptations; to witness Spanish cultural embodiments of faith, and thus to reflect on the substance and definition of one's own faith by comparison. This course is taught in Spanish by the Calvin director and is required of all students.

**308 Introduction to the Hispanic World I (4).** This course introduces students to major developments of the Hispanic World from antiquity to the independence of the Spanish American colonies in the early 19th century. Discussions center on the relationship of major literary and artistic works to economic, political, religious, and social developments in the Iberian Peninsula and the Castilian colonies in the Americas. This course, normally the first in a sequence of two, prepares students for advanced-level culture and literature courses. (Global and Historical Studies core)

**309 Introduction to the Hispanic World II (4).** This course introduces students to major developments of the Hispanic World from the independence of the Spanish American colonies to the present day. Discussions center on

the relationship of major literary and artistic works to economic, political, religious, and social developments in Spain and Spanish America. In addition, students develop their skills in reading and evaluating literature in a second language through representative texts, and they sharpen their skills in critical writing and analysis. This course, normally the second course in a sequence of two, prepares students for advanced-level culture and literature courses. (Literature core)

**390 Direct Enrollment at the Universidad de Oviedo (3).** Direct enrollment in at least one course at the university is required of all students in this program, except those needing SPAN 302. This course counts as elective credit toward the Spanish major or minor.

**393 Independent Ethnographic Study (2).** Placement in a local agency, school, or business to observe and/or participate in a work setting. Prerequisite: permission of the program director.

**Semester in Washington, D.C. (STDC)**

The Henry Semester in Washington DC is offered each spring and offers students from a wide range of majors the opportunity to combine an internship in their major or minor with academic study in order to better understand the workings of the nation's capital. Students are required to enroll in POLS 241, a one hour preparatory course offered in the fall semester prior to going to DC. The program director for 2016 is M. Pelz of the Political Science Department. Classes include the following:

**342 Citizenship in an age of cynicism: How to be political without being a jerk (3).** This special topics course will chronicle the sources of political cynicism in contemporary American politics including political polarization, voter apathy, campaign contributions and advertisements, and political brinkmanship. It will then introduce and explore a range of different perspectives with the capacity to transcend these contemporary dilemmas. This discussion will include the works of Abraham Kuyper, Paul Henry, Diana Mutz, and Reinhold Niebuhr among others. Students in this course will submit discussion questions for each class session as well as write several reflection papers that apply course materials to their own political

practices, internship experiences, and political developments from inside the beltway.

**343 Integrating Faith and Public Life (3).** This course will focus on the role of religion in the public life of Washington, DC. Specifically, the course will examine how religious individuals and institutions of many faith traditions seek to affect the climate and content of policy making. The course will stress site visits to organizations that influence, study, and/or implement public policies in a variety of areas such as health, social services, security, economic development, and trade. Students will be challenged to compare and contrast the organizations where they work as interns with the institutions visited in this course, particularly in terms of organizational objectives and the role of religion in the organization's mission. May be credited as an elective or as a departmental credit when accepted by individual departments.

**344 Internship in Washington, D.C. (8).** An internship experience, normally consisting of a four-day work week in a professional setting, in the student's major field of concentration. Credit toward a departmental major is granted at the discretion of each department.

Internships for social work students are available to students approved by the Sociology and Social Work Department. See P. DeJong, Sociology and Social Work Department, for further information.

### NON-CALVIN PROGRAMS

Beyond offering a wide variety of its own off-campus programs, Calvin also supports students who find other programs that they think better meet their needs. This support includes both administrative and financial support (e.g. Calvin financial aid). The amount of Calvin financial support (e.g. department scholarships, Knollcrest grant, etc) varies, depending on the program chosen. Financial aid funded by sources outside of Calvin will not change if a student attends a non-Calvin program. Non-Calvin programs are grouped into the following categories: Calvin Partnered programs, Calvin Exchange programs, Calvin Supported programs, and Independent Studies.

All students who are planning to study off-campus for any semester program must complete a preliminary application form through the Off-Campus Programs Office.

In terms of GPA calculations, all credits on non-Calvin semester programs are treated as transfer credits; the grades, although recorded, are not calculated in the student's GPA (with the exception of the Chicago Semester). However, grades must be at least a C for credit to be granted.

### CALVIN PARTNERED PROGRAMS

These programs are offered through organizations that partner with Calvin, and they have been identified for students to fulfill specific requirements in certain majors. 100% of Calvin-funded financial aid will be applied, meaning that full financial aid is granted for these partner programs. It is important to note that the cost of some semester program may exceed the cost of attending Calvin. Calvin Partnered Programs are:

**Au Sable Institute of Environmental Studies.** As one of several sustaining partners, Calvin offers undergraduate off-campus environmental science courses (ASI) through the Au Sable Institute during January (Interim) and the summer. More information is available on the Au Sable website. Questions should be directed to Calvin's faculty representative to Au Sable, Dr. Dave Warners.

**Central College in Vienna: German language study in Austria.** Experience two countries, Germany and Austria, in one program. First an intensive German-language program at the Goethe Institute in Germany followed by continued language and culture study in Vienna.

**Chicago Semester.** Open to all majors, The Chicago Semester (CSP) is sponsored by Calvin together with Central, Dordt, Hope, Northwestern and Trinity Colleges and is administered by Trinity Christian College. It offers qualified juniors and seniors the opportunity to gain a semester's credit through studying and working in Chicago. Students participate in seminars at the Chicago Semester's Loop Center and spend four days a week in an internship related to their career interest and academic major. Students not in a special track (education, nursing or social work) take two seminars in addition to their internship.

**Field Internship (9).** F. S. Students enrolled in the Chicago Semester program have a large number of placements available to them. Students may select internships from a range of organizations, which include banks, businesses,



hospitals, media, mental health clinics, churches, social agencies, public services, and civic institutions. The student interns are supervised on the job by Chicago semester staff members.

#### **Japan Center for Michigan Universities.**

Students may choose to spend fall semester, spring semester, or summer semester at the Japan Center for Michigan Universities in Hikone, near Kyoto. Courses are offered in both Japanese language and Japanese culture. In addition, students take two other courses related to Japan. The course offerings vary each semester, but include topics such as Japanese Economic Practices, Environmental Issues in Japan, and Japanese International Relations. Students may either live in the dormitory or stay with a Japanese family for the entire semester, or live in the dorm but stay with a Japanese family on some weekends. See L. Herzberg, Germanic and Asian Languages Department, for further details.

#### **CALVIN EXCHANGE PROGRAMS**

Calvin has also established a number of exchange programs with other institutions. These programs have been set to allow equal number of students to be exchanged between two institutions. As one Calvin student goes to an overseas institution, a student from this institution attends Calvin. Exchanges have often been set up for students in specific majors. Students pay Calvin tuition (to Calvin) and are also responsible for other costs such as room and board, transportation, and immunizations). Current exchange programs exist for the following institutions:

Hogeschool, Zeeland in Vissingen, the Netherlands (for business/economics majors)

Handong University in Pohang, Korea. Open to all majors.

#### **CALVIN SUPPORTED PROGRAMS**

Calvin recognizes the wide variety of quality programs that are offered by other organizations throughout the world that might fit better with a student's interests and major/minor. While Calvin cannot support an unlimited number of students studying in these programs, students can apply for and receive a "slot" that allows them to take 50% of their Calvin financial aid along with 100% of financial aid funded by sources outside of Calvin to help finance their participation in these programs.

Although the number of slots may vary from year to year, typically there are between 10 to 20 slots offered each year. An application for one of these slots can be picked up from the Off-Campus Programs Office; deadlines for submitting these applications is late Spring for the entire upcoming academic year.

#### **INDEPENDENT STUDIES**

If a student's application for a Calvin supported slot is not selected, they are still welcome to participate in that program. Although Calvin funded financial aid will not be available, 100% of financial aid from sources outside of Calvin would apply to the program. The student would be responsible for paying Calvin tuition as well as any additional program costs. The Off-Campus Programs office has brochures and other materials available for browsing by students interested in exploring this option. Credit for these programs will be considered as transfer credit.

# Philosophy

Professors K. Corcoran, R. De Young, R. Groenhout (chair), L. Hardy, †D. Hoekema,  
G. Mellema, J. Smith, , \*C. Van Dyke, †S. Wykstra

Associate Professors M. Halteman

Assistant Professor D. Billings

The department offers a major concentration appropriate for pursuing philosophy at the graduate level and also for careers in various professions including higher education, law, the ministry, information technology, and government service. The core course in philosophy provides an essential foundation for Christian liberal arts education. Intermediate-level courses in a wide range of areas offer all students regardless of their field of study the opportunity for further exploration of basic issues of morality, science, gender, law, health care, and politics.

## PHILOSOPHY MAJOR

(33 semester hours)

Philosophy 153

Philosophy 171 or 273

Philosophy 205

Philosophy 204 or 283

Philosophy 251

Philosophy 252

Philosophy 340 or 341

One 300-level historical course. Philosophy 312-336, 396 can fill this requirement

One 200-level systematic. Philosophy 201-226 or a 300-level with permission

One 300-level systematic. Philosophy 318, 365-390, 395 can fill this requirement

Philosophy 395 or 396

## PHILOSOPHY DOUBLE MAJOR

(27 semester hours)

Philosophy 153

Philosophy 171 or 273

Philosophy 205

Philosophy 251

Philosophy 252

Philosophy 340 or 341

One 200-level systematic: Philosophy 201-226 or a 300-level with permission

One 300-level systematic: Philosophy 318, 365-390, or 395

One philosophy elective

## PHILOSOPHY MINOR

(18 semester hours)

Philosophy 153

Philosophy 171 or 273

Philosophy 251

Philosophy 252

Two 200/300-level electives

## Honors

Students wishing to graduate with honors in philosophy must complete six honors courses overall, including two philosophy honors courses with a grade of B or higher, at least one at the 300-level. They must achieve a minimum cumulative GPA of 3.3 and a minimum GPA in the philosophy major of 3.0, and they must successfully submit and present an honors paper.

## COURSES (PHIL)

### Elementary Courses

**153 Fundamental Questions in Philosophy** (3). F, S. An introduction to fundamental questions about God, the world, and human life and how we know about them. These questions are addressed through the study of historically significant texts, primarily from the Western philosophical tradition. An emphasis is placed on philosophical reflection and discussion, constructing and evaluating arguments, reading and interpreting philosophical texts, writing clear expository prose, and engaging in faith-oriented and faith based inquiry. The course aims to help students use philosophy to respond to central issues in human life and in contemporary society.

**171 Introduction to Logic** (3). S. A course in elementary deductive and inductive logic with emphasis upon the use of logic in evaluating arguments. Suitable for first-year students, not recommended for students aiming toward graduate study of philosophy.

**273 Symbolic Logic** (3). F. A course in elementary symbolic logic, including some modal logic. This course is recommended es-

pecially for those intending to study philosophy at the graduate level. Open to qualified first-year students.

### **Intermediate Systematic Courses**

*All intermediate courses presuppose completion of Philosophy 153.*

*Students may take Philosophy 201-205, 207, 208, 212, 215 for core credit in integrative studies.*

*Students may take Philosophy 211 to fulfill Persons in Community core requirement.*

*Students may take Philosophy 225 or 226 for core credit in cross cultural engagement.*

**201 Philosophy of Social Science (3).** A study of the philosophical questions raised by methods, assumptions, and results of the human sciences, such as cultural relativism, social determinism, scientific objectivity, and religious neutrality. Attention will also be given to relationships between theology, philosophy, and social science. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: Two courses in the Social Sciences. Not offered 2015–2016.

**202 Law, Politics, and Legal Practice (3).** F. An investigation of such topics as the nature and types of law, sources of law, the bases of a legal system, the nature of legal and political authority, and the status of civil and human rights. Some consideration will also be given to the complex role lawyers and judges play in our society and to some of the ethical issues they may face as a result of this complexity, as well as to the ways in which a Christian perspective might affect the decisions a lawyer, judge, or citizen makes about the law and legal practice. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in the social sciences.

**203 Understanding Natural Science: Its Nature, Status, and Limits (3).** An investigation of the nature of science (its structure, methods, and status), and its place in human life, by looking at the historical de-

velopment of science, including its interactions with other human activities, especially religion. The course will encourage students to develop their own views on major issues regarding the nature of science and its appropriate relations to worldviews and faith. It will use history of science both to place these issues in context and to test rival pictures of what science is, how it works, and how it has been—and should be—related to Christian faith. Special emphasis will be given to the diverse ways these issues have been approached within the Reformed tradition. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in the natural sciences. Not offered 2015–2016.

**204 God and Philosophy (3).** S. A sustained philosophical reflection on the nature and existence of God, addressing such questions as the rationality of belief in God, the role of evidence in religious belief, the problem of evil, the suffering of God, the point of prayer, the use of gendered language about God, the fate of sincere believers in non-Christian religions, and the existence of hell. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in religion.

**205 Ethics (3).** S. This course reflects on the moral dimension of life as a whole, in its relation to what we believe, what we do, and what sorts of people we want to be. It studies basic ethical questions such as the objectivity of right and wrong, what justice is, how we ought to live, why we should try to be morally good. It considers these questions both theoretically and practically (by applying them to issues in contemporary social life, such as capital punishment or abortion). It also uses both historical sources (such as Aristotle and Kant) and contemporary sources. Finally, it considers what difference Christian faith makes to the theory and the practice of morality. There may be a service-learning component in the course, depending on the instructor. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in philosophy and/or religion.

**207 Justice and the Common Good: Studies in Political Philosophy** (3). A study of the historical sources and philosophical dimensions of the major debates in contemporary political thought, including an analysis of the basic terms of current political discourse—such as freedom, justice, rights, and equality—and an assessment of their role in the debates over such issues as racism, gender relations, multiculturalism, and religion in the public square. The course also explores traditions of Christian reflection on the purpose of the state, the limits of legislation, the nature of community, the requirements of justice, and the calling of the Christian citizen. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in Social Sciences. Not offered 2015–2016.

**208 Philosophy of the Arts and Culture** (3). F A study of the nature of the arts and their role in human cultures. The course discusses the history of philosophical reflections on these topics as well as some recent theories and debates. It aims to develop a mature understanding of issues and challenges facing participants in contemporary arts and culture. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in the arts or two courses in literature.

**211 Philosophy of Gender** (3). F, S. In this course students are offered the opportunity to gain a historically-grounded philosophical understanding of the concept of gender, to understand the ways in which gender concepts are formed by, and in their turn, form contemporary cultural beliefs and practices, and to consider how these issues intersect with a Reformed understanding of human life.

**212 Ethical Dimensions of Health Care** (3). S. A study of ethical issues that arise in the context of contemporary health care and related practices. Ethical issues such as abortion, euthanasia, informed consent, and health care allocation will be examined from a perspective afforded by current philosophical debates in ethical theory.

**215 Business Ethics** (3). A systematic examination of ethical concepts as they relate to business conduct, designed to be of inter-

est to all students who are concerned about justice and fairness in the marketplace. Issues such as discrimination and affirmative action, the ethics of advertising, protection of the environment, responsibilities of employees to the firm and of the firm to employees, and the rights of other stakeholder groups will be examined in the light of current debates in ethical theory. Students taking this course to fulfill the integrative studies requirement of the core must have the following prerequisites in addition to Philosophy 153: two courses in business/economics. Not offered 2015–2016.

**225 Chinese Thought and Culture** (3). F A study of the relationships among Chinese philosophy, art, social life, and society, examining the expressions of Chinese thought in the writings of Confucius, Laozi, Zhuangzi, and Mencius. The course also correlates Chinese thought with other aspects of Chinese culture, such as tai chi, religious practice, cuisine, calligraphy, poetry, film, painting, and family organization. This course fulfills the global and historical and the CCE requirements of the core.

**226 African Thought and Culture** (3). Philosophies and worldviews of Africa, including traditional cosmologies and moral systems, philosophical responses to the legacy of transatlantic slavery, and political ideologies of the era of African independence. The role of Christianity in African thought, and the issue of race and African identity are also examined. Sources include selected writings of philosophers and other scholars, literature, art and music, and collaborative activities with Africans residing in West Michigan. This course fulfills the global and historical and the CCE requirements of the core. Not offered 2015–2016.

**283 Metaphysics** (3). F A study of selected topics in metaphysics.

### Intermediate Historical Courses

*All intermediate courses presuppose completion of Philosophy 153.*

**251 History of Western Philosophy I** (3). F, S. A survey of the major Western philosophers and philosophical movements of the ancient and medieval periods. Prerequisite: Philosophy 153.

**252 History of Western Philosophy II** (3). S. A survey of some of the major Western

philosophers and philosophical movements from the seventeenth century to the end of the nineteenth century. A continuation of Philosophy 251, which is a recommended preparation. Prerequisite: Philosophy 153.

### Advanced Historical Courses

*All advanced courses presuppose two or more philosophy courses, or one philosophy course plus junior or senior standing.*

312 **Plato and Aristotle** (3). S. Advanced study of Plato and Aristotle. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing.

322 **Aquinas** (3). An intensive study of selected texts of Thomas Aquinas. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016.

331 **Kant** (3). A study of the Critique of Pure Reason. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016

333 **Kierkegaard** (3). F. A study of selected philosophical works of Kierkegaard, focusing primarily on his philosophy of religion. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing.

334 **Marx and Marxism** (3). A critical study of the thought of Karl Marx and his most important interpreters. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016.

336 **Studies in Modern Philosophy** (3). A study of major European thinkers of the seventeenth and eighteenth centuries. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016.

340 **Contemporary Continental Philosophy** (3). F. An in-depth study of major European figures in postmodern thought such as Nietzsche, Heidegger, Foucault, Levinas, and Derrida. Prerequisite: Philosophy 252.

341 **Contemporary Anglo-American Philosophy** (3). S. An in-depth study of some of the major figures and schools of twentieth-century

Anglo-American philosophy, beginning with the birth of analytic philosophy in the works of Bertrand Russell, G.E. Moore, and Ludwig Wittgenstein. Prerequisite: Philosophy 252.

### Advanced Systematic Courses

318 **Minds, Brains, and Persons** (3). S. An introduction to contemporary analytic philosophy of mind. Central issues in the philosophy of mind include such topics as the relation between mental states and the brain, the nature of consciousness, questions related to the kind of thing human persons are, including careful consideration of contemporary defenses of dualism and problems related to personal identity. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing.

365 **Ethical Theory** (3). F. An advanced study of central debates in contemporary moral theory. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing.

371 **Epistemology** (3). A study of problems in theory of knowledge, with special attention to how recent controversies about evidence and knowledge shed light on perplexities about the status of faith, religious belief, and knowledge of God. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016

375 **Philosophical Anthropology** (3). A critical examination of major philosophical discussion of the nature of human existence, with special attention to selected topics such as gender, culture, society, mind, and body. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016.

378 **Philosophy of Language and Interpretation** (3). A study of the nature and sources of language, and of the most prominent theories and methods of interpretation. Special attention will be given to 20th century figures in analytic philosophy, hermeneutics, and literary theory. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016

381 **Advanced Logic** (3). Topics include the formalization of propositional and quantificational logic, alethic modal logic including se-

semantic interpretations, various other modalities, alternative logics, and other formalisms of philosophical importance. Prerequisite: Two or more philosophy courses, or one philosophy course plus junior or senior standing. Not offered 2015–2016.

390 **A Readings and Research.** F, I, and S. Prerequisite: permission of the chair.

395 **Philosophy Topics: Problems in Systematic Philosophy** (3). F An advanced seminar on selected problems in systematic philosophy,

involving seminar presentations and the preparation of a major research paper. Prerequisite: Three upper level courses in philosophy and senior standing or permission of the chair.

396 **Philosophy Topics: Figures and Themes in the History of Philosophy** (3). S. An advanced seminar on selected figures or themes in the history of philosophy, involving seminar presentations and the preparation of a major research paper. Prerequisite: Three upper level courses in philosophy and senior standing or permission of the chair.

## Physical Education and Recreation

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See the Department of Kinesiology for descriptions of course offerings.

## Physics

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Professors S. Haan, \*\*J. Jadrich, L. Molnar, M. Walhout (chair)

Associate Professors L. Haarsma, P. Harper

Assistant Professors R. Balili, J. Smolinski

The Physics and Astronomy Department offers programs of concentration for students interested in careers or graduate studies in physics, astrophysics, or related disciplines, and for students interested in high school physics teaching. Students intending to major in physics are advised to enter college with four years of mathematics and to complete their 100 and 200-level courses in mathematics and physics during their first and second years.

The physical world core requirement may be met by Physics 132, 133, 212, 221, or 223. The entire science core requirement (both physical world and living world) may be met by the two-course sequences of Physics 132/133 or 133/235.

### PHYSICS MAJOR

(At least 32 semester hours)

Physics 132

Physics 133

Physics 235

Physics 237

Physics 246

Physics 306 (or higher level substitutes)

Two or more advanced theory courses from Physics 335, 345, 346, 365, 375, or 376

Two or more advanced laboratory courses from Physics 339, 349, or 379, Astronomy 384, or Engineering 204

Departmentally approved electives to bring the total to at least 32 hours

Physics majors must enroll in at least four semesters of Physics 195; junior and senior physics majors are expected to give presentations in this course.

### Cognates

(At least 13 semester hours)

One from Computer Science 104, 106, or 108 (106 recommended)

Mathematics 170 or 171

Mathematics 172

Mathematics 270 or 271 (271 recommended)

Mathematics 231 is also recommended

The 32-hour major is intended primarily for students seeking a flexible program,

e.g., those who are also majoring in another discipline or earning an engineering degree but have an active interest in physics. The major satisfies the college's concentration requirement for graduation with a BA degree.

Students wanting a BS degree must complete a total of at least 58 semester hours of science and mathematics. Students interested in a physics-related career who want to earn a BS degree based on a physics major should complete the above minimum requirements, including Mathematics 231, plus at least one additional 300-level physics theory course. Additional courses in mathematics and computer science are also recommended.

Students planning to pursue graduate study in physics should take all of the physics theory and laboratory courses listed above, all of the mathematics and computer science cognates listed above, and Mathematics 333, Mathematics 331, 343, 355, and 365 are recommended. Students are also strongly encouraged to participate in summer research.

Students interested in astronomy or astrophysics careers should major in physics, minor in astronomy, and plan their programs with L. Molnar.

### **PHYSICS MINOR**

(At least 20 semester hours)

Physics 132

Physics 133

Physics 195

Physics 235

Physics 237

Physics 246

Physics 306

Higher level physics courses may be substituted with the approval of the department.

### **SECONDARY EDUCATION**

#### **PHYSICS MAJOR**

(At least 30 semester hours)

Same as the standard BA physics major, with the following exceptions:

The two required advanced theory courses must be Physics 335 and 345.

Only one advanced laboratory course is required.

#### **Cognates**

(At least 19 semester hours)

Mathematics 171 (or 170), 172, and 271 (or 270)

Science Education Studies 214, 314, and 359

### **SECONDARY EDUCATION**

#### **PHYSICS MINOR**

The secondary education physics minor is the same as the standard physics minor. Science Education Studies 214 and 314 are required cognates.

#### **ELEMENTARY AND SECONDARY INTEGRATED SCIENCE STUDIES MINOR AND MAJOR**

Students in the elementary or secondary education program wishing to major or minor in science should consult the Science Education Studies section of the catalog.

#### **OPTICS MINOR**

(At least 19 semester hours)

Physics 132 or 133

Physics 235

Physics 246

Physics 345 or Engineering 302

Physics 346

Physics 349 or 379

Students pursuing a physics major and optics minor must follow college guidelines for overlap between a major and a minor; this is facilitated by the option in the physics major of substituting upper-level courses for introductory ones.

#### **PHYSICS/COMPUTER SCIENCE GROUP MAJOR**

(At least 38 semester hours)

Physics 132

Physics 133

Physics 235

Engineering 204

Computer Science 106 or 108 (106 recommended)

Computer Science 112

Computer Science 214

One from Computer Science 212, Engineering 220, or an upper division computer-science elective

Physics or computer science electives (to provide a minimum of 24 semester hours in either physics or computer science)

Cognates

(At least 16 semester hours)

Mathematics 170 or 171

Mathematics 172

Mathematics 231 or 256

Mathematics 270 or 271

## Honors

The requirements for graduation with honors in physics are:

1. Minimum cumulative GPA of 3.5 and total of six honors courses (18 hours minimum) overall, including two honors courses outside the major,
2. At least three honors courses (of 3 or more semester hours each) in physics or astronomy, at least one of the three must be an advanced theory course from 335-376, excluding 347,
3. Cumulative GPA of at least 3.3 in physics, astronomy, and mathematics collectively,
4. Completion of an approved physics major, with at least 40 semester hours of physics or the secondary education physics major (Astronomy 384 and Astronomy 395 may be counted in the 40 hours), and
5. Successful completion of a departmentally approved research project in physics or astronomy (typically through summer research) and Physics or Astronomy 395.

To obtain honors credit in any physics or astronomy course, a student can make a contract with the course instructor regarding a special project. Alternatively, a student in an Introductory level physics course up through Physics 235 or in a 100 - 200-level astronomy course may earn honors in that course by concurrently taking the seminar course, Physics 195, and completing its requirements. A student must earn a grade of "B" or better in a course to receive honors designation for that course.

## COURSES (PHYS)

### Introductory Courses

**132 Matter, Light, and Energy** (4). F This course provides an introduction to physical interactions involving matter, light, and energy. Topics include: observational astronomy; the atomic model of matter and the behavior of solids, liquids, and gases; temperature, heat, and thermodynamics; waves and sound; geometric optics and the wave-particle duality of light; atomic nuclei, nuclear reactions, and radiation; quarks and the Standard Model of particle physics. This course also surveys key historical developments in physics

as well as foundational scientific methods and assumptions. Laboratory. Prerequisite: High school physics and completion of (or concurrent registration in) a calculus course, or permission of the instructor.

**133 Introductory Physics: Mechanics and Gravity** (4). S. An introduction to classical Newtonian mechanics applied to linear and rotational motion, a study of energy and momentum and their associated conservation laws, introductions to oscillations and to gravitation. Attention is given throughout to the assumptions and methodologies of the physical sciences. Laboratory. Prerequisites: normally, concurrent registration in Mathematics 172. Students taking Mathematics 169 or 171 may enroll with permission of the instructor.

**195 Physics and Astronomy Student Seminar** (0). F, S. This course gives students a broad overview of the fields of physics and astronomy through guest lectures, presentations by Calvin students and professors, group discussions, and other activities. A student may earn honors credit in an approved introductory physics course by completing a paper and, at the instructor's option, a class presentation on an approved topic. This course may be taken multiple times.

**212 Inquiry-Based Physics** (4). F. This course provides a hands-on study of important concepts in physics. The course is designed specifically to meet the needs of teacher-education students who wish to be elementary- or middle-school science specialists, but is open to other students who satisfy the prerequisites. Topics covered include mechanics (energy, force, friction, work, torque, momentum, and simple machines), pressure, waves, sound, light, resonance, electricity, magnetism, and radioactivity. Reflections on the nature of physical science and the physical world are included, connections to everyday experience and to technology are discussed. Prerequisite: Science Education Studies 121 or high-school physics.

**221 General Physics** (4). F. This course is designed for those who do not intend to do further work in physics. Topics covered in the two-semester sequence (Physics 221-222) include Newtonian mechanics, fluids, waves, thermodynamics, electricity, magnetism, light, optics, atomic physics, and nucle-



ar radiation. Attention is given throughout to quantitative analysis, empirical methods, experimental uncertainties, perspectives on the assumptions and methodologies of the physical sciences, and the use of physics in the life sciences. Laboratory. Prerequisites: high-school algebra and trigonometry.

**222 General Physics (4).** S. A continuation of Physics 221, which is a prerequisite. Laboratory.

**223 Physics for the Health Sciences (4).** S. An introduction to those topics in physics that are applicable to a variety of health science fields, with special emphasis on understanding various physical aspects of the human body. Topics include basic laboratory techniques and instruments for physical measurements, data analysis, basic mechanics, fluids, heat, electrical circuits, sound, optics, radioactivity and x-rays, a discussion of the nature of physical science, and a Christian approach to science. Laboratory integrated with lecture. Prerequisites: High school geometry and algebra. Not open to those who have taken or plan to take Physics 221.

**235 Introductory Physics: Electricity and Magnetism (4).** F. A study of electric and magnetic forces, fields, and energy, and of the integral form of Maxwell's equations, which describe these fields, electric circuits. Laboratory. Prerequisites: Physics 133 and at least concurrent registration in Math 270 or 271.

**237 Einstein's Theory of Relativity (1).** S. This course focuses on the principles and predictions of Einstein's special theory of relativity. Topics include: invariance of the speed of light and physical laws, length contraction and time dilation, relativistic momentum, mass-energy equivalence, and Lorentz transformations. Ideas from the general theory of relativity may also be introduced. Prerequisite: Physics 133 or Physics 221 or their A.P. equivalents.

**246 Waves, Optics, and Optical Technology (3).** S, alternate years. This course offers a combination of theoretical and experimental investigations into light and its interaction with matter. The electromagnetic-wave model and the photon model are developed and applied in the context of optical materials and instruments. Coverage includes assorted topics relating to lasers and other light sources, detectors, spectrometers, interferometers,

thin films, gratings, polarizers, phase retarders, fiber optics, nonlinear crystals, and electro-optical technologies. Laboratory integrated with lecture. Prerequisites: Physics 235 or Physics 222 and Mathematics 172. Computer Science 106 is recommended.

**295 Seminar in Physics, Technology and Society (0).** F and S. This course gives students a broad overview of the fields of physics and astronomy through guest lectures by active researchers, focused readings and discussions of Science, Technology, and Society issues, and student presentations. Each student is required to make a presentation on an approved topic. Meets concurrently with physics 195. Prerequisite: Physics 235 and at least one semester of Physics 195. This course may be taken multiple times. Concurrent enrollment in 296 is not allowed.

**296 Studies in Physics, Technology and Society (1).** F; S. This course is identical to Physics 195, except that each student must pursue an instructor-approved project that will produce an in-depth paper as well as an oral presentation. Not open to first-year students. This course may be taken multiple times.

### Advanced Theory Courses

**306 Introduction to Quantum Physics (4).** S, alternate years. This course introduces non-classical phenomena and their explanation in quantum mechanics. Topics include wave-particle duality of matter and light, the Heisenberg uncertainty principle, Schrodinger's wave mechanics, spin, quantum mechanical treatment of atoms, the quantum mechanical description of solids, introduction to nuclear physics, radioactivity, strong and weak nuclear force, and elementary particles. Prerequisites: Physics 235 and Mathematics 270 or 271. Computer Science 106 is recommended. Not offered 2015–2016.

**335 Classical Mechanics (4).** F, alternate years. Theory and applications of the Newtonian framework, covering systems of particles, conservation laws, the harmonic oscillator, central forces, orbital motion, motion in non-inertial reference frames, rotations of rigid objects, coupled oscillators and normal modes, the principle of least action, and Lagrangian and Hamiltonian mechanics. The status of Newtonian determinism and the question of predictability

are also addressed. Alternate years. Prerequisites: Mathematics 172 and at least concurrent enrollment in Physics 235. Mathematics 270 or 271 and Computer Science 106 are recommended. Not offered 2015–2016.

**345 Electromagnetism** (3). F, alternate years. The foundational equations of electromagnetism are developed and applied to simple charge and current distributions. Further applications are made to electromagnetic energy and electromagnetic properties of matter. Prerequisites: Physics 235 and Mathematics 270 or 271. Mathematics 231 and Computer Science 106 are also recommended. Not offered 2015–2016.

**346 Advanced Optics** (3). S, alternate years. The systematic application of Maxwell's Equations to electromagnetic radiation, including the interaction of light with matter, electromagnetic wave propagation, polarization, interference and diffraction. Includes a study of technologically significant systems such as waveguides, optical filters and fibers, laser cavities, and some electro-optical technologies. Prerequisites: Physics 246 and either Physics 345 or Engineering 302. Not offered 2015–2016.

**347 Relativistic Electrodynamics** (1). S, alternate years. Special relativity is reformulated in terms of 4-vectors and this new understanding is used to explicitly articulate the relativistic nature of Maxwell's equations. An introductory understanding of special relativity is assumed. Prerequisites: Physics 237 (or Physics 134, listed in the 2013–2014 catalog) and concurrent registration in Physics 346. Not offered 2015–2016.

**365 Thermodynamics and Statistical Mechanics** (4). F, alternate years. Equations of state, heat capacities, and the laws of thermodynamics. The thermodynamic potentials. Application to some simple systems and changes of phase. Kinetic theory. Statistical mechanics with emphasis on the canonical ensemble. Determination of entropy and the thermodynamic potentials with application to solids and gases. Introduction to quantum statistical mechanics. Prerequisite: Mathematics 231, Physics 306, and either Physics 132, Physics 134, or Engineering 209.

**375 Quantum Mechanics** (3). F, alternate years. The main emphasis is on wave mechanics and its application to atoms and molecules. One-electron atoms are discussed in

detail. Additional topics discussed are electronic spin and atomic spectra and structure. Nuclei, the solid state, and fundamental particles are also considered. Prerequisite: Physics 306 and Mathematics 231. (Concurrent registration in Mathematics 231 is allowed with permission of the Instructor.) A course including linear algebra is recommended.

**376 Quantum Mechanics** (3). S, alternate years. A continuation of Physics 375, which is a prerequisite.

**390 Independent Study in Physics**. F, I, and S. Independent readings and research in physics under the supervision of a member of the departmental staff. Prerequisite: A faculty sponsor and permission of the chair.

### Advanced Laboratory Courses

**339 Advanced Classical Mechanics Laboratory** (2). F, alternate years. Students perform multi-week experimental investigations related to classical mechanics. Possible topics include gravitation, torsion and rotation, damped and driven oscillation, coupled oscillators, waves in elastic or fluid media, and classical chaos. Concurrent enrollment in Physics 335 or permission of instructor is required. Not offered 2015–2016.

**349 Advanced Electromagnetism and Optics Laboratory** (2). S, alternate years. Students perform multi-week experimental investigations related to electric, magnetic, and optical effects in materials and devices. Possible topics include the Hall effect, electronic noise, magnetic resonance, optical spectra, optical interferometry, light scattering, imaging, polarization effects, electro-optic devices, and non-linear optics. Concurrent enrollment in Physics 346 or permission of instructor is required. Not offered 2015–2016.

**379 Advanced Quantum Physics Laboratory** (2). S, alternate years. Students perform multi-week experimental investigations related to the quantum nature of matter and light. Possible topics include: laser spectroscopy of atomic energy states, the Zeeman effect, electron diffraction, measurement of the muon lifetime, magnetic resonance, the Compton effect, nuclear radiation, and quantum entanglement. Concurrent enrollment in Physics 376 or permission of instructor is required.

**395 Physics Research, Writing, and Presentation** (0-3). F, I, and S. Completion of an approved experimental or theoretical research with presentation of results. The research may be done entirely as part of this course or through another avenue (e.g., summer research with a faculty member or an Advanced

Laboratory course). Normally, each student is required to submit a formal, written report and to present results in a department seminar and/or poster presentation. This course may be repeated twice. Prerequisites: A faculty sponsor and approval of the department.

## Political Science

*Professor K. den Dulk (chair), D. Koopman*  
*Associate Professors M. Watson, J. Westra*  
*Assistant Professors R. McBride, M. Pelz*

The department offers a variety of courses in the areas of American politics, comparative politics, international politics, methods of political analysis, and political theory. Students may major in political science or international relations (a more specialized political science degree). Those who major in political science may choose to follow a program of concentration in policy studies and civic leadership. Those who major in international relations may choose to follow a program of concentration in comparative politics, governments, and globalization or a program of concentration in international cooperation and conflict.

### **POLITICAL SCIENCE MAJOR**

(33 semester hours)

Political Science 101  
Political Science 240  
Political Science 251  
Political Science 399  
One from Political Science 214, 276, 277, or 279  
One from Political Science 207, 218, or 228  
Fifteen additional hours of political science coursework (which may include one interim course and/or six hours of internship credit) or completion of the Policy Studies and Civic Leadership Concentration requirements

### **Policy Studies and Civic Leadership Concentration**

Political Science 202 or 208  
Political Science 209  
Political Science 212  
One from Political Science 208, 234, 237, 310, or 318  
One internship (which may include POLS 380 or participation in the Henry Semester in Washington, D.C.)  
In addition, students must complete two cognate courses in one of the following categories:  
Business/economics: Business 160, 203, 204; Economics 151, 221, 222, or 339

Policy perspectives: Economics 330, Geography 351, Environmental Studies 210, Social Work 360, IDIS 205, or other approved policy-focused courses

### **POLITICAL SCIENCE MINOR**

(21 semester hours)

One from Political Science 101, 202, 209, 212, 234, 237, 310, or 318  
One from Political Science 214, 276, 277, 279, 301, 307, 321, or 322  
One from Political Science 207, 218, 228, 304, 309, or 319  
One from Political Science 110, 240, or 306  
Nine additional semester hours from the department, which may include one approved interim course and/or three hours of internship credit

### **INTERNATIONAL RELATIONS MAJOR**

(33 semester hours)

Political Science 214  
Political Science 207  
Political Science 251  
Political Science 399  
One from Political Science 101, 202, 212, 234, 237, or 310  
One from Political Science 110, 240, or 306  
Economics 222  
Twelve additional hours of political science coursework (which may include one

interim course and/or three hours of internship credit) or completion of one of the concentrations below

In addition, students complete three approved cognate courses or an approved off-campus semester program

### **Comparative Politics, Governments, and Globalization Concentration**

Three from Political Science 208, 276, 277, 279, 301, 307, 319, 321, 322, or International Development Studies 351 (must include at least two 300-level courses)

One from Political Science 218, 228, 276, 277, 279, 301, 304, 307, 309, 319, 321, 322, or an approved interim course or three hours of internship credit

### **International Cooperation and Conflict Concentration**

Three from Political Science 218, 228, 304, 309, and 319 (must include at least two 300-level courses)

One from Political Science 218, 228, 276, 277, 279, 301, 304, 307, 309, 319, 321, 322, or an approved interim course or three hours of internship credit

### **INTERNATIONAL RELATIONS MINOR** (21 semester hours)

Political Science 214

Political Science 207

One from Political Science 208, 276, 277, 279, 301, 307, 321, or 322

One from Political Science 218, 228, 304, 309, or 319

One from Political Science 101, 110, 202, 209, 212, 234, 237, 240, 306, 310, or 318

Six additional hours of political science coursework (which may include one approved interim course and/or three hours of internship credit)

### **SECONDARY EDUCATION POLITICAL SCIENCE MINOR** (21 semester hours)

Political Science 101

Political Science 202

Political Science 207

Political Science 110 or 240

Political Science 251

One from Political Science 214, 218, 276, 277, 279, 319, or 322

Interdisciplinary 375

### **SECONDARY SOCIAL STUDIES GROUP MAJOR** (40 semester hours)

Economics 221

Economics 222

Environmental Studies 210

History 151

History 152

History 229

History 359

Political Science 101

Political Science 202

Interdisciplinary 205

Interdisciplinary 375

Advisor approved Geography elective

Students pursuing the secondary social studies major must also complete a history major or a minor in economics, geography, or political science. Courses are allowed to overlap between the social studies major and the disciplinary major or minor.

### **ELEMENTARY SOCIAL STUDIES GROUP MAJOR** (39 semester hours)

Economics 221

Economics 222

Geography 241

History 151

History 152

History 229

Political Science 101

Political Science 202

Interdisciplinary 205

Education 305

Elective

Advisor approved Geography elective

Advisors for the group major are D. Miller, D. Howard, and R. Schoone-Jongen (History).

### **Internships**

Political science and international relations majors are encouraged to enroll in internship programs, and a variety of off-campus interims in the U.S. and abroad exist. The department encourages students to participate in the spring Henry Semester in Washington, D.C. or to enroll in Political Science 380, Internships in Politics and Government. Interested students should contact M. Pelz. A maximum of six semester hours may be applied toward the political science major and three semester

hours toward the international relations major. Students may take additional internship credits as electives and apply them toward the required total credits for graduation.

### Honors

To graduate with honors in political science or international relations, a student must: (1) complete at least six non-interim honors courses overall, with a minimum of four honors courses in the major, (2) attain a minimum GPA of 3.5 in each honors course as well as a minimum GPA of 3.5 both overall and in the major, and (3) complete a senior honors thesis. Interested students should contact J. Westra.

To be admitted to the major program in either political science or international relations, a student must have completed Political Science 101, 110, 214, or 207 with a minimum grade of C (2.0).

### COURSES (POLS)

**101 Ideas and Institutions in American Politics** (3). F, S. A study of American national politics. The course emphasizes the social context, constitutional foundations, processes, and functions of American politics. Different faculty members employ a wide variety of teaching methods, from lectures to small groups to simulations.

**110 Persons in Political Community** (3). F. This course examines how different conceptions of identity relate to different understandings of political community, and therefore, to the question of who and what a citizen is. Students analyze a variety of conceptions of citizenship, drawn from a range of philosophical traditions and empirical models. They then explore how a Reformed understanding of citizenship affects the way we think of ourselves as members of different political communities.

**202 State Politics and American Federalism** (3). S. This course provides a comparative study of American politics at the state level. Attention is given to the historical development of state governments, their structural characteristics, and policy-making in important areas such as education, social welfare, land-use, criminal justice, and transportation. Not offered 2015–2016.

**207 International Cooperation and Conflict** (3). F, S. This course explores different theo-

retical approaches to the study of international cooperation and conflict. Students are introduced to a variety of explanatory frameworks for phenomena such as war, ethnic conflict, economic inequalities, environmental degradation, international trade, and globalization.

**208 Urban Politics** (3). S. This course examines urban politics, giving attention to the historical development of urban government, power and politics in contemporary cities, and metropolitics and metropolitan reform.

**209 Public and Non-Profit Administration** (3). S. This course introduces students to public administration, focusing on political management (political environment, intergovernmental relations, administrative ethics), program management (planning, decision-making, organizing, leading, implementing) and resources management (personnel management, budgeting, information management). It also examines the politics and operations of public agencies and non-profit organizations. Not offered 2015–2016.

**212 American Public Policy** (3). S. As an introduction to public policy, this course focuses on (1) the ways social, economic, and political institutions influence policy formation, (2) methods of evaluating public policy, and (3) the historical development and current content of American public policy in key areas such as environment, social welfare, health care, and education.

**214 Governments and Globalization** (3). S. This course introduces students to a variety of theoretical and methodological approaches used in the study of comparative politics. Students will explore political institutions, intrastate conflict, human rights, environmental protection, and social welfare policies from a comparative perspective. Special attention is given to thinking about how states fit within broader regional communities that collaboratively address these issues.

**218 American Foreign Policy** (3). F. This is an analytical view of American foreign policy, including its domestic sources, the process of formulating policy, the instruments of American diplomacy, the nature of U.S. relations with hostile powers, allies, emerging powers, and the United Nations, and the limitations and potential of American foreign policy.

- 228 Global Politics of Human Rights (3).** F This course examines the emergence and institutionalization of human rights in the international arena during the 20th century. It analyzes the idea of human rights and examines the place of this idea in particular areas of concern, such as race, gender, religion, and the meeting of basic material needs. It questions the assertion and defense of human rights, by examining issues such as genocide, displaced persons, humanitarian intervention, and the role of international organizations. Not offered 2015–2016.
- 234 The President and Congress (3).** S. The course analyzes the powers and processes of these two institutions of American government and the changing relationship between them. Not offered 2015–2016.
- 237 Parties and Interest Groups (3).** S. The course investigates the nature and importance of political parties and interest groups for American politics. Topics include party development, interest group mobilization, and party organization. In election years, students enrolled in the course are encouraged to participate in the political campaign of the party or candidate of their choice.
- 240 Freedom, Justice, and Political Authority (3).** S. This course provides an introduction to the history of political thought. By examining such concepts as freedom, authority, and justice, as they are understood by representative modern and pre-modern political thinkers, the course attempts to uncover the major strands of historical development in Western political thinking.
- 251 Foundations of Political Science Research (3).** F This course examines the philosophical assumptions, theoretical issues, methodological approaches, and analytical tools used in analyzing American, comparative, and international politics. Not recommended for first-year students. As a supplement to this course, Statistics 143 is strongly encouraged.
- 276 Latin American Politics (3).** The course provides an analysis of modern Latin American politics with special emphasis on historical patterns, democratic transitions, economic development, and human rights. Not offered 2015–2016.
- 277 Asian Politics (3).** S. The course examines the governments and politics of China, Japan, India, and select Asian states such as the Philippines and South Korea. Not offered 2015–2016.
- 279 African Politics (3).** F This course is a study of the politics and governments of African states. It questions why some states make better progress towards the goals of stability, democratization and socioeconomic development than others. Specific issues examined are military rule, corruption, ethnic and religious strife, poverty, human rights, and health.
- 295 Special Topics in Political Science (3).** F, I, or S. Content for this course varies.
- 301 Institutions, Civil Society, and Revolution (3)** S. This course introduces students to the political institutions of different types of states and focuses on how these institutions impact the citizens of those states. Students are trained to analyze how political institutions shape legal protection, conflict, political and economic development, and states' ability to interact regionally and internationally. The course has a special emphasis on contestation within political systems and how this contestation can induce peaceful change or foster conflict. Recommended: Political Science 214. Not offered 2015–2016.
- 304 International Peace and Security (3).** F The course examines the theory and practice of international peace and security since the end of the Cold War, causes of war and war termination, military strategy, proliferation, nonproliferation and counterproliferation, security institutions, and international order. Recommended: Political Science 207. Not offered 2015–2016.
- 306 Political Liberalism and Its Critics (3).** F The course focuses on representative political theorists from the sixteenth through the twentieth century, with special attention to modern conceptions of and reactions to liberalism. Recommended: Political Science 240.
- 307 Civil War, Ethnic Conflict, and Terrorism (3).** F This course addresses how states use domestic policies to manage intrastate and transnational conflict in different forms. Topics include the causes and consequences of domestic conflict and the ways that conflict is perpetuated through the domestic institutions

of states. Special attention is paid to the way that conflict within states can spillover into regional conflict and the ways that states differently respond to the interference of other states and international institutions in their domestic affairs. Recommended: Political Science 214.

**309 International Organizations and Law** (3). F The course examines international organizations and international law, including their function and processes, their limits and possibilities, and their relationship to the international system. Recommended: Political Science 207.

**310 American Constitutional Foundations** (3). S. The course is a comprehensive study of the role of the courts in the American political system, focusing on the Supreme Court's role in constitutional interpretation. Recommended: Political Science 101. Not offered 2015–2016.

**318 American Elections and Mass Media** (3). F The course provides a survey of the relationship between American politics and the mass communications media. The course covers the way the federal government, through its regulations and its dissemination of information, affects the operations of the media, campaigning and elections, and how the media influence the social and political values of Americans and the functioning of the political system. Recommended: Political Science 101. Not offered 2015–2016.

**319 International Political Economy** (3). S. This course examines how competing political philosophies and ideologies explain different economic practices of states, how political forces and institutions affect the operation of international markets, and how global economic institutions operate. The course investigates the political controversies that surround the actions of central global economic institutions as well as the domestic political issues that result from international economic forces. Recommended: Political Science 207, 309, Economics 222.

**321 Religion and Politics in Comparative Perspective** (3). S. This course examines religion as an agent of political mobilization and change across different cultural contexts in terms of its historical development, cultural manifestation, and its effects on the political system.

**322 Global Democratization** (3). S. This course examines the factors that have contributed to and hindered the recent emergence of democratic governance in Southern Europe, Latin America, Eastern Europe, Russia, and Africa. Attention is given to the relationship among democracy, development, and political culture. Recommended: Political Science 214.

**380 Internship in Politics and Government** (2-6). F, I, and S. These internships, which require students to apply the tools of political science in state or local government settings, involve sixteen hours of work a week under the direction of an agency supervisor and Calvin instructor. Each intern keeps an analytical journal and submits a final summary paper. Prerequisites: sophomore, junior, or senior status, appropriate course background in political science or related fields, and permission of the Calvin instructor.

**390 Independent Study** F, I, and S. Reading or directed projects for majors. Open with the permission of the chair and the instructor under whom the work will be done.

**399 Research Seminar in Political Science** (3) F A study of the worldview foundations of political ideologies, political science theories, and research methods. Emphasis is on reading and discussion of significant texts within both the discipline and Reformed thought. The second half of the course allows students to engage in a major research project applying social scientific methods to addressing a well-defined research question in political science. Prerequisites: junior or senior standing, completion of biblical or theological foundations, philosophical foundations, Political Science 251, and two additional courses in the Department.

# Psychology

Professors C. Beversluis, L. De Haan, \*M. Gunmoe, P. Moes (chair), A. Shoemaker,  
S. Stehouwer, D. Tellinghuisen

Associate Professor \*\*B. Riek, J. Yonker

Assistant Professors E. Helder, E. Jones

The department offers a varied set of courses dealing with important facets of individual human functioning. The major and minor programs in psychology are designed to allow students flexibility to select courses that fit their present interests and their future expectations. Students majoring in psychology often enter human service careers or they pursue graduate study in psychology and related fields. A student handbook for majors can be obtained from the department office. Starting in the fall of 2015, the Psychology Department is also offering an optional Neuroscience Concentration within the major. See the full description and requirements for this concentration below.

Students planning a major or minor in psychology are advised to take Psychology 151 as their first course in psychology. Psychology 151, 255, and 399 satisfy requirements for the general college core as well as for major or minor programs of study in psychology. The college's cross-cultural engagement (CCE) requirement can be met through the Psychology 208/209 sequence or the psychology interim in Europe.

## PSYCHOLOGY MAJOR

(At least 32 semester hours)\*

Psychology 151

Psychology 255

Psychology 256

One from Psychology 343 or 344

Psychology 399

At least one from two of the following

three knowledge domains

Psychology 208 or 201 (Developmental)

Psychology 310 or 311 (Social Cultural/  
Individual Differences)

Psychology 322, 332 or 334 (Learning/  
Cognitive)

Two electives numbered 200-390

One elective numbered 300-379

Completion of psychology department  
assessment test

\* *Students must complete a minimum of  
10 psychology courses and at least 32  
semester hours; interim courses are not  
accepted toward the major.*

## Cognate

(4 semester hours)

Biology core or equivalent

Students must maintain a 2.0 in psychology courses in order to graduate with a major in psychology. Students may include developmental psychology courses from either group A (Psychology 208, 209) or group B (Psychology 201, 202)—but not both groups—as part of their major.

Students should ordinarily take Psychology 255 during their sophomore year and Psychology 256 in the semester following completion of Psychology 255. Students may not take Psychology 255 and 256 simultaneously.

When possible, students are encouraged to postpone taking courses numbered 330 or above until after the completion of Psychology 256. Psychology 399 is a course that may be taken either fall or spring semester of the senior year, or in the junior year if a student has completed a majority of the psychology courses that are required for the psychology major.

Students intending to do doctoral work in psychology are strongly encouraged to take Psychology 356 during their junior or senior year and to include courses from all three of the knowledge domains (see previous) in their program of study. When selecting courses, students are encouraged to follow the recommended four year plan for the general Psychology major or the plan for majors with a neuroscience concentration. These plans are included in the department handbook (available in the Psychology office) and posted on the department website.

All majors must complete the Psychology department senior assessment during their last semester on campus. Information on the senior assessment is available from the Psychology department office.



**PSYCHOLOGY MAJOR -  
NEUROSCIENCE CONCENTRATION**  
(42-45 semester hours)

The neuroscience concentration in psychology seeks to provide students with an interdisciplinary understanding of neuroscience, giving them a deep understanding of the biological sciences and integrating this knowledge with diverse subject areas such as psychology, chemistry/biochemistry, physics, computer science, and philosophy. This training prepares students for graduate school in neuroscience and professional fields (e.g., medicine, dentistry, clinical psychology, veterinary medicine, physical therapy), as well as careers in biotechnology firms, government laboratories, pharmaceutical companies, education, law, and business. Students desiring greater focus on biological, chemical or physical aspects of neuroscience should consider the neuroscience concentrations offered through the Chemistry and Biology Departments. Students considering the neuroscience concentration within Psychology should contact P. Moes or E. Helder for additional advising. See also the model four year plan associated with this concentration in the department handbook (available in the Psychology office) and posted on the department website.

Psychology 151  
Psychology 255  
Psychology 256  
Psychology 343  
Psychology 344  
Psychology 356  
Psychology 380 or 390  
One from Psychology 334 or 335  
One from Psychology 399 or Philosophy 318  
At least one from Psychology 201, 208,  
310, 311  
Two electives numbered Psychology 200-390  
One elective numbered Psychology 300-379

**Cognates**

(22-24 semester hours)

Biology 141  
Biology 206  
Chemistry 103/104 or 105  
Three courses from at least two disciplines:  
Biology 160, 205, 207, 321, 325, 333,  
335, 338; Chemistry 253, 261, 262, 303  
(or Neuropharmacology interim); Phys-  
ics 133, 221, 222, 223, 235, Medical

Physics (or Biophysics interim); Com-  
puter Science 112 (prerequisites apply),  
212, 300 (Bioinformatics only), 344; A  
maximum of one interim may be used.

**PSYCHOLOGY MINOR**

(At least 18 semester hours)

Psychology 151  
At least one from Psychology 255, 256,  
330-344  
Four psychology electives

Students must complete a minimum of 6 psychology courses and a minimum of 18 semester hours within the Psychology department; interim courses are not accepted towards the minor. In some situations, students may be permitted to count Statistics 143 or Sociology 255 as one of the four electives. Non-Psychology-department substitutions are NOT permitted in the “at least one from” group (i.e., students who use Statistics 143 or Sociology 255 as an elective will need to complete a Psychology course numbered 256 or higher to meet the “at least one from” requirement).

Students may include developmental psychology courses from either group A (Psychology 208, 209) or group B (Psychology 201,202)—but not both groups—as part of their minor.

**SECONDARY EDUCATION**

**PSYCHOLOGY MINOR**

(At least 20 semester hours)

Psychology 151  
Psychology 201  
Psychology 212  
Psychology 310  
At least one from Psychology 255, 256,  
330-344  
Psychology 399  
One additional psychology elective is  
needed to reach at least 7 courses and  
20 semester hours.

Students are encouraged to take Psychol-  
ogy 255 to fulfill the core requirement in  
mathematics if their program allows.

**Honors**

Students wishing to graduate with honors  
in psychology must maintain a minimum col-  
lege GPA of 3.5 as well as 3.5 within the major.  
Students must complete at least six honors  
courses (18 semester hours minimum). Three  
of these courses must be in psychology and  
three must be from outside of the major. One of

the psychology honors courses must involve an honors research paper in Psychology 356 or a comparable honors project in Psychology 390.

### Internships

Psychology majors who have demonstrated ability in their psychology courses are encouraged to apply for an internship placement during their junior or senior year. Psychology 380 provides a four-semester hour credit internship experience in one of a variety of areas of professional psychological practice and/or research (see course description). These experiences can provide important background for bachelor's degree level employment or graduate education in psychology.

### COURSES

**151 Introductory Psychology: Perspectives on the Self** (3). F, S. This course provides an introduction to psychology's study of the biological, affective, cognitive, and social dimensions of human identity and behavior. It includes the consideration of such issues as perception and consciousness, learning and memory, motivation and emotion, personality development and social interaction, stress and adjustment. Students are introduced to the methods of psychological research and to the role of psychology in scientific endeavor and human application. Through assigned reading and writing as well as classroom discussion, students learn to critically weigh alternative claims regarding human behavior and to appreciate a holistic approach to the study of persons.

**201 Developmental Psychology: Lifespan** (3). F, S. An overview of human psychological development from birth to death. The primary objective is to understand the behavior characteristic of each stage of development and the factors which influence that behavior. Recommended for non-majors. Not open to students who have taken or plan to take Psychology 208 or 209. Prerequisite: Psychology 151 or Education 302, or permission of the instructor.

**202 Youth Faith Development and Spiritual Formation** (3). S. This course examines how faith is formed and developed by studying influential theories of faith formation (e.g., Fowler's stages of faith, Objects-Relations) and the general developmental theories on which these faith formation theories are based. Approximately 1/4 of the course is devoted to

faith formation in children with particular emphasis on how early attachments shape a person's view of God. The remainder of the course focuses on the development of religious identity and practices during adolescence and early adulthood. Contextual influences examined include family, peers, schools, religious congregations, historical traditions, organized rites of passage, and post-modern culture. Religious identity is viewed as intertwined with gender and ethnic identity. Recommended for non-majors. Not open to students who have taken or plan to take Psychology 208 or 209. Prerequisite: Psychology 151 or Education 302, or permission of the instructor.

**208 Developmental Psychology I: Child** (3). S. An overview of normal development from conception through puberty. Organization is chronological (infant, toddler, preschool, middle-childhood) and conceptual (physical development, cognitive development, social-emotional development, spiritual development). Service learning at an area preschool required of all students. Recommended for psychology majors and for non-majors intending to work with children. Not open to students who have taken or plan to take Psychology 201 or 202. Prerequisite: Psychology 151 or Education 302 or permission of the instructor. Option to satisfy the cross-cultural engagement core requirement by completing both Psychology 208 and 209.

**209 Developmental Psychology II: Adolescence and Adulthood** (3). F. An overview of normal human development from puberty through late adulthood. Organization is chronological (early adolescence, middle adolescence, late adolescence/early adulthood, etc.) and conceptual (physical development, cognitive development, social-emotional development, spiritual development). Recommended for psychology majors. Prerequisite: Psychology 208 or permission of the instructor. Not open to students who have taken or plan to take Psychology 201 or 202. Option to satisfy the cross-cultural engagement core requirement by completing both Psychology 208 and 209.

**212 Psychopathology** (3). F, S. A study of the wide range of abnormal behaviors. Emphasis is on causes, dynamics, and classification, with some attention to treatment approaches. Prerequisite: Psychology 151 or permission of the instructor.

**213 Mental Health and the Classroom** (3). An introduction to the developmental needs and common developmental stressors of school age children. Emphasis is on the methods of communication and classroom management, which allow the teacher to promote healthy adjustment. Prerequisite: Psychology 151 or Education 302, or permission of the instructor. Not offered 2015–2016.

**220 Psychological Perspectives on Marriage and the Family** (3). S. This course focuses on psychological theory, research, and perspectives on family life. The course examines historical and current conceptualizations of the family as well as cross-cultural and alternative conceptualizations. Psychological perspectives on marriage preparation, marriage, divorce, infertility, child rearing, and single parenthood, as well as developmental changes in the family are addressed. The course also focuses on family dysfunction, treatment, and health. Prerequisite: Psychology 151 or permission of the instructor.

**222 Human Sexuality and Gender** (3). F. This course explores the ways that sexuality and gender have been studied as variables in psychological research and theory. Special attention will be given to recent theories of physiological and cultural influences on men's and women's development. Biblical and popular perspectives on sexuality and gender issues will be examined, and promises and problems in gender relations will also be studied. Prerequisite: Psychology 151 or permission of the instructor.

**255 Statistics and Research Design** (4). F, S. This course is an introduction to statistics and computer application in psychology. Concepts and procedures taught include levels of measurement, measures of central tendency, correlation techniques, probability theory, and hypothesis tests. Lab work includes the use of SPSS software. This course is intended to meet the core mathematics requirement for psychology majors and minors. Psychology students typically take this course in their sophomore year. Prerequisites: An introductory course in one of the social sciences (e.g., Psychology 151) and meeting the Calvin admission requirement in mathematics.

**256 Fundamentals of Research and Practice** (4). F, S. This course will provide hands-on,

participatory research activities that build on the basic theories and applications of Psychology 255. Students will be conducting projects that allow the learning of fundamental practice skills in community or social science research, but also provide additional practice and theory building in statistics and basic research methods. Specific concepts will include basic perspectives in social science research, the fundamentals of measurement in social sciences, sampling techniques, survey design, application of statistical methods to real world situations, use of SPSS, ethical issues in research, and the critical evaluation of research methods and results. Prerequisites: An introductory course in one of the social sciences (e.g., Psychology 151) and Psychology 255.

**280 The Helping Interview: Theory and Practice in Clinical Settings** (2). This course focuses on psychological theory, research, and practice in regard to the helping interview. Emphasis is on historical and current conceptualizations of interviewing techniques and processes. Theory, issues, and techniques regarding the interview are applied to clinical settings. Prerequisite: Psychology 212 or permission of the instructor. Not offered 2015–2016.

**306 History and Systems of Psychology** (3). This course explores the historical roots of some of the current directions and tensions in the field of psychology. Questions about human nature and the nature of mind and knowledge are addressed through the study of ancient, medieval and modern psychological theory. Prerequisites: two courses in psychology or permission of the instructor. Not offered 2015–2016.

**310 Social Psychology** (3). F, S. A study of how people think about, influence, and relate to one another. Attention is given to such topics as persuasion and attitude change, conformity and obedience, group conflict and decision-making, stereotypes and illusions of social thought, attraction and prejudice, and altruism and aggression. Prerequisite: Psychology 151 or permission of the instructor.

**311 Theories of Personality** (3). F, S. A study of the enduring human personality characteristics that often distinguish one person from another. Extensive consideration is given to biological, psychodynamic, social, cognitive, and trait-descriptive theories of personality structure and functioning. The course also

introduces students to a variety of personality scales and inventories designed to identify important individual differences in personality. Prerequisites: Psychology 151 and 212 or permission of the instructor.

**312 Clinical and Counseling Assessment (3).** S. An introduction to the theoretical and practical issues of psychological testing and measurement. Topics include: Test construction, reliability and validity of tests, evaluation of commonly used tests including measures of intelligence, personality, development, and emotion, exposure to measures used in multiple settings including neuropsychology, assessment in clinical and counseling psychology, school assessment, and industrial/organizational psychology, and the socio-cultural, educational, and legal issues involved in testing and measurement. Prerequisite: Psychology 255 or permission of the instructor. Not offered 2015–2016.

**314 Theories of Counseling and Psychotherapy (3).** F. An introduction to counseling and psychotherapeutic methods for dealing with emotional disorders. The course includes an overview of major approaches to counseling and psychotherapy with an analysis of the theoretical aspects and techniques employed. An attempt is also made to integrate these various approaches and to view them from a Christian perspective. Prerequisites: Psychology 212 and 311 or permission of the instructor.

**322 Perspectives in Psychology: Principles of Learning and Behavior Modification (3).** F. An introduction to learning principles, derived from operant and classical conditioning, applied to changing human behavior in clinical settings and in everyday activities. Students will learn to use principles and procedures of behavior modification, including reinforcement, extinction, punishment, stimulus control, discrimination, shaping, prompting, and chaining. In addition, students will learn research designs used in behavior modification including A-B, A-B-A-B and multiple baseline designs. Students will also conduct a self-management project using various principles and procedures designed to modify their own behavior. Prerequisite: Psychology 151 or permission of the instructor. Recommended: junior or senior status.

**332 Psychology of Learning Processes (4).** A consideration of how research findings and theory relate to learning processes. Included

are such issues as the role of reinforcement and punishment, methods of enhancing or suppressing performance, biological limits on learning, stimulus generalization, and discrimination learning. The importance of learning theory for psychology in general is stressed. Two-hour laboratory each week. Prerequisite: Psychology 151 or permission of the instructor. Recommended: junior or senior status. Not offered 2015–2016.

**334 Cognitive Psychology (3).** S. A survey of research and theory in the study of human cognition. The course covers the acquisition, representation, and use of knowledge with emphasis on the processes of memory, language, and decision-making. Prerequisite: Psychology 151 or permission of the instructor. Recommended: junior or senior status.

**335 Health Psychology (4).** S. This course considers the psychosocial and physiological processes that underlie wellness. The role of stress in cardiovascular disease, cancer, drug addiction, sleep disorders and eating disorders is considered. The centrality of immune and cardiovascular system functioning in health and illness is emphasized. Attention is given to the effectiveness of a wide variety of coping strategies including pain control, physical exercise, and religious practice. Across topics, the course will emphasize current treatment procedures and research issues in the field. Laboratory experiences will permit students the opportunity to learn and practice skills associated with the health psychology profession and research. Prerequisites: Psychology 151 and one from Biology 115, 205, 206, 230, 323 or 331, or permission of the instructor. Recommended: junior or senior status.

**343 Behavioral Neuroscience (4).** F. This course explores the rapidly expanding knowledge of genetics, bodily function, and brain function that is having a major impact on the way we understand behavior and the essence of our human nature. The course focuses on basic nerve cell function, neuroanatomy, and how “lower level” brain systems function in our everyday behavior. Specific topics include the relationship of brain function to basic visual and other sensory processes (e.g., hearing, touch, and pain), sleep, sexuality, basic motivations such as hunger & thirst, basic emotional functions, and basic memory and learning processes. The course also examines the biological basis for

drug action and dependency, the biological basis for nervous system diseases (e.g., Parkinson's disease), as well as the response of the nervous system to damage or disease. Finally, several class discussions and readings focus on our understanding of persons in light of current brain-behavior research. Required laboratory and off-campus experiences introduce basic anatomy and physiology of the brain, electrophysiological measures (EEG), behavioral measures of brain function, and investigative technology in neuroscience. Prerequisites: Psychology 151 and biology core or permission of the instructor. Recommended: junior or senior status.

**344 Cognitive and Clinical Neuroscience** (3). S. This course explores the rapidly expanding knowledge of "higher level" brain function and clinical applications of this knowledge. Specific topics include the relationship of higher cortical function to attention mechanisms, complex visual experience, amnesia syndromes, language and reading disorders, hemisphere specialization, decision making and "executive function," problem solving, consciousness, anxiety, depression, schizophrenia, and other bio-behavioral disorders (e.g., Tourette's syndrome). Class discussions and readings also focus on our understanding of consciousness and personal responsibility in light of this research. The course includes an introduction to the work of clinical neuropsychologists and cognitive neuroscientists, as well as the latest in brain scanning technology by way of clinical case studies and possibly through off-campus experiences. There is no separate laboratory for this course. Prerequisites: Psychology 151 and biology core or permission of the instructor. Recommended: junior or senior status.

**356 Experimental Psychology** (4). F. This course explores experimental designs and the statistical techniques related to them. Students will have hands-on experience with experimental control techniques, factorial designs and interaction effects, and the use of the analysis of variance. In addition, students will design their own experimental research, implement their studies and analyze the resulting data. This course is a preparation for graduate-level research. Prerequisites: Psychology 255 and 256 and departmental approval of student application.

**366 Industrial and Organizational Psychology** (3). F. A consideration of psychological con-

cepts and research related to human action in work situations, particularly in organizations. The principles of industrial and organizational psychology and human resource management are applied to current topics including organizational identity, psychometrics for screening and selection, employee socialization, performance measurement and management, and employee attitudes and behaviors. The relationship of psychological theory and practice are analyzed through case studies of organizational experiences. Also listed as Business 366. Prerequisites: Business 160 or Psychology 151 and Statistics 143 or Psychology 255.

**380 Internship in Psychology** (4). F, S. Students are placed in a field experience related to a specialized area of psychological practice or research (e.g., school psychology, industrial-organizational psychology, or counseling-rehabilitation psychology). Students work eight hours per week under the direction of an on-site supervisor and participate in regular seminar meetings conducted by the college instructor. These experiences will introduce students to service in professional psychology, as it is related to issues of psychological theory, research, client characteristics and needs, professional standards, and Christian discipleship. Each student will author a project that communicates learning throughout the internship. Prerequisites: junior or senior psychology major, completion of course sequences related to the internship specialization (information available from the Psychology Department), and departmental approval of student application.

**390 Independent Study**. F, I, and S. Prerequisite: permission of the department chair.

**399 Psychology and Religion** (3). F, S. This capstone course examines relationships between psychology and religion. It includes discussions of how several major psychologists have attempted to explain religious faith and practice. The course examines frameworks that have been proposed for relating Christian beliefs about persons and psychological explanations. Consideration is given to how these frameworks have influenced recent investigations of areas related to our experiences of Christian faith (e.g., perception, moral development, and emotion). Prerequisites: Psychology 151 and three additional psychology courses or permission of the instructor. See financial aid for a description of the Templeton Award.

# Public Health

The public health major is an interdisciplinary major that engages students with the diverse field of public health. The major serves as a foundation for students interested in a broad range of public health careers, from biostatistics and epidemiology to health education and health policy to global and environmental health. It also prepares students for graduate training in these fields or in related professional health careers such as medicine, nursing, or social work. Students are strongly urged to do an internship as part of the major.

The public health minor is intended for students who are following a disciplinary or professional major and who also have an interest in studying public health at local, national, and global levels. Because the study of health issues is truly interdisciplinary in scope, the public health minor is appropriate for students majoring in the humanities, the social sciences, or the natural sciences. While disciplinary or professional majors with health interests are encouraged to complete the entire minor, the public health courses also may be taken singly as electives to enrich a program of study.

The interdisciplinary public health major consists of 15 courses. Seven of these courses are required and four courses meet distribution requirements. An additional four advisor-approved and program-approved elective courses are intended to deepen student learning in a key area of public health.

The program co-directors are A. Hoogewerf (Biology) and S. Vander Linde (Economics). Advisors for the Public Health program are K. Alford (Social Work), A. Ayoola (Nursing), P. Bailey (Computer Science), C. Brandsen (Sociology), C. Feenstra (Nursing), M. Pelz (Political Science), and J. Yonker (Psychology).

## **PUBLIC HEALTH MAJOR**

(44-47 semester hours)

Economics 241

Philosophy 212

Public Health 101

Public Health 248

Public Health 295

Public Health 395

Political Science 212 or Social Work 360\*

Sociology/Social Work 250

One from Statistics 143 or 145, Psychology 255, or Sociology/Social Work 255

One from Psychology 335, Health Education 265, or 266\*

One from Biology 364, Environmental Studies 210, or Interdisciplinary 212

Four 200 or 300-level advisor-approved electives, two of which must be 300-level courses; may include Public Health 380

\*Or approved special-topics course

## **PUBLIC HEALTH MINOR**

(23 semester hours)

Public Health 101

Public Health 248

Public Health 295

Public Health 395

One elective from Health Education 265, 266, 307, Psychology 335, Biology 364,

Environmental Studies 210, or Interdisciplinary 212

One elective from Political Science 212, Economics 241, Social Work 360, or Social Work/Sociology 250

One additional elective from above lists or an advisor-approved elective

One from Statistics 143 or 145, Psychology 255, or Sociology/Social Work 255

## **Courses (PUBH)**

**101 Introduction to Public Health (3).** F This course introduces students to the broad interdisciplinary field and history of public health in both the U.S. and globally. The course explores the social, political, and environmental determinants of health and disease, with special attention to how individual factors (such as education, occupation, race, and age) and structural factors (such as war, poverty, and health care systems) shape health outcomes. Students are introduced to both U.S. and global public health infrastructures that focus on improving and monitoring the public's health. Several topical areas with priority interest to public health are considered such as maternal and child health, disaster management, terrorism, control of infectious disease, food produc-

tion, and population growth. Students are also introduced to global health care institutions that develop, finance, and respond to global health care initiatives. Throughout the course, students are challenged to consider a variety of ethical issues integral to public health as they consider this field from a Christian perspective. Faculty employ multiple teaching methods including lecture, discussion, case studies, guest lectures, and field trips.

**248 Epidemiology (4).** F Epidemiology is built upon the premise that poor health outcomes are not randomly distributed in a population. By comparing the sick or injured to the well we can begin to identify the underlying causes of disease and injury. This course provides an epidemiologic approach to the study of incidence, prevalence, and patterns of disease and injury in populations and the application of this study to the control of public health problems. Students will describe the study designs used in epidemiology, learn to calculate basic epidemiologic measures, identify threats to study validity, identify public health surveillance and screening programs, and learn to draw appropriate inferences from epidemiologic data and reports. Lecture and laboratory. Prerequisites: Public Health 101 and one from Statistics 143, Psychology 255, or Sociology/Social Work 255.

**295 Public Health Seminar (0).** F and S. Various topics related to public health are presented by visiting speakers, faculty, and students. Public health majors must register for

at least two semesters of Public Health 295, ideally during their junior and senior year.

**380 Internship in Public Health (3, 4).** F and S. This course links students to internship opportunities in public health settings where they are assigned specific public health-related responsibilities. Students work 10-12 hours (3 semester hours) or 13-15 (4 semester hours) per week under the supervision of approved agency supervisors and faculty coordinators. Students will meet with their faculty coordinators bi-weekly, write reflective journals based on assigned readings and internship experiences, and submit final written papers evaluating their internship learning. Students will also be evaluated by their agency supervisors based on achievement of learning contract goals established at the outset. Prerequisites: junior or senior standing; permission of the instructor; and completion of at least five courses in the major.

**395 Integrative Seminar in Public Health (3).** S, alternate years. This seminar revisits the major's learning goals through advanced study of public health's foundation areas of inquiry (biostatistics, epidemiology, health behavior, health care policy, and global/environmental health). Students are involved in seminar presentations and the preparation of a major integrative research paper and/or project. Prerequisite: senior standing or instructor permission; six major courses (excluding 295) must be completed or in progress.

# Religion

Professors D. Crump, C. de Groot, A. Griffioen, D. Harlow, W. Lee, R. Plantinga,

K. Pomykala (chair), L. Smit, T. Thompson, R. Whitekettle

Associate Professor M. Lundberg

Adjuncts T. Cioffi, J. Witvliet

The department offers a religion major. Students may design interdisciplinary majors, such as religion and philosophy, religion and history, or religion and sociology. Three minor concentrations are offered: A religion minor, a secondary education religion minor, and a ministry leadership minor. A departmental advisor will help design the program according to a student's specific interests.

## RELIGION MAJOR

(30 semester hours)

One from Religion 211-214 (Old Testament)

One from Religion 221-224 (New Testament)

One from Religion 230-237, 251 (systematic theology)

One from Religion 241-244 (historical theology)

One from Religion 250, 255, 352 356 (religious studies)

Three 300-level electives (excluding the course used to fulfill the religious studies requirement and 396)

One additional elective in religion (excluding 121 & 131)

Religion 396

Completion of one course as "writing enriched" prior to senior year

The religion major is designed for students seeking a strong background in biblical, theological, and religious studies as preparation for various professions, including Christian ministry, and for graduate education. A departmental interim course may be included as an elective course. As part of the departmental writing program, majors must take one departmental course (excluding Religion 121, 131, 357, 396) prior to their senior year as writing enriched. This course will include additional writing, a revision component, intensive evaluation, and will prepare the student for Religion 396. Students considering seminary or graduate school should consult their advisor about a recommended language cognate. Admittance to the major program requires completion of a core course with a minimum grade of C (2.0).

## INTERDISCIPLINARY MAJORS

Interdisciplinary majors in religion and other fields may be designed according to the guidelines under programs of concentration in

the Core Curriculum section. For example, a student wishing to present an interdisciplinary major in religion and philosophy could take 4-6 courses (12-18 semester hours) in religion and 4-6 courses (12-18 semester hours) in philosophy, and 2 courses (6 semester hours) from a third discipline. Interdisciplinary majors must be carefully planned, accompanied by an academic rationale for an interdisciplinary field of study, and must be approved by both major department chairs and the registrar.

## RELIGION MINOR

(18 semester hours)

One from Religion 211-214, 221-224 (biblical studies)

One from Religion 230-237, 241-244, 251 (theological studies)

One from Religion 250, 255, 352-356 (religious studies)

One 300-level elective (excluding the course used to fulfill the religious studies requirement)

Two additional electives in religion (excluding 121 and 131)

The religion minor is for students who seek to develop a biblical and theological perspective for work in other disciplines and for Christian service. A departmental interim course may be included as an elective course.

## SECONDARY EDUCATION

### RELIGION MINOR

(21 semester hours)

Religion 121

Religion 131

Religion 211-214, 221-224 (biblical studies)

One from Religion 230-237, 241-244, Interdisciplinary 234 (theological studies)

One from Religion 250, 255 (religious studies)

One 300-level elective in religion  
Religion 357



The secondary education religion minor is for students who plan to teach religion in secondary schools. T. R. Thompson is the advisor for the secondary education religion minor.

### MINISTRY LEADERSHIP MINOR

(18 semester hours)

The Ministry Leadership minor serves students with interests in Christian missions, and is offered through the Department of Congregational and Ministry Studies. This minor can be usefully combined with any major offered by the college, including but not limited to a Religion major. Students particularly interested in Bible, theology and religious studies in relation to missions are advised to select a Religion major program along with a Ministry Leadership minor with an emphasis in missions. This minor builds upon key biblical and theological foundations in order to explore the sociological and practical dimensions of Christian missions, culminating in an internship experience.

### COURSES (REL)

#### Basic Courses

**121 Biblical Literature and Theology** (3). F, S. This course is a study of the Bible within its literary, historical, cultural, and canonical context in order to understand its central theological teachings.

**131 Christian Theology** (3). F, S. A study of Christian theology in light of its historical development and ongoing significance, this course surveys the central teachings of the Christian Church as rooted in the Bible, formulated by key theologians, and summarized in the ecumenical creeds and Reformed confessions.

#### Intermediate Biblical Studies Courses

**211 Pentateuch** (3). F, S. A study of the first five books of the Bible. This course examines the accounts of creation, the fall, Israel's ancestors, the exodus, and the giving of the Law. Theological issues explored include the nature of God, human beings, and the world, our covenantal relationship with God, and the presence of God in historical events. Prerequisite: Religion 121 or 131.

**212 Old Testament Historical Books** (3). F. This course explores the Old Testament books of Joshua through 2 Kings, 1 and 2 Chronicles, Ezra, and Nehemiah in terms of their lit-

erary features, historical settings, and theological themes. Particular attention is devoted to the prophetic character of these works, which provide a theological interpretation of Israel's history. Prerequisite: Religion 121 or 131.

**213 Psalms and Wisdom Literature** (3). F, S. Students examine the books of Psalms, Proverbs, Job, and Ecclesiastes. The three focuses of the course are how to read poetry, the different categories of the Psalms and their interpretation, and the role of wisdom books in the Bible. Prerequisite: Religion 121 or 131.

**214 Prophets** (3). S. The books of Old Testament prophetic literature are studied, including Isaiah, Jeremiah, Ezekiel, and selected minor prophets. Each book is considered in light of its literary characteristics and sociohistorical context with a view to explicating the text's theological message and its contemporary relevance. Prerequisite: Religion 121 or 131.

**221 Synoptic Gospels and Acts** (3). F, S. This is a study of Matthew, Mark, and Luke-Acts. After dealing with introductory issues, this course examines the text and context of the books to discern their major themes. The relationship between the Synoptic Gospels and the historical Jesus is also considered. Prerequisite: Religion 121 or 131.

**222 Gospel and Letters of John** (3). F, S. This course studies the Fourth Gospel and 1-3 John. Students consider matters of introduction, historical context, interpretation of major themes, and distinctive theological contributions. Prerequisite: Religion 121 or 131.

**223 Paul's Letters** (3). F, S. A study of Paul's letters focusing on their meaning within the context of early Christian communities. Prerequisite: Religion 121 or 131.

**224 Revelation and General Letters** (3). F, S. This course studies Revelation and the general letters, including Hebrews, James, 1 and 2 Peter, and Jude, in terms of their literary features, historical setting, and theological emphasis. Prerequisite: Religion 121 or 131.

#### Advanced Biblical Studies Courses

**307 Biblical Interpretation** (3). Alternate years. A study of the methods and principles of biblical interpretation. Various exegetical and hermeneutical approaches will be examined and evaluated in terms of their usefulness for

understanding the meaning and message of the scriptures. Prerequisite: at least two courses in biblical studies or permission of the instructor.

**309 Biblical Theology (3).** F, alternate years. A course in constructive biblical theology, focusing on central themes, the problem of the unity and diversity of scripture, the “center” of biblical revelation, and proper methodology. Issues are considered in the context of historic and recent attempts to construct a biblical theology. Prerequisite: at least two courses in biblical studies or permission of the instructor.

**311 History and Archaeology of Ancient Israel (3).** Alternate years. A study of the history of ancient Israel from the patriarchs through Ezra in the context of recent research on this topic. This course will consider the sources for reconstructing the history of Israel, including the Old Testament, Ancient Near Eastern literary remains, and archaeological evidence, as well as appropriate methods for interpreting these sources. Prerequisite: 121 or an intermediate biblical studies course.

**313 When Women Read the Old Testament (3).** S, alternate years. In the last two decades, biblical interpretation by women and about women has blossomed and made significant contributions to the field of biblical studies. This course will study feminist approaches to the Old Testament and examine key passages relating to gender issues. Prerequisite: 121 or an intermediate biblical studies course.

**321 Judaism in the Time of Jesus (3).** Alternate years. A study of Jewish history, literature, and thought from 400 B.C. to A.D. 100, as a background for understanding the New Testament. Literature studied includes the Apocrypha and Dead Sea Scrolls. Prerequisite: 121 or an intermediate biblical studies course.

**323 Studies in Christian Origins (3).** Alternate years. A historically-oriented study of selected topics on the origins of Christianity during the first century, including the Jewish and Greco-Roman context of earliest Christianity, the historical Jesus, and the history and theology of the earliest Christian communities. Prerequisite: 121 or an intermediate biblical studies course.

## Intermediate Theological Studies Courses

**230 Revelation and Knowledge of God (3).** F This course is designed to help students explore Christian and Reformed concepts of revelation. Traditional models of general and special revelation and models of biblical inspiration and authority are explored and developed in the context of modern and post-modern concerns in philosophy and non-Christian religions. Prerequisite: Religion 121 or 131.

**231 The Triune God (3).** F, S. This course is designed to examine Christian concepts of God in considerable depth within the context of historic debates and modern discussions. Issues considered include the possibility and extent of human knowledge of God, evidence for God's existence, the attributes of God, and the nature of the Trinity. Prerequisite: Religion 121 or 131.

**232 Creation and Humanity (3).** F This course investigates Christian teaching about the creation of the world. Topics considered include the interpretation of Genesis 1 and 2, creation out of nothing, creation and evolution, the goodness of creation and the problem of evil, the image of God, the cultural mandate and the idea of stewardship, and the eclipse of creation in modern thought. Prerequisite: Religion 121 or 131.

**233 Christ and Reconciliation (3).** S. The main goal of this course is to provide students with an opportunity to examine and reflect upon historic and Reformed doctrines of the person and works of Christ in the context of contemporary analytic thought and current biblical theology. Topics include Christ as God and man in current discussion, New Testament Christology and the current debates, and Reformed Christology in the making. Prerequisite: Religion 121 or 131.

**234 Holy Spirit and Church (3).** F This course examines the person and the work of the Holy Spirit, especially as manifested in the formation of the universal and local church, in light of biblical teachings, confessional formulations, historical theological reflections, and personal experience. Prerequisite: Religion 121 or 131.

**235 Eschatology (3).** F Christian teachings concerning the end times and last things are studied in this course, including their biblical basis, historical formulations, and con-

temporary relevance. Topics covered include the return of Christ, the final judgment, the resurrection of the body, and eternal life. Millennialist and dispensationalist issues are also critically analyzed both historically and theologically. Prerequisite: Religion 121 or 131.

**237 Christian Worship** (3). S. A study of the history, theology, and practice of Christian worship. This course examines the relationship between theology and worship by considering the biblical basis for worship, the history of Christian liturgy, and contemporary worship. Examples of sermons, baptismal, and Lord's Supper practices, hymnody, prayers, dance, art, and architecture from both traditional and contemporary worship are studied. Prerequisite: Religion 121 or 131.

**241 General Church History** (3). Alternate years. A survey of the history of the Christian church from its beginning to the present time, noting deviations from apostolic faith and practice, the interplay with the political, the great church councils, the crises that emerge, divisions and reunions, and the confluence of forces that determine the complexion of the Christian church today. Not to be taken if students have taken or plan to take religion 243 or 244. Prerequisite: Religion 121 or 131.

**242 Theology in America** (3). F, alternate years. A study of the history and theology of Christianity in America from the immigration period to the present. Attention is paid to the European background, the colonial era and such movements as revivalism, evangelicalism, fundamentalism and liberalism. Prerequisite: Religion 121 or 131.

**243 History of Christian Theology I** (3). S. This is a historically oriented study of Christian theology in the Patristic and Medieval periods (100-1500). Particular attention is paid to the development of key Christian doctrines such as the Trinity and the Incarnation and to questions such as the relationship between faith and reason. Prerequisite: Religion 121 or 131.

**244 History of Christian Theology II** (3). F. This is a historically oriented study of Christian theology in the Reformation and Modern periods (1500 to the present). Particular attention is paid to the development of key Christian doctrines such as justification, sanctification, and the church and to questions such as the relationship between faith

and reason. Prerequisite: Religion 121 or 131.

**251 Christianity and Religious Plurality** (3). S. This course examines the relationship of Christianity to the religions of the world. An attempt is made to understand the phenomenon of religion from a theological perspective by investigating how various biblical and Christian writers have viewed Christianity's place in the religious history of the world. Special emphasis is placed on twentieth-century attempts to confront the reality of religious pluralism. Prerequisite: Religion 121 or 131.

### Advanced Theological Studies

**331 Theology: Theory and Method** (3). Alternate years. An investigation of the nature, task, and method of the discipline of systematic theology. A review of the pre-modern history of the concept of theology serves as a prelude to the focus of the course: the status of systematic theology in the post-Enlightenment period. Issues discussed include the relationships of theology to church, academy, and society. Thinkers and approaches dealt with include Schleiermacher, Barth, Tillich, Lonergan, Pannenberg, revisionism, and post-liberalism. Prerequisite: Religion 131 or an intermediate theological studies course.

**332 Theological Ethics** (3). F, alternate years. A study of Christian moral theory and its application to selected cases. This course examines how diverse understandings of God's relationship to the creation inform how Christians think about the moral life. Ethical issues such as war, human sexuality and reproduction, death and dying, and the environment are analyzed in light of theological commitments. Prerequisite: biblical and theological foundations core or permission of the instructor.

**333 Studies in Roman Catholic Theology: Contemporary Catholic Theology** (3). Alternate years. A sympathetic study of Roman Catholic theology, with particular attention to developments since the Second Vatican Council (1962-1965). Topics include scripture and tradition, grace and justification, church, liturgy, and sacraments, ethics and the church in the modern world, death and the afterlife, Marian devotion, ecumenism, ecclesiastical authority and papal infallibility, and the pontificate of John Paul II. Prerequisite: 131 or an intermediate theological studies course.

**341 Studies in Early and Medieval Theology: Medieval Scholastic Theology** (3). Alternate years. This course studies Medieval scholastic theology first by reading portions of Peter Lombard's *Sentences*, a 12th century work that systematized Christian theology in a new way and served as the primary textbook for theological study in subsequent centuries, and then by examining how this systematic approach was developed in the work of Abelard, the Victorines, Albert the Great, Thomas Aquinas, and Bonaventure.

**343 Studies in Reformation Theology: Calvin's Institutes of the Christian Religion** (3). Alternate years. This course reads and discusses Calvin's *Institutes* in order to understand Calvin's theology as a whole both within its historical context and with regard to its continuing significance. Prerequisite: Religion 131 or an intermediate theological studies course.

**345 Studies in Contemporary Theology** (3). S, alternate years. A study of selected figures, movements, and doctrinal topics in twentieth century theology. Prerequisite: biblical and theological foundations core, or permission of the instructor.

### Religious Studies

**250 Introduction to the Study of Religion** (3). A thematic introduction to the phenomenon of religion in comparative perspective. Issues examined include the dichotomy between the sacred and the profane, the nature of religious experience and its various expressions in life, the significance of myth and ritual, and differing analyses of human existence. Attention is also given to questions about the origin, nature, and function of religion in human life and society, and to issues pertaining to the study of religion in the humanities and social sciences.

**255 World Religions** (3). S. A historical investigation of the nature of religion by examining the chief theories and practices of some of the world's major, non-Christian religions, including Hinduism, Buddhism, Confucianism, Taoism, and Islam. Emphasis is placed on each tradition's analysis of the basic human problem and the solution that it offers to the problem. Some attention is also paid to new, emergent religious movements and their relationship to older established traditions. Prerequisite: one religion course.

**352 Judaism** (3). F, alternate years. A study of the major developments in Jewish history, thought, and practice from the second temple era to the present. Subjects studied will include rabbinic Judaism and its literature — the Mishnah and the Talmuds, medieval Jewish philosophy and mysticism, emancipation, Zionism, the Holocaust, and North American Judaism. Prerequisite: one religion course.

**353 Islam** (3). Alternate years. A historical and comparative study of Islam in its diverse regional and cultural settings, including the Middle East, Africa, Asia and the West. Topics will include the life and times of Prophet Muhammad, the Quran, the division between Sunni and Shia, and the formation of the traditions of Hadith and Shariah. Prerequisite: one religion course and sophomore or higher status.

**354 Hinduism** (3). Alternate years. This course introduces Hindu religious traditions by examining Hindu mythology, philosophy and society from its beginning to the present. Topics will include the law of karma, class structure, dharma, yoga, devotional traditions, liberation, modern reform movements and Hindu mythology as presented in its sacred texts, including the Vedic hymns, Upanishads, and Bhagavad-Gita. Prerequisite: one religion course and sophomore or higher status.

**355 Buddhism** (3). Alternate years. A historical and doctrinal study of Theravada and Mahayana Buddhism, focusing on Buddhist views of the human predicament and its solution, and different teachings and Buddhist practices in various regions of Asia and the West. Other topics include the historical Buddha's sermons, Buddhist psychology, cosmology, meditation, bodhisattvas, Pure Land and Zen. Prerequisite: one religion course and sophomore or higher status.

**356 Confucianism** (3). S, alternate years. An exploration of the teachings, history and range of Confucian thought and practice in East (China, Taiwan, Korea, Japan) and Southeast Asia (Vietnam, Malaysia, Singapore, Indonesia). The course examines early Confucian teachings, "Han Confucianism", "Neo-Confucianism", and "New Confucianism" for their influence on family, society, government, politics, economics, education, and art. Prerequisite: one religion course and sophomore or higher status.

### Other Courses and Seminars

**252 Introduction to Missions** (3). Alternate years. A general introduction to Christian missions in biblical and historical perspective. This course surveys the biblical and theological foundations for missions, and the church's interpretation and implementation of the task of spreading the gospel. The methods, challenges, successes, and failures of Christian missionary activity will be considered. Prerequisite: Religion 121 or 131.

**295 Christianity and Culture** (3). F This course is a critical survey of models by which God's people have defined their relationship to the world, from Biblical times to the present, with a particular emphasis on the Reformed tradition. Special attention is given to the contemporary relevance of this discussion, both in terms of ways in which different models are visible in today's world and in terms of ways that the Reformed model can be applied to present concerns. Prerequisite: biblical and theological foundations core.

**357 Religion and Education Seminar** (3). A seminar in perspectives, principles, and practices in the teaching of religion on the secondary level. This course addresses a wide range of pedagogical issues that confront the teacher

of biblical, theological, and religious materials in secondary teaching and requires a major curriculum project. Prerequisite: Education 302/303 or permission of the instructor.

**379 Research Topics in Christian Worship** (3). Participation in collaborative research on the theology, history, and practice of Christian worship. Topics are chosen in conjunction with the scholarly initiatives of the Calvin Institute of Christian Worship. Enrollment open to qualified juniors and seniors. Prerequisites: Biblical and theological foundations core and permission of the instructor.

**396 Religion Seminar** (3). S. An advanced seminar for senior majors in religion and other qualified students. This course considers significant issues in biblical, theological, and religious studies and requires a major research paper. Prerequisites: senior status, and for non-majors, three electives in religion and permission of the instructor.

**IDIS 234 The Contemporary American Religious Situation** (3). A description and analysis of current American religious developments in historical, sociological, and theological perspective. Institutional and non-institutional developments, within and outside the Judeo-Christian tradition, will be examined.

## Science Education Studies

*Professor J. Jadrich*

*Associate Professor C. Bruxvoort*

*Assistant Professor K. Bergwerff*

Courses listed under the Science Education Studies (SCES) Department are open to all Calvin students meeting the course prerequisites, although their primary intent is to serve students in the teacher education program. Students wanting both certification and the flexibility to teach any science course at the middle or high school level must major (secondary education students) or at least minor (elementary education students) in integrated science studies. More detailed descriptions of these programs can be found in the Teacher Education Program Guidebook.

### INTEGRATED SCIENCE STUDIES MINOR ELEMENTARY EDUCATION

(At least 26 semester hours)

This minor is designed for students in the elementary education program wishing to minor in integrated science.

SCES 121

SCES 122

Biology 123

Chemistry 101

Geology 112 or Geography 120

Physics 212

SCES 313 or 312

### INTEGRATED SCIENCE STUDIES MAJOR ELEMENTARY EDUCATION

(At least 38 semester hours)

One from Astronomy 110 or 111

An advisor-approved elective in life science  
 An additional advisor-approved elective in science  
 All courses required for the elementary education integrated science minor.

**INTEGRATED SCIENCE STUDIES  
 MAJOR SECONDARY EDUCATION**

This is the preferred program for all secondary education students wishing to obtain teaching certification in all the sciences. Students pursuing this major must also complete a minor in one of the four science disciplines (biology, chemistry, Earth/space science, or physics). Courses for this integrated science major are the same as those listed for the comprehensive integrated science major described below. Courses in a student's disciplinary minor often overlap with the courses required for the integrated science studies major. When they do not, students should take the sequence of courses listed for their minor, as opposed to the corresponding three courses listed in the comprehensive major described above.

**COMPREHENSIVE INTEGRATED  
 SCIENCE STUDIES MAJOR  
 SECONDARY EDUCATION**

The program for the regular integrated science major (listed above), plus a minor in a science discipline, is the recommended program for most students. Students completing the comprehensive major described directly below are not required to complete an additional minor area of study for certification. (At least 57 semester hours)

- Biology 115
- Biology 160
- Biology 161 (or 141)
- Chemistry 103
- Chemistry 104
- Chemistry 253
- Geography 120 or Geology 112
- Geology 152
- One from Astronomy 110, 111, or 211
- Physics 221 (physics minors must take physics 133)
- Physics 222 (physics minors must take physics 235)
- Physics 132
- SCES 214
- SCES 314
- SCES 359 (concurrent with Education 346)

A total of at least two semesters of any combination of the following courses: Biology 295, Chemistry 295, or Physics 195 (Two semesters of enrollment in the same course is also allowed.)

**Cognates**

Mathematics 132 or 171

**Honors**

To graduate with honors in integrated science, a student must satisfy the requirements of the college honors program; earn a minimum GPA of 3.3 within the integrated science major; complete a total of six honors courses (18 hours minimum) overall, including two courses from outside the major, four courses from among courses in the integrated science major, and no more than three courses from the same discipline; and complete a pre-approved (by the chair of the Science Education Group) honors thesis in science, science education, or another approved practicum.

**COURSES (SCES)**

**121 The Content and Nature of Science for Elementary Teachers** (4). F, S. This course uses an inquiry-based approach to integrate relevant life, physical, and earth & space science content and an examination of the nature of science for elementary teachers. The course goal is to provide prospective teachers with a portion of the content knowledge, inquiry skills, and understandings of the nature of science needed to effectively teach inquiry-based science in elementary school. Major themes and topics covered include scientific models, the particulate nature of matter, the cellular nature of living things, scientific problem solving, the nature of science, and the relationship between science and the Christian faith.

**122 Science Content and Skills for Elementary Teachers** (4). F, S. This course is the continuation of an inquiry-based investigation of relevant life, physical, and earth & space science content and scientific inquiry skills for elementary teachers. The course goal is to provide prospective teachers with a portion of the content knowledge and inquiry skills needed to effectively teach inquiry-based science from a Christian perspective. Major themes and topics covered include energy and sys-

tems, energy and interactions, changing earth and life forms, genetics, scientific testing and investigations, and the relationship between science and the Christian faith. Throughout the course a perspective of respect for God's creation, Christian stewardship, and the structure of God's creation is presented as the purpose and motivation for investigating nature and learning science. Prerequisites: SCES 121 or permission of the instructor.

**214 Communication and Learning in the Natural Sciences (3).** I. This course provides a systematic examination of communication and teaching strategies for natural science at the middle and high school level, including oral exposition, visual imagery, demonstrations, technology, and laboratory activities. Theoretical components include the underlying educational theories, scientific literacy, and the unifying themes and practices in science. Practical components include methodologies for assessment, lesson and unit development, laboratory safety, and student presentations and response. Prerequisite: At least three courses in natural science.

**312 Teaching Science in Elementary and Middle School (3).** I. A consideration of the methods, pedagogies, and strategies associated with teaching science in elementary and middle school. Curricular resources for teaching science, including the use of technology and written materials, are also examined with consideration of the criteria for their evaluation. Additional topics include assessment, benchmarks and standards, and lesson and unit development. The relationship of Christian faith to the teaching of science in the classroom is also examined. Field experiences during normal course hours are included. This course fulfills all the same requirements as SCES 313 but is intended for integrated science minors and majors. Prerequisites: Education 302 and at least four science courses or permission of the instructor.

**313 Science Teaching in Elementary and Middle School (2).** F, S. A consideration of the methods, pedagogies, and strategies associated with teaching science in elementary and middle school. Curricular resources for teaching science, including the use of technology and written materials, are also examined with consideration of the criteria for their evaluation.

Additional topics include assessment, benchmarks and standards, and lesson and unit development. The relationship of Christian faith to the teaching of science in the classroom is also examined. Field experiences during normal course hours are included. Prerequisites: Education 302 and at least one science course.

**314 Integration Methods and Pedagogies for Secondary Science Teachers (2).** S, alternate years. This course explores the integration of the natural science disciplines, issues related to the nature of science, and the methods and pedagogies used in secondary science teaching. Theoretical components include a study of the cross-disciplinary nature of science and relevant educational theories impacting the role of the teacher and students in diverse science classroom settings. Practical components include methodologies for lesson and teacher development and assessment, curriculum planning, laboratory development, and classroom management. Prerequisite: SCES 214. Prior completion of Education 302-303 is recommended.

**359 Seminar in Secondary Teaching of Integrated Science (3).** F. A course in perspectives on, principles of, and practice in the teaching of the natural sciences at the middle school and secondary level. Included are classroom management strategies, the role of the teacher, curriculum studies, readings in science education, and self-assessment strategies. This class is taken concurrently with Education 346, allowing students the opportunity to reflect on science education while engaging in classroom practice.

**390/590 Independent Study (1-4).** F, I, S, and SS. This course provides the opportunity for a student to conduct research or independent work under the direction of a science education studies advisor. Permission to enroll must be obtained from the faculty member directing the project. The requirements for credit are determined by the supervising faculty member in collaboration with the student.

### Graduate Coursework in Science Education

Graduate-level courses in science education are described in detail in the Education Department pages.

**Science Education Studies (SCES)**

**525 Alternative Frameworks and Conceptual Change in the Science Classroom** (3). SS, next offered in 2015. This course examines the nature of alternative frameworks and their correct or incorrect categorization as misconceptions, the process of conceptual change, and teaching strategies conducive towards promoting conceptual change in the science classroom. Course readings and discussions expose students to the intricacies and influence of students' prior conceptions on science learning and the process of conceptual change. Application of course content occurs as students develop lesson plans that address common science misconceptions. Prerequisites: At least one science methods course at the undergraduate or graduate level.

**526 Teaching the Nature of Science** (3). SS, next offered in 2017. This course presents historical, philosophical, sociological and psychological interpretations of the nature of science, its implications for scientific literacy, and methodologies related to implementation in the science classroom. Through discussions, readings, and scientific activities/investigations,

students will experience and consider how teachers, textbooks, and science curricula both accurately and inaccurately portray science. Students will also modify and develop lesson plans in order to more accurately represent and teach the nature of science to students. Prerequisites: At least one science methods course at the undergraduate or graduate level.

**527 Scientific Reasoning and Teaching Inquiry** (3). SS, next offered in 2016. This course investigates the role of scientific reasoning and inquiry in science, the natural development of those skills and strategies in children, and effective teaching methodologies and considerations for developing scientific reasoning and inquiry skills in students. Students explore the connections between scientific reasoning and scientific content and the transference of reasoning and critical thinking skills across the content domains of science and everyday life. Students practice their own reasoning and inquiry skills in the context of K-12 science activities and also develop lessons to foster scientific reasoning and inquiry in their own students. Prerequisites: At least one science methods course at the undergraduate or graduate level.

## Sociology and Social Work

*Professors C. Kreykes Brandsen, M. Loyd-Paige, M. Mulder (chair), T. Vanden Berg, K. Ver Beek*

*Associate Professors L. Schwander (Social Work Field Education Coordinator)*

*Assistant Professors K. Alford, J. Hill, J. Kuilema, E. Marr, R. Venema (Director of Social Work), R. Williams*

The department offers courses in sociology, social work, and anthropology. Sociology is the study of the principles of group relationships, social institutions, and the influence of groups on individuals. Urban, cross-cultural, criminology, and/or family studies are some possible groupings within sociology that majors might want to pursue. Social work is a professional program, the study of the knowledge, skills, and values necessary for generalist social work practice. Anthropology is the study of the cultural values of peoples around the world and how these values become expressed in specific behavioral patterns. Programs in the department lead to a departmental major in sociology, a minor in sociology, a major in social work leading to a Bachelor of Social Work (BSW) degree, and a minor in social work.

Sociology 151, 153, 210, 255, 395 and Social Work 250, 255, 260, and 381 satisfy requirements for the general college core as well as for major or minor programs of study in sociology and social work.



## **SOCIOLOGY MAJOR**

(34 semester hours)

Sociology 151

Sociology 255

Sociology 318

Sociology 320

Sociology 395

Six electives

## **SOCIOLOGY MINOR**

(21 semester hours)

Sociology 151

Six electives

## **SECONDARY EDUCATION**

### **SOCIOLOGY MINOR**

(21-22 semester hours)

Sociology 151

Interdisciplinary 205

Sociology 253

Sociology 304

Psychology 310

One from Sociology 255 or 318

One other Sociology elective

Students who spend a semester at the Chicago Semester or in Washington, D.C. may apply some of that work to a departmental major or minor.

For admission to the major program, a student must complete Sociology 151 with a minimum grade of C (2.0).

### **Sociology Honors**

Students wishing to graduate with honors in sociology must maintain a minimum GPA of 3.5 and must complete at least six honors courses (18 semester hours minimum). Three of these courses must be in sociology and three must be from outside of the major. Students must complete an honors thesis in sociology 395, including a public presentation of results whenever appropriate. Honors students are encouraged to participate in department seminars and colloquia when appropriate. Students must also achieve a minimum cumulative GPA of 3.5 in their major. The advisor for the sociology honors program is T. Vanden Berg.

### **Sociology Internships**

Sociology majors who have demonstrated ability in their sociology courses are invited to apply for an internship placement during their senior year. Sociology 380 offers a three-semester-hour credit experience in a professional setting delivering applied sociology or research

services. Professional settings include agencies in the fields of criminal justice, cross-cultural development, family service, gerontology, mental health, and urban planning. Internships can provide important background for later employment and graduate school. Interested students should contact M. Mulder.

## **SOCIAL WORK (BSW)**

The bachelor of social work degree is designed for students who want to prepare for a career of Christian service as a professional generalist social worker. The program is carried out in the context of the mission of Calvin, which is to offer a Christian education enriched by the insights of the Reformed heritage. Upon completion of the program, students are prepared for entry-level professional social work positions. The BSW program is accredited by the Council on Social Work Education.

Students who wish to pursue a BSW will normally apply to the director of social work by May 1 of their sophomore year. Decisions about admission to the program are made by the social work program committee and are based on the following criteria: 1) Students must have earned at least 35 semester hours of credit and either have completed or currently be enrolled in Biology 115, a second SSNA course, Psychology 151, Sociology 151, and Social Work 240 and 250, 2) Students must have a minimum grade point average of 2.5 and a minimum grade of C– in each of the courses just specified, 3) Students must have completed or be completing at least 50 hours of social work volunteer or paid service and submit a letter of reference from an appropriate supervisor, and 4) Students must submit a written personal statement, which includes information about their commitment to social work as a vocation and their relative strengths and areas for development as potential professional social workers. The BSW is composed of twelve courses and several social science cognate requirements. The social work major includes courses in social work theory, practice skills, policy analysis, and research, along with a field education experience in a human service agency. Once admitted to the BSW program, students must apply separately to field education at the beginning of their junior year. Student retention requires a minimum grade of C in all social work courses beyond 240 and 250. The core requirements include the liberal arts offerings required of all students, with the exception of a physical world course reduc-

tion, and an additional SSNA cognate. Core requirements, along with cognate and program requirements, are specified in the following model program:

<i>First year</i>	<i>Semester hours</i>
English 101	3
History of the west and the world	4
Religion 121 or 131	3
Biology 115	4
Psychology 151	3
Sociology 151	3
Language 101 and 102	8
Health and fitness	1
Foundations of information technology core	1
Developing a Christian mind (interim)	3
 <i>Second year</i>	 <i>Semester hours</i>
Philosophical foundations	3
Societal structures in NA (2nd cognate)	3
Social Work 240	3
Social Work 250	3
Rhetoric in culture	3
Language 201 and 202	8
Health and fitness	1
The arts core	3
Interim elective	3
 <i>Third year</i>	 <i>Semester hours</i>
Literature	3
Biblical/theological foundations II	3
Social Work 255	4
Social Work 260	3
Social Work 320, 350, 360, and 370	13
Health and fitness	1
Electives	3-6
 <i>Fourth year</i>	 <i>Semester hours</i>
Social work 371, 372, 380 and 381	21
Electives	3-6

A more detailed description of the BSW program is given in the Social Work Handbook, which can be obtained at the department office (Spoelhof Center).

### Social Work Honors

Students wishing to graduate with honors in social work must maintain a minimum GPA of 3.5 and must complete at least six honors courses (18 semester hours minimum). Three of these courses must be in Social Work and three must be from outside of the major. At least two of the three courses must be chosen from 300-level offerings. Students will complete an honors thesis in Social Work 381, the capstone seminar, or through an independent study (390) or another ap-

proved means. This research will be publicly presented to the Calvin community. Honors students must achieve a minimum cumulative GPA of 3.5 in the social work major. The advisor for the social work honors program is J. Kuilema.

### Social Work Field Education

All social work students must complete a 400-hour field education placement during their senior year. Field education opportunities are completed in Western Michigan, through the Chicago Semester Program or the Washington D.C. Semester. For more information, contact the Social Work Field Education Coordinator. See Social Work 380 course description for further details.

## **SOCIAL WORK MAJOR**

(40 semester hours)

Social Work 240

Social Work 250

Social Work 255

Social Work 260

Social Work 320

Social Work 350

Social Work 360

Social Work 370

Social Work 371

Social Work 372

Social Work 380

Social Work 381

## **SOCIAL WORK MINOR**

(19 semester hours)

Psychology 151 or Sociology 151

Social work 240

Social Work 350

Social Work 360

Two from Social Work 250, 260, 370, or sociology course offerings

## **COURSES**

### **Sociology (SOC)**

#### **151 Sociological Principles and Perspectives**

(3). F, S. This course is an introductory study of human social activity. The primary objectives of the course are: 1) to introduce students to origins, basic concepts, theories, and research methods of sociology, 2) to provide students with an overview of the structure, effects, promise, and limitations of our most basic social institutions, 3) to provide students with an overview of the nature of social organization, 4) to encourage students to think analytically and critically about the society in which they live, and 5) to introduce students to the traditions of Christian reflection on social life.

#### **153 Introduction to Cultural Anthropology**

(3). F This course involves the study of cultural diversity around the globe, both historically and geographically. The course introduces the foundational elements of cultural anthropology including topics of field work, cultural relativism, ethnocentrism, participant observation, ethnography, ethnology as well as major anthropological theories. The course addresses the diversity, as well as commonality of cultural systems, both in time and space, through studying major components of cultural systems, such as kinship, religion,

politics, and economics. Students are exposed to an awareness of their place within a particular cultural context, as well as their culture's place within a global and historical context.

**210 The Criminal Justice System** (3). S, alternate years. A survey and analysis of law enforcement, the courts, and corrections with special attention given to the ethical, legal, and social issues that must be confronted when these components of the traditional criminal justice system are expected to bring about social justice to offenders, victims, and society in general. Goals of restoration and moral accountability are also addressed.

#### **250 Diversity and Inequality in the United States**

(3). F, S. This course analyzes the social meanings of our various identities (i.e., race-ethnicity, class, and gender), how these identities affect our self-concepts, and the impact of these identities upon our social and societal relationships. The primary objectives of this course are to study the social definitions of gender, race, and class, to examine the impact of these social constructs on human behavior, identity, and interactions with other persons, to develop a sociological understanding of the nature of structured inequality, and patterns of discrimination, to become familiar with social-scientific methods appropriate for the studying of diversity and inequality, and to understand the promise and challenge of biblical reconciliation for seeing ourselves as image bearers of God and for easing the social tensions associated with diversity and inequality in the United States.

#### **252 African Diaspora in the Americas**

(3). F, alternate years. This course examines selected topics that have arisen in recent African Diaspora-focused research. Using a comparative model, this course investigates the experiences of Black people from a variety of societies and nations (such as Brazil, Cuba, Haiti, Jamaica, and the United State of America) in the Americas. This course begins with a presentation of a conceptual framework for understanding the African Diaspora in the Americas and includes a critical Christian perspective. Various themes will be addressed at the individual, community, and societal level using historical, ethnographic, and geo-political approaches.

#### **253 Intercultural Communication**

(3). F An examination of the anthropological principles

relating to cross-cultural communication. This examination requires an extensive comparison of the components of cultural systems and the nature of cultural dynamics. The areas of application include government, business, Peace Corps, development, and mission work, with special emphasis on the last two. Special topics include developing an appropriate attitude regarding indigenous cultures and the management of culture shock. Also cross-listed Communication Arts and Sciences 253.

**255 Social Science Statistics (4).** F, S. This course is an introduction to statistics and statistical software in one of the social sciences. Concepts and procedures taught include levels of measurement, measures of central tendency, correlation techniques, probability theory, and hypothesis tests. This course is intended to meet the core Mathematics requirement for students with declared majors in Sociology and Social Work. Sociology and Social Work majors usually take this course in the sophomore or junior year. Prerequisites: An introductory course in one of the social sciences (e.g., Sociology 151 or Psychology 151) and meeting the Calvin admission requirement in mathematics.

**302 Urban Sociology (3).** S. This course is an introduction to the purposes, problems, and prospects of cities in the United States and in other parts of the world. The theoretical portion of the course will introduce basic concepts of urban ecology and urban political economy. In the applied portion, functionalism and conflict theory will be addressed to help students to understand the interaction of social factors that produce change in cities and suburbs. The transformational theology of Abraham Kuyper will be used to focus a Christian perspective.

**303 Anthropology of Religion (3).** S, alternate years. This course takes a comparative approach to the study of religion — focusing on the universal characteristics of religious beliefs such as myth, ritual, and the sacred. Students will develop a critical understanding of the approach anthropology takes to the study of religion and will be encouraged to develop a critical understanding of that approach particularly from a faith perspective. Emphasis will also be given to grappling with the reality of personal faith in a global context of religious diversity, including the diversity in expression of Christianity.

**304 The Family (3).** S, alternate years. An intensive culturally comparative and historical analysis of the family as an institution. The contemporary courtship, marriage, and divorce patterns of the American family are also discussed.

**306 Sociology of Deviance (3).** F, alternate years. An analysis of deviant behavior: its causes, manifestations, prevention, and programs of control. Special attention is given to the role of social norms in generating as well as controlling deviance. Emphasis is put on ways in which social structures generate and label deviance. Implications are drawn for various institutions, particularly the school and the church.

**308 Demography and World Population Problems (3).** F, alternate years. This introduction to demographic analysis of society includes a consideration of the major demographic theories of population growth and how these contribute to an understanding of population explosion, a review of how the socio-cultural dimension of human society affects major sources of population growth (fertility, mortality, migration, and how variations in these reciprocally affect society), and an analysis of the causes and consequences of population size, distribution, and composition for human society.

**311 Religion and Society (3).** F, alternate years. The course will focus on recognizing the social aspects of religion and thinking critically about what influences the ways in which people practice their faith and what role faith plays in shaping human behavior. Particular attention is paid to the North American experience of Christianity. This course will examine beliefs, practices, organizations, and cultures from a sociological perspective, looking as well at the historical and philosophical underpinnings of the perspective and what that means for our study of religion.

**314 Contemporary Social Problems (3).** F, S. The course will begin with a theoretical examination of social problems generally. Various contemporary social problems will be discussed with one selected for major emphasis.

**315 Sociology of Sport (3).** S, alternate years. A study of the social and social-psychological dynamics of sports in modern society. Areas receiving special attention are youth sports, interscholastic sports, and professional sports. Emphasis is put on describ-

ing and understanding sports participants and observers and the relationship of sport as an institution to the rest of social structure.

**316 Social Gerontology** (3). S alternate years. A cross-cultural examination of how various societies react toward the elderly. Specific substantive issues included are: Discrimination against the elderly, familial relationships, social security, nursing home services, housing needs, and employment opportunities. There is an analysis of proposed changes in American society which would give assistance to older adults.

**317 Death, Dying, and Bereavement** (3). S alternate years. This course investigates death-related behavior in America and cross-culturally through the lens of various sociological perspectives, seeking to understand patterns of social interaction surrounding and giving meaning to dying, death, and bereavement. Topics include: Death meanings and anxiety, religion and death-related customs, the dying process, hospice as a social movement, bioethical and legal issues, the funeral industry and death rituals, and social understandings of the bereavement process.

**318 Sociological Theory** (3). F. An assessment of sociological theory in terms of its historical development and current role in understanding human behavior. Particular attention is given to the function of theory in the research process. Direction is given to the student in the formulation of sociological hypotheses from data. Prerequisite: Sociology 151.

**319 Special Problems and Current Issues in Criminal Justice** (3). S. Concerted attention will be paid to a major criminal justice related issue or problem, focusing particularly on those for which a Reformed Christian sociological perspective is most strategic. Confronting the drug problem, and white collar crime are illustrations of these issues. Course may be taken two times in the study of different issues and problems for a total of 6 semester hours.

**320 Social Research** (3). F, S. An assessment of the nature of the research process as applied to the study of theoretical problems in social science. Students are guided in designing and conducting a research project, involving definition of the problem, consideration of appropriate methods, and the collection and analysis of data. Prerequisites: Sociology 151 and 255.

**380 Internship in Sociology** (3). S. Students are placed in an internship setting related to an area of sociological practice or research. Students work eight hours per week under the direction of an on-site supervisor and participate in regular seminar meetings conducted by the college instructor. Internship experiences will assist students in integrating previously acquired sociological knowledge and research skills in a particular setting. Each student will author a project that communicates learning throughout the internship. Prerequisites: Senior sociology major, completion of Sociology 151, 255, and completion of or concurrent registration in Sociology 318 and 320.

**390 Independent Study.**

**395 Sociology Integrative Seminar** (3). S. This course provides students with an opportunity to re-visit, at a more advanced level, the basic assumptions and concepts of the discipline of sociology, to explore the bearing of Christian faith, in particular a Reformed perspective, on the shaping of scholarly research, to consider what it means to practice sociology, and, in addition, students are challenged to synthesize, integrate, and assess what they have learned in sociology and to reflect on the role and contributions of the discipline in understanding current social issues in American culture. Prerequisites: biblical foundations I or theological foundations I, developing a Christian mind, philosophical foundations, Sociology 151, 255, and 318.

**IDIS 205 Societal Structures and Education** (3). F, S. An examination of the interaction between education and the other systems and institutions (e.g., political, economic, and cultural) that shape society. This course will examine how education is shaped by and is reshaping these systems and institutions. Particular attention will be given to the impact of race, class, and gender on schooling and society. Community-based research projects will challenge students to examine these issues in real-life contexts as well as introducing them to social science research methodology. Christian norms, such as social justice, will shape this critical analysis of the interaction between education and society. This class is appropriate for all students who are interested in education and society and meets a core requirement in the societal structures category. Credit for this course may be applied towards a sociology major.

**Social Work (SOWK)**

**240 Introduction to Social Work and Social Welfare** (3). F, S. An introduction to the profession of social work and the field of social welfare. Attention is given to the development of social welfare as a social institution, including the development of philosophies, values, and attitudes, which influence the theory, policy, and practice of social work. Practice settings, professional roles, and value and ethical issues are also considered to increase awareness of the profession and aid students in considering social work as a career.

**250 Diversity and Inequality in the United States** (3). F, S. This course analyzes the social meanings of our various identities (i.e., race-ethnicity, class, and gender), how these identities affect our self-concepts, and the impact of these identities upon our social and societal relationships. The primary objectives of this course are to study the social definitions of gender, race, and class, to examine the impact of these social constructs on human behavior, identity, and interactions with other persons, to develop a sociological understanding of the nature of structured inequality, and patterns of discrimination, to become familiar with social-scientific methods appropriate for the studying of diversity and inequality, and to understand the promise and challenge of biblical reconciliation for seeing ourselves as image bearers of God and for easing the social tensions associated with diversity and inequality in the United States.

**255 Social Science Statistics** (4). F, S. This course is an introduction to statistics and statistical software in one of the social sciences. Concepts and procedures taught include levels of measurement, measures of central tendency, correlation techniques, probability theory, and hypothesis tests. This course is intended to meet the core Mathematics requirement for students with declared majors in Sociology and Social Work. Sociology and Social Work majors usually take this course in the sophomore or junior year. Prerequisites: An introductory course in one of the social sciences (e.g., Sociology 151 or Psychology 151) and meeting the Calvin admission requirement in mathematics.

**260 Global Issues and Perspectives** (3). F, S. This course explores the meaning of global citi-

zenship and how it relates to an international perspective on social work action. The course incorporates an understanding of the models and perspectives of faith-based human services using professional practice frameworks, anchored in social work values and concepts including social justice, human relationships, and advancement of human rights and civil rights. The course critically looks at specific social justice issues facing the global community and the field of international social work such as international migration, human trafficking, international adoption, world poverty, and public health. It will provide students with a better understanding of global issues and their impact on practice and policy at all levels. This course meets global and historical core.

**320 Social Research** (3). F, S. See Sociology 320 for description. Prerequisites: Sociology 151 and Social Work 240 and 255.

**350 Human Behavior and the Social Environment** (4). F, S. A study of the person in her/his environment using a systems-based ecological model of human behavior. Knowledge about persons as biological, psychological, social, cultural, and spiritual creatures is integrated as the "person" is followed through the life cycle. Theoretical frameworks from prerequisite courses are integrated to enable students to assess micro and macro influences on human behavior. Prerequisites: Biology 115, English 101, Psychology 151, Sociology 151, and Social Work 240 and 250.

**360 Social Welfare Policy Analysis** (3). F, S. A value-critical analysis and evaluation of social welfare policies and programs as responses to defined social problems in their historical, political, and economic contexts. Students examine the role of the direct provider of social services as a policy practitioner. Prerequisites: history core, SSNA core and cognate, and Social Work 240.

**370 The Helping Interview** (3). F, S. A course to teach students the basic skills necessary to conduct a helping interview. Students participate in videotaped role plays. The course also contains contextual material about ethical issues, a Christian view of relationship and interviewing, and interviewing people from different backgrounds. Prerequisites: Social Work 240 and 350 (or concurrent enrollment).

**371 Generalist Practice with Individuals, Families, and Groups** (4). F A study of generalist social work practice within an ecological and problem solving context. This course focuses on practice skills, interventions, and issues with individuals, families, and groups. Special attention is given to working with clients from different backgrounds. Prerequisite: Social Work 320, 350, 360, and 370.

**372 Generalist Practice with Organizations and Communities** (3). F; S. This course explores generalist social work practice with organizations and communities with an emphasis on how social workers plan and implement change at the macro level. This course examines both the historical context of social work with organizations and communities as well as systems and strategies for engagement, assessment, planning, implementation and evaluation at multiple levels. Prerequisite: Social Work 320, 350, 360, and 370.

**380 Social Work Field Education** (5-F; 5-S; or 10-F; or 10-S). F, I, and S. Students are placed in a community agency (minimum of 400 hours) under the supervision of a professional social worker. Students will engage in several social work roles and activities to continue to develop the knowledge, skills and values of generalist social work practice. Prerequisites: Previous or concurrent enrollment in Social Work 371, admission to the BSW program, and satisfactory completion of the field education admission process.

**381 Social Work Capstone Seminar** (4). F; S. This course requires students to integrate the content of courses in the social work major and a Christian worldview. Students draw on core concepts and principles from the profession and from the Christian faith as they discuss issues associated with professional role and identity. Prerequisites: Admission to the BSW program, and satisfactory completion of the practicum admission process.

**390 Independent Study.**

# Spanish

Professors S. Clevenger, E. Miller, M. Pyper (chair), C. Slagter, D. TenHuisen, D. Zandstra  
Associate Professors A. Tigchelaar  
Assistant Professors S. Lamanna, M. Rodríguez, O. Shkatulo

## Core requirements

Students must demonstrate competency in a world language that is equivalent to two years of study in college. Core competence in Spanish can be demonstrated by successful completion of one of the following:

- Spanish 202 or 203
- Core-level Spanish Semester in Spain (fall, alternate years)
- Four years of high school Spanish (minimum grade of C each semester)
- Departmental 202 exemption exam

## Major and minor requirements

A minimum grade of C (2.0) in Spanish 301 is required as a prerequisite for any concentration in Spanish. Programs for students wishing to major or minor in Spanish are worked out individually with the appropriate departmental advisor.

C. Slagter, and D. Zandstra are the advisors for students in Spanish secondary education. M. Pyper, S. Lamanna, and M. Rodríguez are the advisors for students in the elementary education programs. M. Pyper advises the bilingual and ESL minors.

### SPANISH MAJOR

(at least 31 semester hours)

- Spanish 301
- Spanish 302
- Spanish 308
- Spanish 309
- Spanish 340 or 341
- Spanish 370
- Spanish 395
- Advisor-approved Spanish semester abroad
- Advisor-approved electives to reach a minimum of 31 hours

### SPANISH MINOR

(at least 20 semester hours)

- Spanish 301
- Spanish 302
- Spanish 308
- Spanish 309
- Advisor-approved Spanish interim or semester abroad
- Advisor-approved electives to reach a minimum of 20 hours

### SECONDARY EDUCATION MAJOR IN SPANISH

(at least 34 semester hours)

- Spanish 301
- Spanish 302
- Spanish 308
- Spanish 309
- Spanish 340

Spanish 370 or 395

Interdisciplinary 357

Interdisciplinary 359

Advisor-approved Spanish semester abroad

Advisor-approved electives to reach a minimum of 34 hours

### SECONDARY EDUCATION MINOR IN SPANISH

(at least 23 semester hours)

Spanish 301

Spanish 302

Spanish 308

Spanish 309

Spanish 340

Interdisciplinary 357

Advisor-approved Spanish interim or semester abroad

Advisor-approved electives to reach a minimum of 23 hours.

### K-12 SECONDARY EDUCATION MAJOR IN SPANISH

(at least 37 semester hours)

Spanish 301

Spanish 302

Spanish 308

Spanish 309

Spanish 340

Spanish 370 or 395

Interdisciplinary 356

Interdisciplinary 357



Interdisciplinary 359  
Advisor-approved Spanish semester abroad  
Advisor-approved electives to reach a minimum of 37 hours  
*Note: For the K-12 Secondary endorsement, the field experience for Education 302/303 is generally in an elementary school.*

**ELEMENTARY EDUCATION  
MAJOR IN SPANISH**

(at least 31 semester hours)  
Spanish 301  
Spanish 302  
Spanish 308  
Spanish 309  
Spanish 340  
Spanish 370 or 395  
Interdisciplinary 356  
Advisor-approved Spanish semester abroad  
Advisor-approved electives to reach a minimum of 31 hours

**ELEMENTARY EDUCATION  
MINOR IN SPANISH**

(at least 23 semester hours)  
Spanish 301  
Spanish 302  
Spanish 308  
Spanish 309  
Spanish 340  
Interdisciplinary 356  
Advisor-approved Spanish interim or semester abroad  
Advisor-approved electives to reach a minimum of 23 hours.

**K-12 ELEMENTARY EDUCATION  
MAJOR IN SPANISH**

(at least 34 semester hours)  
Spanish 301  
Spanish 302  
Spanish 308  
Spanish 309  
Spanish 340  
Spanish 370 or 395  
Interdisciplinary 356  
Interdisciplinary 357\*  
Advisor-approved Spanish semester abroad  
Advisor-approved electives to reach a minimum of 34 hours

\* *For the K-12 Elementary endorsement, IDIS 357 requires a secondary field placement in addition to the regular course work.*

**BILINGUAL EDUCATION MINOR**

(at least 21 semester hours)  
Spanish 310  
Spanish 340  
English 372  
English 375  
Interdisciplinary 205  
Interdisciplinary 301  
Education 303

*Note: The Bilingual Education minor must be combined with the Spanish major, and IDIS 301 is best taken concurrently with Education 303.*

**ENGLISH AS A SECOND LANGUAGE  
EDUCATION MINOR**

(at least 22 semester hours)  
Speech Pathology and Audiology 216  
English 370 or Spanish 340  
English 372  
English 375  
Interdisciplinary 356 (elementary) or 357 (secondary)  
Interdisciplinary 301  
Education 303

*Notes: Students with the secondary education ESL minor should consider an English major (a 2-course overlap between major and minor is allowed). IDIS 301 is best taken concurrently with Education 303. Students must complete Calvin's foreign language core requirement.*

**ENGLISH AS A SECOND LANGUAGE  
NON-EDUCATION MINOR**

(at least 22 semester hours)  
Speech Pathology and Audiology 216  
English 370 or Spanish 340  
English 372  
English 375  
Interdisciplinary 301  
Sociology 253  
An advisor-approved elective

**Information for education students**

Students interested in teacher education programs in Spanish, Bilingual Education, or ESL should meet with the appropriate Spanish Department advisor as soon as possible to declare their interest in a particular program and to map out their four-year plan.

All students in the Spanish education and bilingual programs must successfully complete proficiency exams in both oral and written Spanish prior to applying for the student teacher internship (junior year). Information on the scheduling and cost of each test is

available from the Spanish Department.

The student teacher internship in secondary Spanish is available only in the spring semester.

### Credit/exemption exams

Credit and/or exemption exams in the department will be given four times each year on the same dates as the proficiency examinations. Credit exams are not available for SPAN 201 or 202.

### Off-campus programs

**Spanish Studies in Spain (STSP).** Fall Program. During the fall semester of odd numbered years, Calvin offers a program in Oviedo, Spain, for students at all levels. Beginning Spanish students complete courses to satisfy the college core language requirement, and intermediate/advanced students take courses toward completing the core language requirement and/or the major or minor in Spanish. All students complete the Cross-Cultural Engagement core requirement. All students live individually with Spanish families, participate in educational excursions and attend classes on the campus of the Universidad de Oviedo. The director for fall 2015 is O. Shkatulo.

**Spanish Studies in Spain (STSP).** Spring Program. During the interim and spring semester of each year, Calvin offers an advanced Spanish program in Oviedo, Spain. Students take 15-20 semester hours towards a Spanish major or minor. All students live individually with Spanish families, participate in educational excursions, and attend classes on the campus of the Universidad de Oviedo. Prerequisite: Spanish 301. The director for this program is E. Miller.

**Spanish Studies in Peru (STPE).** From mid-August through the fall semester, participants in this advanced program study on the campus of the Universidad Católica San Pablo in Arequipa, Peru. Students take 12-17 hours toward a Spanish major or minor; they enroll in both Calvin and San Pablo courses, live individually with local families, and participate in educational excursions and optional extracurricular activities. Prerequisite: Spanish 301. The director for this program is D. Zandstra.

**Spanish Studies in Honduras (SPHO).** During interim and spring semester, Calvin offers an advanced Spanish program for majors and

minors in Tegucigalpa, Honduras. Students take 15-20 hours toward a Spanish major or minor in courses that combine intensive study of Spanish with an exploration of the meaning of faith in the developing world. All students live individually with Honduran families, participate in educational excursions, and attend classes on the campus of the Universidad Pedagógica Nacional Francisco Morazán. Prerequisite: Spanish 301. The director for this program is M. Rodríguez.

**Justice Studies in Honduras (STHO).** During the fall semester, this program in International Development Studies takes place in Tegucigalpa, Honduras. Students take courses in development studies (in English), as well as a language course for Spanish credit, normally from the following offerings: Spanish 101 or 201, or a Latin American culture course. The Spanish advisor for this program is M. Rodríguez.

**Spanish Interim in Yucatan, Mexico (SPAN W80).** During this interim, students spend three weeks immersed in Mexican culture and Spanish language while living with families in Merida, Yucatan. Students participate in excursions to Mayan ruins, various lecture classes, and religious and cultural events. Prerequisite: Spanish 201 and permission of the program director, S. Lamanna.

## COURSES (SPAN)

### Core Language Courses

101 **Elementary Spanish I** (4). F. An introductory course in oral and written Spanish.

102 **Elementary Spanish II** (4). S. A continuation of Spanish 101.

121/122 **Intermediate Spanish** (4, 3). F and I. A two-course sequence during the fall semester and January interim designed for students who have had two years of Spanish in high school, but who are not sufficiently prepared for 201. These students take Spanish 202 in the spring to finish the foreign language core requirement.

201 **Intermediate Spanish I** (4). F, SS. Review of essential grammatical structures and further training in spoken and written Spanish. Cultural and literary readings. Prerequisite: Spanish 102 or equivalent.

**202 Intermediate Spanish II** (4). S, SS. This final core class is a continuation of Spanish 201 or 121/122.

**203 Accelerated Intermediate Spanish** (4). F This is a final core course in Spanish and a preparation for courses in a major or minor. It is intended specifically for students who have successfully completed at least three years of high school Spanish. The course includes an accelerated review of essential structures and vocabulary, and also features aspects of culture, and classroom and community opportunities to use spoken Spanish. Students explore relevant biblical themes and see examples of faith practice in the Hispanic World.

### Language and Linguistics Courses

**301 Advanced Grammar, Composition, and Conversation I** (3). F, S. This introduction and gateway to the major or minor concentration focuses on the improvement of speaking and writing skills through vocabulary acquisition and the honing of grammatical accuracy. Extensive practice in oral and written communication. A minimum grade of C (2.0) in Spanish 301 is required as a prerequisite for any concentration in Spanish. An honors section of 301 is offered in the fall semester. Prerequisite: Spanish 202, 203 or equivalent.

**302 Advanced Grammar, Composition, and Conversation II** (3). F, S. A continuation of Spanish 301.

**340 Spanish Phonology and Dialectology** (3). F An introduction to Spanish linguistics, concentrating on the sounds of Spanish (phonetics and phonology), with appropriate pronunciation practice and contrasts with English pronunciation. Included are units on the history of the Spanish language and the major dialects spoken today. Prerequisite: Spanish 301.

**341 Spanish Syntax and Sociolinguistics** (3). S. An examination of the differences and similarities between English and Spanish morphology, syntax, and semantics, in order to improve students' communication skills and to generate a deeper understanding of the complex nature of the human language system. Specific connections will be made to first and second language acquisition, bilingualism, Spanish/English dialects, sociolinguistics, psycholinguistics, and language disorders. Prerequisite: Spanish 302.

### Culture and Literature Courses

**308 Introduction to the Hispanic World I** (3). F This course introduces students to major developments of the Hispanic World from antiquity through the Enlightenment. Discussions center on the relationship of major literary and artistic works to economic, political, religious, and social developments in the Iberian Peninsula and the Castilian colonies in the Americas. This course, normally the first in a sequence of two, prepares students for advanced-topics courses. An oral presentation and a research paper are required. Prerequisite: Spanish 301. (Global and Historical Studies core)

**309 Introduction to the Hispanic World II** (3). S. This course introduces students to major developments of the Hispanic World from the independence of the Spanish American colonies to the present day. Discussions center on the relationship of major literary and artistic works to economic, political, religious, and social developments in Spain and Spanish America. In addition, students develop their skills in reading and evaluating literature in a second language through representative texts, and they sharpen their skills in critical writing and analysis. This course, normally the second course in a sequence of two, prepares students for advanced-level culture and literature courses. Oral presentations and research paper are required. Prerequisite: Spanish 308, or permission of the instructor. (Literature core)

**310 Hispanic Culture in the United States** (3). S. A study of the history and culture of Hispanic groups in the United States, their political, social, and religious institutions, and their value systems. The course is designed to assist students in understanding the cultural contributions of Hispanics within the broader U.S. culture. Reading materials include literary and non-literary sources. Prerequisite: Spanish 301.

**370 Advanced Topics** (3). F, S. Through varied disciplinary emphases and diverse media such as film, music, art, written text, and community contact, this course fosters a deeper understanding of a specific theme relevant to the Hispanic World. Taught in Spanish. Prerequisite: Spanish 308 or 309. Students may repeat this course if the topic is different.

390 **Independent Study.** F, I, S, and SS. Prerequisite: Permission of the department chair.

395 **Palabra y mundo: The Word and the World** (3). F, S. As the capstone in the Spanish departmental major, this integrative studies course provides an opportunity for students to revisit, at a more advanced level, the literature, cultures, history, and language studied during their time at Calvin and to explore ways in which their education has prepared them to engage with contemporary international culture. Students examine and critically reflect on the ethical, religious, and vocational implications of what they have learned. Prerequisites: DCM, Philosophical Foundations, Biblical or Theological Foundations I, Spanish 308 and 309, and at least junior standing.

### Spanish for the Professions

320 **Business Spanish** (3). I, alternate years. An introduction to the terminology and standard forms of oral and written communication in Spanish relating to the fields of business and economics. This course also considers the cultural and economic context of business practices in the Hispanic world. Prerequisite: Spanish 301. Not offered 2016.

W83 **Spanish for Healthcare Professionals** (3). I, alternate years. An introduction to the terminology and cultural context of oral and written communication in Spanish relating to the field of medicine. The course helps students develop language skills and increases their cultural awareness of health care practices and needs for the patient or client of Hispanic background. Prerequisites: Spanish 202/203, or permission of instructor. Not offered 2016.

### Education Courses

IDIS 301 **Introduction to Bilingual and ESL Education** (3). F This course focuses on both bilingual and ESL education. Students learn to recognize linguistic, cognitive, affective, and social factors that influence the acquisition of a second language. Course topics include teaching in content areas, classroom methods, curriculum design, and assessment. For students in the education program, concurrent registration in Education 302-303 is strongly recommended. Field experience required for non-education students (and edu-

cation students not in Education 302-303). One evening field observation required.

IDIS 356 **Introduction to Elementary World-Languages Pedagogy** (3). F Theory and practice of teaching world languages in the elementary school. Study of second language acquisition, methodologies, curricula, and programs. Off-campus field experience and observations required. Should be taken in the junior or senior year, prior to the student teacher internship. Required for Elementary and K-12 certification in world languages including ESL. Prerequisite: completion of or concurrent registration in Education 302-303.

IDIS 357 **Introduction to Secondary World-Languages Pedagogy** (3). F An introduction to the major principles and practices of teaching world languages, offering a study of various methodologies and the major controversies associated with them. The course explores how a Christian approach to education affects second-language pedagogy and how this pedagogy interacts with the language learner's personal growth. It also introduces the prospective educator to the teaching of the basic skills, to issues in evaluation and assessment, and to the use of technologies in the language classroom. This course should be taken in the junior or senior year, prior to the student teacher internship. Required for secondary or K-12 certification in world languages including the ESL secondary minor. Prerequisite: completion of or concurrent registration in Education 302-303. NOTE: For the Elementary K-12 endorsement, IDIS 357 requires a secondary field placement in addition to the regular course work.

SPAN 358 **Aiding in the Spanish Language Classroom** (3). I. Students plan and facilitate small group sessions for Spanish 122. Morning activities include meeting with other aides and the professor, observing master teachers, and aiding master teachers in teaching. Afternoon activities include leading sessions with Spanish 122 students and planning lessons, materials, and activities under the supervision of the professor. Students will be evaluated based on their competency in the Spanish language, professional evaluations of teaching sessions and lesson plans/materials, participation in class discussions, daily journals, and an oral presentation. Prerequisite: Spanish 302 with a grade of B+ or better and permission of the instructor.

IDIS 359 **Seminar in Secondary World-Languages Pedagogy** (3). S. A seminar reinforcing the major principles and practices of world-languages pedagogy on the secondary level for students during their student teacher internship (Education 346). This course provides op-

portunities for collaborative work on putting theoretical and pedagogical matters of immediate concern into a practical framework. Prerequisites: Education 302-303 and successful completion of departmental proficiency exams.

# Speech Pathology and Audiology

Professors P. Goetz, J. Vander Woude (chair)

Associate Professors B. Kreisman,

Assistant Professors H. Koole, B. Oommen

The Speech Pathology and Audiology (SPAUD) department offers a 4-year bachelor's degree in speech pathology and audiology, and a 5-year bachelor's to master's program in speech pathology.

## UNDERGRADUATE ADMISSIONS

### Undergraduate Admission to the SPAUD Program

Students who wish to enter the professions of Speech Pathology or Audiology may qualify for the degree of Bachelor of Arts in speech pathology and audiology and then apply to graduate programs in either area. Admission into graduate programs in audiology or speech pathology is competitive. Students who wish to become audiologists should apply to accredited graduate programs at other institutions during the fall of their senior year. Students who wish to become speech-language pathologists may apply to Calvin's bachelor's-to-master's (BA-MA) in their junior year or they may apply to other accredited graduate programs during the fall of their senior year.

### Admission for Transfer Students to the BA SPAUD Program

Undergraduate students who have transferred to Calvin from another college or university will follow the regular admission process, if they have completed at least two semesters of full time academic work at Calvin by the time they apply for admission to the program. Most transfer students can expect to be full-time at the undergraduate level for at least four semesters before beginning the master's program.

### Retention Requirements for all Undergraduate SPAUD Majors

Students must earn at least a 3.0 grade point average (GPA) every semester across all courses. If a student earns below a 3.0 GPA in any one semester, the student will be placed on probation and must earn a 3.0 GPA the following semester. Students may earn below a 3.0 GPA only one time during their tenure at Calvin College. Students may retake SPAUD courses to improve their GPA; however, only one retake per course is allowed. Students must also meet the essential functions required to practice as a speech-language pathologist, as outlined in the SPAUD Handbook located online.

## GRADUATE ADMISSIONS

Students applying for admission to the Speech Pathology MA program should take note of the following policies:

- Prerequisite SPAUD courses must have been completed within the last seven years.
- Preference will be given to Calvin applicants who have completed or will complete all prerequisite courses at Calvin, unless advisor approval has been granted.
- Enrollment in the MA program is also contingent upon successful completion of a criminal background check, fingerprint check, and drug screen.

It is important to note that completion of the SPAUD courses and achievement of the minimum criteria does not guarantee admission into the MA or any other graduate program. Enrollment in the MA Program is limited and thus the admission process is selective.

### Early Admission Process to the BA-MA Program

High school graduates interested in the Speech Pathology and Audiology (SPAUD) BA-MA Program are eligible for early admission to the SPAUD major at Calvin College. Students must have met the following criteria:

- A composite ACT of equal to or greater than 28 or an SAT critical reading plus math

- score of equal to or greater than 1260
  - A high school GPA of 3.8 or higher for US citizens
  - Average marks of 91% or higher from a Canadian high school
  - Students must specify a SPAUD major on their Calvin College application and submit their final Early Admission qualifying ACT or SAT score on or before May 1 prior to their freshman year.
  - In order to maintain early admission status, an early admitted Calvin student must have:
    - Earned at least an B in all SPAUD courses at Calvin
    - Earned a 3.0 GPA every semester
    - Met the essential functions required to practice as a speech-language pathologist (see Essential Functions Requirements in the SPAUD student handbook for more information)
    - Successfully completed a criminal background check, fingerprint check, and drug screen before entering the Speech Pathology MA program.
- Failure to meet these requirements means that students will lose early admission status.

### **Regular Admission to the MA Program**

Application to the MA Program for regular admission of undergraduate students at Calvin normally occurs during the junior year. Applications are due on February 15. Applicants who submit after the deadline will be considered on a space available basis only. Application forms are available in the SPAUD Department office. In order to apply to the SPAUD program, Calvin students must have:

- At least junior standing at the application due date.
- Completed the following prerequisite courses or be enrolled in at the application due date: SPAUD 210, 215, 216, 217, 218, 311, 344, 345. Biology 115. Statistics 143, and a Physics or Chemistry course.
- A minimum overall cumulative grade point average (GPA) of 3.0 at the application due date.
- Met the essential functions required to practice as a speech-language pathologist (see Essential Functions Requirements in the SPAUD student handbook for more information).

### **Admission for Post-BA Students**

Prospective graduate applicants with a degree or equivalent coursework in speech pathology and audiology or with degrees in other disciplines/areas of study may apply to the Speech Pathology MA program only. Preference is given to Calvin undergraduate students in the bachelor's-to-master's degree program; however, a limited number of seats may be available for post-baccalaureate students. Please note that simply meeting the criteria is not a guarantee of admission. As is the case with most graduate programs in speech pathology, admission is highly competitive. Admission to the Master's program only is dependent on the criteria listed below.

- Graduation from a regionally accredited undergraduate college or university.
- A minimum overall GPA of at least a 3.0 and a minimum GPA of 3.0 (no exceptions).
- Three letters of recommendation from persons familiar with your academic and/or professional abilities.
- A personal statement that addresses reasons for pursuing an advanced degree in speech pathology, professional objectives, and why Calvin is a good fit for your graduate experience and your future profession.
- Successful completion (with at least a 3.0 GPA) of the undergraduate prerequisites or their equivalents. Descriptions of courses are located at [www.calvin.edu/academic/cas/academics/speech-pathology/academics/](http://www.calvin.edu/academic/cas/academics/speech-pathology/academics/).

Applicants who are admitted to the graduate program but have inadequate undergraduate preparation in speech pathology are expected to enroll in the undergraduate prerequisite courses first to prepare them for graduate study. All applicants must meet required undergraduate course prerequisites before enrolling in graduate classes. See below for course listings.

SPAUD 101: Introduction to Speech Pathology and Audiology  
 SPAUD 210: Anatomy and Physiology of the Speech Mechanism  
 SPAUD 216: Phonetics  
 SPAUD 217: Speech Science  
 SPAUD 218: Hearing Science  
 SPAUD 311: Child Language Development  
 SPAUD 343: Neuroscience of Communication  
 SPAUD 344: Audiology  
 SPAUD 345: Aural Rehabilitation  
 SPAUD 370: Introduction to Clinical Practicum  
 Developmental Psychology: Lifespan  
 Physical Science course, preferably a Physics or Chemistry course  
 Biology course  
 Statistics course  
 All applicants must also meet the retention requirements as listed above.

**How to Apply as a Post-Baccalaureate Student:**

Applicants must submit the following items online at CSDCAS ([www.csdcas.org](http://www.csdcas.org)):

- Official transcripts from every college or university attended; if currently attending college, most recently completed semester grades must be included.
- Three letters of recommendation that address your potential for success in the graduate program.
- A personal statement that addresses:
  - Why you decided on a career in speech-language pathology
  - Your future professional objectives
  - Why Calvin College, as a faith-based institution, is a good fit for your graduate education and your future profession.

All application materials (including official transcripts) are due no later than February 15 to [www.csdcas.org](http://www.csdcas.org) for entry the following fall semester. If accepted, applicants will be directed to the Admissions Office for application to the college.

**SPEECH PATHOLOGY AND AUDIOLOGY MAJOR BA PROGRAM**

(38 semester hours)

SPAUD 101  
 SPAUD 210  
 SPAUD 216  
 SPAUD 217  
 SPAUD 218  
 SPAUD 311  
 SPAUD 343  
 SPAUD 344  
 SPAUD 345  
 SPAUD 370  
 SPAUD 384  
 SPAUD 385

**Cognates**

Biology 115  
 English 370  
 Statistics 143  
 Psychology 201  
 Physics or Chemistry course  
 One from English 373, 374, 375

**SPEECH PATHOLOGY AND AUDIOLOGY MAJOR (BA-MA PROGRAM)**

(101-105 semester hours)

SPAUD 101  
 SPAUD 210  
 SPAUD 216  
 SPAUD 217  
 SPAUD 218  
 SPAUD 311  
 SPAUD 343  
 SPAUD 344  
 SPAUD 345  
 SPAUD 370  
 SPAUD 501  
 SPAUD 503  
 SPAUD 504  
 SPAUD 505  
 SPAUD 506  
 SPAUD 508  
 SPAUD 510  
 SPAUD 512  
 SPAUD 515  
 SPAUD 520



SPAUD 521  
 SPAUD 522  
 SPAUD 523  
 SPAUD 524  
 SPAUD 530  
 SPAUD 531  
 SPAUD 532  
 SPAUD 540  
 SPAUD 541  
 SPAUD 542  
 SPAUD 595 (optional)  
 SPAUD 599

### Cognates

(21 semester hours)

Biology 115  
 English 370  
 Statistics 143  
 Psychology 201  
 Physics or Chemistry course  
 One from English 373, 374, 375

### SPEECH PATHOLOGY MA PROGRAM

SPAUD 501  
 SPAUD 503  
 SPAUD 504  
 SPAUD 505  
 SPAUD 506  
 SPAUD 508  
 SPAUD 510  
 SPAUD 512  
 SPAUD 515  
 SPAUD 520  
 SPAUD 521  
 SPAUD 522  
 SPAUD 523  
 SPAUD 524  
 SPAUD 530  
 SPAUD 531  
 SPAUD 532  
 SPAUD 540  
 SPAUD 541  
 SPAUD 542  
 SPAUD 595 (optional)  
 SPAUD 599

### COURSES

#### Speech Pathology and Audiology (SPAUD)

**101 Introduction to Speech Pathology and Audiology** (3). F, S. A general introduction to speech-language pathology and audiology. These rapidly growing interdisciplinary pro-

fessions are devoted to helping individuals manage or overcome communication challenges. Communication is a God-given gift that allows us to be social beings. When people have difficulty communicating, it affects almost all aspects of their lives. Students will gain a general understanding of prevention, evaluation, and rehabilitation issues for persons with speech, language, and hearing disorders in clinical and educational settings.

#### 210 Anatomy and Physiology of the Speech, Hearing, and Language Mechanisms

 (4).

F. A study of the anatomic and physiologic bases for the development and use of speech, language, and hearing. The course focuses on the central and peripheral auditory mechanisms of the human body, and on the respiratory, phonatory, and articulatory mechanisms required for speech production.

**216 Phonetics** (4). F. A study of phonetic theories and the use of International Phonetic Alphabet symbols in analyzing, categorizing, and transcribing the sounds of the world's languages, focusing on American English. The course emphasizes understanding the processes involved in the production of specific phonemes. The laboratory section of the course focuses on developing students' skills in broad and narrow transcription.

**217 Speech Science** (3). F. An introduction to speech physiology and the instrumentation used to measure physiologic aspects of speech. Topics include a basic understanding of the acoustic theories of speech production, experience in acoustic instrumentation, recording, and analysis equipment and procedures, an overview speech perception, and clinical applications of the speech science theories, instrumentation, and procedures.

**218 Hearing Science** (3). S, SS (online). An introduction to hearing and hearing science. Topics include the physics of sound, the anatomy and physiology of the human auditory system, and the psychophysics of human hearing. Prerequisite: SPAUD 217: Speech Science.

**311 Child Language Development** (3). F, S. An examination of early language development research in phonology, morphology, syntax, semantics, and pragmatics. Theories of language acquisition and implications for

practice are examined. Particular attention is given to the role of adults in language development and to the relationship between language development and cognitive development. Also listed as Education 311.

**343 Principles of Communication Neuroscience (3).** I. This course provides a thorough understanding of nervous system anatomy and physiology as it relates to speech, language, and hearing. Principles of molecular biology, systems theory, neuromuscular control, somatosensory processing and complex cognitive function are included. Select communication disorders are discussed to highlight the effects of breakdowns in nervous system function during speech, language, and hearing processes.

**344 Audiology (3).** F The study of the classification of hearing disorders and the behavioral and electrophysiological measurement of hearing, including subjective and objective testing procedures. Prerequisites: SPAUD 210, 217 and 218.

**345 Aural Rehabilitation (3).** S. The study of the fundamental aspects of auditory rehabilitation, including individual and group amplification systems, auditory training, speech reading, and counseling with children and adults. Prerequisites: SPAUD 210, 217, 218 and 344.

**370 Introduction to Clinical Practicum: Observation (3).** F This course provides a supervised clinical experience in which the student clinician observes individuals who have various speech, language, or hearing impairments under the supervision of a speech-language pathologist or audiologist. This course is required as the initial field experience for speech pathology and audiology majors and is designed to introduce students to general therapy and assessment procedures across the disciplines. Prerequisites: SPAUD 101, 210, 216, 217, 218, and 311.

**384 Speech Sound Disorders across the Lifespan (3).** F Students learn about the nature, assessment and treatment of speech sound disorders in children and adults. Students review the developmental, anatomical and physiological aspects of speech sound production, learn the causes of speech sound disorders, and differentiate the characteristics

of developmental, sensory, motor and neurological speech sound disorders. Prerequisites: SPAUD 210, 216, 217, 218. It is a required course for SPAUD BA program.

**385 Language Disorders across the Lifespan (3).** S. This course on language disorders focuses on a basic understanding of pediatric and adult language differences, delays and disorders related to language-learning disabilities, attention-deficit disorders, aphasia, dementia, and traumatic brain injury. The course is a required course for BA-only SPAUD majors. Prerequisites: SPAUD 210, 216, 217, 218. It is a required course for SPAUD BA program.

**501 Diagnostic Procedures in Speech-Language Pathology (3).** F A study of the concepts and processes of the assessment and diagnosis of speech, language and swallowing disorders. Students learn best practice guidelines and ethical considerations for assessing the disorders commonly evaluated by speech-language pathologists.

**503 Language Disorders I: Infants, Toddlers and Preschool Children (3).** F A study of the nature, assessment and treatment of language disorders in infants, toddlers, and preschool children. Students learn language assessment practices and treatment strategies that are developmentally appropriate for young children that concentrate on improving communication between young children and their communication partners. Strategies for working with families with culturally and linguistically diverse backgrounds are addressed throughout the course.

**504 Language Disorders II: School-Age (3).** S. A study of the nature, assessment and treatment of language disorders in elementary, middle, and high school students. Students learn language assessment practices and treatment strategies for the school-aged population. Strength-based assessments and evidence-based practice models will be highlighted in the course along with models for collaborating with teachers and other school-based professionals.

**505 Research Methods in Speech-Language Pathology (3).** SS. A study of the speech-language pathologist's role as clinical researcher. Students read and critically

analyze existing research related to speech-language pathology, and learn common research designs and data analysis techniques. Students are required to design a research project. Not offered 2015–2016

**506 Aphasia (3).** F. Students learn about the nature, prevention, assessment, and treatment of aphasia. Cognitive and social aspects of aphasia, such as the impact of aphasia on the family, as well as the psychological, neurological, linguistic, and cultural correlates of aphasia will be included.

**508 Speech Sound Disorders (3).** SS. Students learn about the nature, assessment and treatment of speech disorders in children. Students review normal aspects of articulation and phonological development, learn the causes for speech sound disorders, and discuss phonological assessment practices and treatment strategies, as related to evidence-based practice guidelines.

**510 Fluency Disorders (3).** SS. Study of the etiology, diagnosis, treatment and prevention of fluency disorders in children and adults. Fluency disorders and their impact on individuals across the lifespan will be examined. Students learn methods of formal and informal assessment techniques, different theories and practices for treatment, counseling issues, and preventative strategies for fluency disorders in adults and children.

**512 Augmentative and Alternative Communication (3).** I. Study of the augmentative and alternative communication (AAC) assessment and treatment needs of individuals with developmental and acquired disabilities across the age continuum. Students are required to participate in technology labs to gain experience with various methods of AAC strategies and devices.

**515 Seminar in Speech-Language Pathology (3).** S. An advanced seminar on topics of current interest in speech-language pathology.

**520 Motor Speech Disorders (3).** F. Study of motor speech disorders resulting from progressive and non-progressive neurological lesions of the central and peripheral nervous systems. Emphasis is placed on etiology and neuropathology of different dysarthric syndromes, as well as on corresponding diagnostic and management options.

**521 Voice and Voice Disorders (3).** F. A theoretical and applied study of human voice anatomy and physiology and diagnosis and treatment of vocal disorders. This course covers the anatomy and physiology underlying normal voice production, the functional and organic disorders of voice, diagnostic procedures including clinical evaluation and standardized assessments, psychological interviewing principles and counseling of clients with voice disorders and the principles and techniques of voice therapy for children and adults.

**522 Neurocognitive Communication Disorders (3).** S. Study of the characteristics, underlying pathology, evaluation, and treatment of communication disorders associated with acquired cognitive impairment including dementia and traumatic brain injury. Students learn the psychological, neurologic, linguistic, and cultural correlates of adult communication disorders, as well as the cognitive and social aspects associated with dementia, agnosia, non-dominant hemisphere injury, and traumatic brain injury.

**523 Dysphagia (3).** S. Study of the nature, assessment, and treatment of swallowing disorders in adults and children. Topics include the anatomy and physiology of the normal and abnormal swallow, followed by descriptions of specific disorders that may affect each stage of the swallow. Information on normal and abnormal swallows will be integrated to provide the student with the basic entry level knowledge and skills needed to assess and implement a treatment plan for adult/pediatric patients with dysphagia.

**524 Cleft and Craniofacial Disorders (3).** S. Study of the development, characteristics, evaluation, and treatment of children with cleft lip and/or palate as well as other craniofacial syndromes that affect speech, language, hearing, and swallowing. Ethical issues, including a discussion of medical and social models of disability as related to persons with craniofacial differences, will be addressed.

**530 Clinical Practicum: On-Campus 1 (3).** F. This course provides clinical experiences in which students work directly with individuals with various communicative disorders in the Calvin Speech and Hearing Clinic. It also includes a clinical seminar session to present cases and discuss Christian

perspectives of practice. Students take this course in the fall, spring and summer semesters of their fourth year.

**531 Clinical Practicum: On-Campus 2** (3). S. This course provides supervised clinical experiences in which students work directly with individuals with various communicative disorders in the Calvin Speech and Hearing Clinic. It also includes a clinical seminar session to present cases and discuss Christian perspectives of practice.

**532 Clinical Practicum: On-Campus 3** (3). SS. This course provides the third of three supervised clinical experiences in which students work directly with individuals with various communicative disorders in the Calvin Speech and Hearing Clinic. It also includes a clinical seminar session to present cases and discuss Christian perspectives of practice.

**540 Clinical Practicum: Externship 1** (6). F. This course provides students with continued clinical learning through supervised experiences in selected off-campus sites. The course includes an advanced clinical seminar session to present cases and discuss Christian perspectives of practice. Current research and technological advances are considered for clinical application.

**541 Clinical Practicum: Externship 2** (6). S. This course provides students with continued clinical learning through supervised experiences in selected off-campus sites. The course includes an advanced clinical seminar

session to present cases and discuss Christian perspectives of practice. Current research and technological advances are considered for clinical application.

**542 Clinical Practicum: Externship 3** (6). SS. This course provides students with continued clinical learning through supervised experiences in selected off-campus sites. The course includes an advanced clinical seminar session to present cases and discuss Christian perspectives of practice. Current research and technological advances are considered for clinical application.

**595 Thesis** (1). F, S, and SS. For this course, students must successfully complete a mentored research project that results in an oral presentation and a written research thesis on a selected topic in speech-language pathology. Students must register for this course four times to complete the thesis.

**599 Critical Reflections in Speech Pathology** (3). S. This capstone course examines the application of a Reformed worldview to understanding communication and the consequences of communicative disorders. It focuses on the ways in which speech pathologists define professional activity and on the responsibilities that Christians have to work in and through this profession. Students expand their knowledge of professional ethics through a case study approach and address issues such as evidence-based practice, reimbursement issues, and conflicts of professional interest.

# Study Abroad

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For information about Study Abroad courses, often STXX, see Off Campus Programs.

## Urban Studies

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An interdisciplinary minor, urban studies focuses on urban issues and locates them within a Christian worldview. The minor consists of a curriculum of six courses, one of which must be Sociology 302, “Urban Sociology”. Remaining course work will be dependent on the student’s interests and choice of track. The minor includes three separate tracks to more specifically serve students of various majors and interests.

### **URBAN STUDIES MINOR**

(18 semester hours)

Sociology 302

One three course track from the following:

#### **Track 1: Urban Social Development**

Sociology 250

Philosophy 207

History 356

#### **Track 2: The Built Environment**

Architecture 202

Environmental Studies 210

Geography 310

#### **Track 3: Urban Policy**

Three from

Political Science 208

Political Science 202

Economics 330

Social Work 360

Two of the following elective courses:

Architecture 202, Communication Arts and Sciences 303, Economics 330, Environmental Studies 210, Geography 310, 351, History 356, 357, Philosophy 207, Political Science 202, 208, Sociology 250, Social Work 360, Spanish 310

One approved interim course will be allowed (these will be approved on an ad hoc basis by members of the minor’s governing committee).

Special topics courses and independent studies are allowed with the permission of the urban studies minor committee. Substitutions for specific classes may also be allowed with the permission of the committee.

Students may also receive credit for internships and off-campus programs (e.g.: Chicago Semester) for up to six credits. To receive such credit, a student must receive prior approval from the urban studies minor committee.



# Financial Information

## Tuition and Fees

Tuition for the academic year is \$30,425; on-campus housing with a 21 meal plan is \$9,690; the required Technology Access & Campus Activity fee is \$235, and the estimated cost for textbooks and classroom supplies is \$1,100.

Students taking fewer than twelve credit hours in a semester will be charged on a per-credit hour basis. Those taking more than 17 credit hours in a semester will be charged at the per-credit hour rate for the additional courses. The interim is considered a separate course for which there is no charge if the student completes at least 12 credit hours in either semester, unless the student enrolls in more than 4 credit hours during the interim.

Most Calvin College students receive financial assistance from the grant and scholarship programs. A special grant-in-aid, called a Denominational Grant is available to members of the Christian Reformed Church in North America to reflect the direct support such students and their families provide the College through the church.

### Undergraduate Tuition & Fees

Tuition, full-time load per year (12-17 total credit hours):	\$30,425
On-campus room and 21 meal plan Per Year	\$9,690
Technology Access & Campus Activity Fee per year	\$235
Tuition, per-credit hour rates:	
1-5 total hours (per credit hour)	\$730
6-11 total hours (per credit hour)	\$1,130
18th hour and above (per credit hour)	\$730
Tuition, auditing, per credit hour: 1/2 the normal per credit hour rate	
Summer tuition, per credit hour	\$730
Interim Course Charge (per credit hour over 4)	\$730
Additional Course Charges	
Nursing per year	\$2,600
Speech Pathology 530, 531, 532 per course	\$900

### Deposits

Enrollment deposit (U.S. & Canadian students)	\$300
Enrollment deposit (International students)	\$2,500

### Miscellaneous Fees

New Student Fees:	
Orientation Fee:	\$250
International Orientation Fee:	\$425
Transfer Student Orientation Fee:	\$150
Encore Fee:	\$50
Individual Music Instruction:	
12 One hour lessons per semester	\$600
12 Half-hour lessons per semester	\$300
Off-campus non-Calvin program fee	\$250
Examination fee (course credit)	\$60
Examination fee (exemption)	\$25
Transcript fee	\$5
Visitor fee, per course	\$55
One Year Parking Permit	\$150
United HealthCare Student Insurance	\$1,344

### Graduate Program Tuition & Fees

Graduate Speech Pathology (5th yr) per credit hour	\$833
Graduate Education Courses per credit hour	\$456

Payments for tuition, room and board are to be made as per the following payment schedule unless payment is rendered in full at the beginning of each semester.

Due Date	Tuition, Technology Access & Student Activity Fee	Room & Board		
		21 Meals	15 Meals	10 Meals
<b>1st Semester</b>				
September 4, 2015	\$5,110	1,615	1,570	1,497
October 20, 2015	5,110	1,615	1,570	1,497
November 20, 2015	5,110	1,615	1,570	1,496
Total for 1st Semester	\$15,330	\$4,845	\$4,710	\$4,490
<b>2nd Semester</b>				
January 5, 2015	\$5,110	\$1,615	\$1,570	\$1,497
March 21, 2016	5,110	1,615	1,570	1,497
April 21, 2016	5,110	1,615	1,570	1,496
Total for 2nd Semester	\$15,330	\$4,845	\$4,710	\$4,490
<b>Academic Year</b>	<b>\$30,660</b>	<b>\$9,690</b>	<b>\$9,420</b>	<b>\$8,980</b>

*Note: There is no interim tuition charge for regular on-campus courses if a student maintains twelve semester hours in either the first semester or the second semester unless the student exceeds the four credit limit set for the interim. If a student maintains eleven semester hours in both the first and second semester, the regular semester hour interim tuition charge will be discounted by 25%. Otherwise, students will be charged the regular per semester hour charge for interim courses. Course fees and off-campus travel costs are in addition to any interim tuition charge.*

Calvin administers all billing statements electronically. Students are advised via email that their statements are available to them on online. Additionally, Students may give permission for others to receive copies of their statements through Calvin's E-Statement subscription service. Each time a new statement is generated, a courtesy copy is then sent via e-mail to a list of subscribers designated by the student. E-Statement copies will continue to be sent each statement period until the student removes the subscriber from the service.

The balance for total tuition, room and board charges are reduced by all financial aid credits a student receives for the semester. Any balance due from the student will be divided into three payments per semester. The three payments will be due as per the payment schedule due dates. Accounts not paid on time are subject to a late payment fee of 1% per payment period on the outstanding minimum amount due. Students whose accounts are not paid according to the schedule will be prohibited from registering for future classes. Transcripts are not issued for students with past due accounts. The ability to charge miscellaneous expenses to a campus billing account will also be suspended.

Any charges or credits not directly related to the student's tuition, room or board are placed on a separate billing statement called the Statement of Miscellaneous Charges. This billing statement is posted on the student's online account on a monthly basis and all charges are due in full on the 1st of each month.

Students are required to maintain accurate local and permanent home billing addresses. Should a student's account become delinquent, the account may be placed with an outside collection agency. All fees associated with the collection process shall be the responsibility of the student and will be added to the student's total account balance.

An enrollment deposit is required of all enrolling first-year, transfer and re-admitted students. This deposit serves as a confirmation of the student's plan to enroll and is credited to the Statement of Miscellaneous Charges and is used as payment towards the orientation fee, and any other charges the student might put on this account. First-year students must pay this deposit by May 1. The due date for transfer students is June 1. The enrollment deposit is not refundable after the due date. Former students who have been readmitted to the college must pay their enrollment deposit by August 1.



Dually enrolled students are individuals who are still attending high school, but are concurrently enrolled in college courses. Dually enrolled students may take up to two college courses per semester at a reduced rate. For 2015-2016, the dually enrolled tuition rate is \$365 per registered credit. Dually enrolled students are also permitted to take one Interim course at the reduced rate. Dually enrolled students who are taking more than 2 college courses in a semester will be charged \$1,130 per credit hour for each additional course.

Tuition charges for dually enrolled students are due in full at the beginning of each semester.

## Course Audits

Students with 0 to 5 non-audit total credits who choose to audit a class will be charged at \$365 per credit hour for the audited course.

Students with 6 to 11 non-audit total credits who choose to audit a class will be charged at \$565 per credit hour for the audited course.

Students with 12-17 non-audit total credits will incur no extra charge for auditing a course.

Students with more than 17 non-audit total credits who choose to audit a class will be charged at \$365 per credit hour for the audited course that exceeds the semester credit limit.

Students with more than 4 credits during the interim will be charged \$365 per credit hour for the audited course that exceeds the interim credit limit.

Students who switch a non-audit class to an audit class will have their financial aid revised as necessary. There is no financial aid for an audited course.

## Check Cashing Policy

Students may cash personal and payroll checks upon presentation of a valid Calvin College ID card. Checks may not exceed \$200.00 and must be made payable to "Cash" or to the person cashing the check. Cashing of third party checks is not permitted. Students who present a Canadian funds check for cash will be charged a \$5.00 service fee per check.

A bounced check fee will be assessed on all checks paper or electronic returned by the bank either for insufficient funds or incorrect account numbers. For the amount of the fee please refer to the Financial Services website. In addition, check cashing privileges will be subject to suspension if three checks are returned during any nine-month period. Check cashing privileges will also be suspended if a student has an unsatisfactory financial account balance with Calvin College.

All checks that are returned by the bank will automatically be deposited a 2nd time unless prohibited by the payer's banking institution.

Calvin College does not accept post-dated checks. All checks, regardless of date, will be deposited upon receipt.

## Institutional Withdrawals

Students considering withdrawing who are concerned about the effect on their financial aid are encouraged to contact the Office of Admissions and Financial Aid.

Students withdrawing from one or more courses, but not discontinuing, may have their tuition charges for those courses adjusted. Financial aid will be reviewed and may likely be reduced based on the revised tuition charges.

Students who discontinue enrollment before completing 60% of a semester will be re-evaluated for financial aid eligibility for the semester based on the revised tuition charges and the period of time they were enrolled. Students may be required to return a portion of the aid they originally received to the appropriate programs. A calculation will be made based on the official withdrawal date and the resulting revised tuition charges.

Tuition charges for students withdrawing from the College will be refunded as follows:

- Calendar days 1-10 100%
- Calendar days 11-24 80%
- Calendar days 25-31 60%
- Calendar days 32-38 40%
- After 38 calendar days 0%

Room and board charges will be prorated over the entire semester for students who leave on-campus housing during the semester.

All other charges such as, but not limited to, laboratory fees, art material fees, application fees, and health insurance fees are non-refundable.

### **Return of funds to aid programs is as follows:**

- **Federal Title IV Aid**—If a student withdraws from the institution (discontinues) before completing 60 percent of the semester, the institution must determine the percentage of Federal Title IV assistance the student has earned. The percent is determined by dividing the total number of calendar days in the semester into the number of calendar days completed as of the withdrawal date. Any unearned amount must be returned to the Federal Title IV program(s).
- **State of Michigan Aid**—The reduction in the state award is calculated on the percent of tuition and fees originally paid by the state award. This percent is applied to the revised tuition charges (based on the withdrawal date) and results in the amount of the original state award that the student retains. The remaining amount is returned to the state.
- **Institutional Aid**—For students withdrawing from the institution, the reduction in institutional aid is based on the percent of tuition and fees originally paid by the total of all Calvin awarded grants and scholarships. The percent is applied to the revised tuition charges (based on the withdrawal date) and results in a reduced amount of institutional aid.

Students considering withdrawing who are concerned about the effect on their financial aid are encouraged to contact the Office of Scholarships and Financial Aid.

The Financial Services Office will issue a check to the student for any credit balance remaining on their account after all charges have been paid and refunds have been made. If a cash disbursement has been made to a student before discontinuing to pay for off-campus living, or other educationally related expenses, the Office of Scholarships and Financial Aid will determine whether repayment of a portion of the cash disbursed is required and notify the student if there has been an overpayment that needs to be repaid. Upon collection, the overpayment will be returned to the appropriate financial aid program(s).

## **Scholarships and Financial Aid**

Calvin participates in all federal and state financial aid programs available to our students. In addition, Calvin sponsors a number of its own programs, which are used to supplement federal and state programs. Financial assistance is available through the following programs:

1. **Scholarships** – Scholarships do not require repayment and are typically awarded based on academics or another area of achievement or qualification. Calvin's scholarship programs include academic scholarships, diversity awards, donor-funded scholarships and several other awards.
2. **Need-based Scholarships and Grants** – State and federal programs are available based on need as demonstrated on the FAFSA (Free Application for Federal Student Aid) at [www.fafsa.gov](http://www.fafsa.gov). Calvin also funds its own grant programs for students who are not eligible for state or federal grants or who need more assistance than state and federal programs provide.

3. **Loans** – Governmental loans are available to assist with college expenses and must be repaid, often with interest.
4. **Employment** – On-campus jobs are available through federal work-study and through Calvin student-employment programs.

The steps for applying for financial aid and related financial aid policies are found on Calvin's website. Those who apply for financial aid receive an award package indicating their eligibility for aid, including scholarships, grants, and loans. Questions regarding financial aid should be directed to the Office of Scholarships and Financial Aid.

## Scholarships and Awards

Calvin offers scholarships to recognize and encourage academic excellence. Calvin's academic scholarships are awarded based on the student's academic record and potential. Other scholarships and awards are offered based on a variety of student characteristics and other criteria. The college's donor-funded scholarships consider such factors as program of study, financial need, vocational aspirations, and a variety of other criteria. In total, nearly 6,000 scholarships are awarded annually. For a complete listing, specific criteria, and renewal information, please visit Calvin's website.

### Academic Scholarships

More than 85% of first-year students are awarded a renewable, academic scholarship. Calvin's academic scholarships are awarded based on the student's unweighted GPA, standardized test score, and information from the student's admission application. Students are automatically considered for an academic scholarship soon after admission. **Academic scholarships** range from \$2,000 to \$15,000. Specific criteria and renewal information can be found on Calvin's website.

### Other Scholarships and Awards

**Diversity Awards** are awarded in an effort to develop a community that values cultural understanding, a diverse student body, and an enhanced quality of education. Most recipients are North American ethnic minority students, but can include majority students from ethnically diverse backgrounds. Candidates are U.S. citizens, eligible non-citizens, and Canadian citizens. These \$4,000 renewable awards are offered in addition to the Calvin academic scholarships.

**The First Generation Award** recognizes the added barriers that can make it difficult for first-generation students to attend college. This award is offered in recognition of those challenges. The \$2,000 renewable award is to first-year students whose parents have not attended college.

**The Alumni Legacy Scholarship** is awarded to first-year students who are third-generation legacy students. To be considered for this \$1,500 scholarship, students must have a minimum 3.00 GPA, submit an application with an essay by February 1, and have at least one alumni parent plus at least two additional direct ancestors (e.g. parent, grandparent, great-grandparent) who are Calvin alumni.

**Denominational Grants** ranging from \$800 to \$1,500 are awarded to members of the Christian Reformed Church in North America as a result of contributions from the denomination.

### Donor-Funded Scholarships

Thanks to the gifts of generous alumni and friends of the college, Calvin students also benefit from close to 700 named and departmental scholarships. Through these awards, Calvin donors provide recognition and financial support to students, promote certain fields of study, encourage students in their chosen vocations and career paths, and ultimately advance Christ's Kingdom. Over 1,500 of these special scholarships are awarded, providing more than \$3 million to students.

These scholarships vary in criteria and range in amount. A searchable database with full descriptions of these scholarships, application procedures, and eligibility requirements can be found on Calvin's website. **Maximum consideration for donor-funded scholarships is given to newly admitted students who apply by February 1 and to current students who apply by March 1.** For scholarships where financial need is a consideration, an application for financial aid is required. All forms are available on Calvin's website.

### Transfer Scholarships

Admitted transfer students are considered for academic scholarships ranging from \$2,000 to \$15,000. Selection is based on the same criteria used for first-year students along with the applicant's college GPA. Typically, a previous college GPA of 3.00 or higher is required to be considered for academic scholarships. Transfer students may also be considered for other awards. Specific criteria and renewal information can be found on Calvin's website.

### Scholarship and Award Renewal

Academic scholarships and some other awards are renewable if the student maintains a qualifying cumulative Calvin GPA, as outlined on Calvin's website. First-year students are considered for renewal based on their cumulative Calvin GPA at the end of their first academic year. Returning students are considered for renewal based on their cumulative Calvin GPA at the end of the January interim. Renewal criteria and amounts are based on the original scholarship received and the renewal requirements in place at the time of the original award. Students who significantly exceed the renewal criteria of their original academic scholarship may be eligible for a \$2,000 academic achievement award. For further details, visit Calvin's website.

### Student Awards and Fellowships

Some departments offer **student awards** for student achievement in specific fields of study, such as history, mathematics, philosophy, English, Latin, medicine, music, biology, psychology, missions, chemistry/biochemistry, classics, education, Dutch, and Greek. These student awards frequently go to seniors. Additional information is available through the departments involved.

**Summer fellowships** in the natural sciences, social sciences, and humanities give students an opportunity to work alongside faculty for nine or ten weeks on current research projects. Students receive a stipend for nine or ten weeks of work. Each year, over 100 students participate in these programs, in on-campus and off-campus settings.

**The Jubilee Fellowship Program**, established with a grant from the Lilly Endowment, is supported by faithful Calvin alumni eager to encourage students who are strongly inclined toward spiritual leadership and Christian ministry. Twelve Jubilee Fellows participate in a spring seminar and receive a summer fellowship stipend as well as living and travel expenses.

For further details, visit Calvin's website.

### Need-Based Financial Aid

Significant need-based financial aid is available to students from Calvin, the federal government, and various state and provincial governments.

**Applications for need-based aid must be filed each year as follows:**

#### U.S. citizens and eligible non-citizens:

- Complete the FAFSA (Free Application for Federal Student Aid) at [www.fafsa.gov](http://www.fafsa.gov)
- The Calvin Supplemental Aid Form may also be completed to communicate additional and special financial circumstance

#### Canadian citizens:

- Complete the Calvin Canadian Financial Aid Form

**International citizens:**

- Complete the Calvin International Student Application for Financial Aid
- Provide supporting financial documents

Additional information may be required to complete the financial aid application process at Calvin. Application forms and information about the criteria used to determine eligibility for need-based aid are available on Calvin's website.

**Recommended deadlines to apply for need-based aid:**

First-year students: February 15 (April 1 for Canadian and International students)

Upper-class students: March 1 (June 1 for Canadian and International students)

Applying by these dates will ensure maximum consideration for all programs for which the student qualifies. Applications submitted after these dates are also considered, though some funds may be limited.

**Calvin Grant** The college established a program for students who have financial need. Awards are dependent on need and other financial aid received.

**Grants for Off-Campus Programs** The college provides need-based grants to students enrolled in off-campus courses when there is additional cost involved. This includes off-campus interim courses as well as selected programs for the semester or academic year where the cost is higher than for a student on campus. The amount of the grant varies based on the additional cost involved and the student's financial need.

**Federal Pell Grants** The Pell Grant Program, funded by the federal government for U.S. citizens and eligible noncitizens, is designed to provide grant assistance to high need students. Only students in undergraduate programs are eligible.

**Federal Perkins Loans** This is a program sponsored by the federal government for U.S. citizens and permanent residents and provides long-term loans to students with financial need. Repayment can be deferred as long as the borrower is enrolled in college at least half time. Repayment begins nine months after the borrower ceases to be at least a half-time student, and the interest rate during repayment is 5% simple interest.

**Federal Supplemental Educational Opportunity Grant** This is a program funded by the federal government and provides funds to the college for high need students. Recipients must be U.S. citizens or permanent residents of the U.S. and must be enrolled in an undergraduate program.

**Federal Teacher Education Assistance for College and Higher Education (TEACH) Grant** The TEACH Grant Program is a non-need based program funded by the federal government. It provides grants of up to \$4,000 per year to students who agree to teach a subject in high demand in a public or private elementary or secondary school serving students from low-income families for at least four years. Recipients must maintain a cumulative Calvin GPA of 3.25 or higher and must meet the four year requirement within eight calendar years of completing the program of study for which they received a TEACH Grant. If recipients fail to complete this service obligation, all amounts of TEACH Grants that have been received will be converted to a Federal Direct Unsubsidized Stafford Loan.

**Federal Direct Stafford Loan Program** The federal government provides subsidized and unsubsidized loans through this program to U.S. citizens and eligible non-citizens to assist with education expenses. The amount of the Subsidized Stafford loan is dependent on financial need and class level, ranging from a maximum amount of \$3,500 per year for first year students and \$5,500 per year for seniors. Dependent students who receive the maximum Federal Subsidized Stafford Loan are also eligible for a \$2,000 Federal Unsubsidized Stafford Loan. Independent students have additional unsubsidized loan eligibility. Students who are not eligible for the maximum amount in the subsidized program are eligible for increased amounts in the unsubsidized loan program. The unsubsidized loan is not based on financial need. Both loans have fixed interest rates and are backed by the federal government. The subsidized loan is interest-free while the student is enrolled at least half time, while the unsubsidized loan accrues interest from the time it is disbursed.

Both loans enter repayment six months after the student ceases to be enrolled at least half time. All Federal Direct Loans for graduate students are unsubsidized. The maximum loan eligibility is \$20,500 per academic year.

**Federal Parent Loan for Undergraduate Students (PLUS)** The federal government provides non-need-based loans to parents of undergraduate students. Parents must have an acceptable credit history to qualify. The maximum loan eligibility is the cost of attendance minus other financial aid. PLUS loans have a fixed interest rate which accrues until the loan is paid in full.

**Federal Work-Study Program** A federal aid program providing funds for part-time employment on campus or in approved agencies off campus. Student's must demonstrate financial need by completing the FAFSA, and be enrolled at least half time.

**Canada Student Loans** The Canadian government sponsors an interest-free loan program for Canadian citizens with a maximum loan depending on the province. Application forms are available from provincial Offices of Education.

**Michigan Competitive Scholarships and Tuition Grants** The State of Michigan provides awards to Michigan residents attending eligible institutions in the state. Competitive Scholarships are awarded on the basis of ACT scores and need. Tuition Grants are awarded solely on the basis of need. Competitive Scholarships are available only to undergraduate students.

### Post-Baccalaureate Awarding

Post-baccalaureate students who are degree-seeking or on a certification track are eligible for financial aid consideration in a limited number of financial aid programs and are encouraged to complete the FAFSA. These students will be considered for the Calvin Denominational Grant, institutional need-based grants, and federal student loans. Post-baccalaureate students may also apply for some institutional scholarships specific to post-baccalaureate study. Post-baccalaureate students are not eligible for federal or state need-based grants or Calvin academic scholarships. Calvin graduates who return as post-baccalaureate students are only eligible for aid if seeking a different type of degree. Non-degree seeking students are considered for the Calvin Denominational Grant.

### Graduate Awarding

Graduate students are eligible for financial aid consideration in a limited number of financial aid programs and are encouraged to complete the FAFSA. These students will be eligible for federal student loans and considered for the Calvin Denominational Grant. Graduate students may also be eligible to apply for the Federal TEACH Grant. Graduate students are not eligible for federal, state, or institutional need-based grants or Calvin academic scholarships.

### Awarding Policies

The total amount of aid from all sources, including all loans, grants, scholarships, waivers and VA benefits cannot exceed a student's budgeted cost of attendance: tuition, required fees, room and board, books, personal living expenses and transportation expenses. If total aid exceeds the budgeted cost of attendance figure, financial aid will be reduced beginning with loan eligibility, followed by institutional grants, waivers and finally scholarships.

The total amount of institutional gift aid (grants, scholarships and waivers) cannot exceed the cost of tuition. If total institutional gift aid exceeds tuition, aid will be reduced beginning with institutional grants, then institutional waivers and finally institutional scholarships.

Financial aid for repeated coursework is only available in limited situations. Based on federal policy, financial aid is only available to students on their second attempt of a previously passed course. While students are allowed to take a course for the third time, no financial aid will be provided.

Students receiving any VA benefit (i.e., ROTC, Post 9/11, Yellow Ribbon, etc.) may have an adjustment made to their institutional aid.

### **Enrollment Requirements for Financial Aid**

Most scholarships and financial aid programs require at least half time enrollment (6 semester hours per semester for undergraduates and 4.5 for graduate students). Students who enroll at least half time but less than full time can be considered for financial aid in reduced amounts. Audited classes are excluded in determining eligibility for financial aid.

There are three exceptions to these requirements, all of which are based on the number of hours for which a student is registered: the Denominational Grant, the Federal Pell Grant and the Federal TEACH Grant.

### **Satisfactory Academic Progress Policy**

Calvin maintains a Satisfactory Academic Progress (SAP) policy. Students must maintain an appropriate cumulative GPA and completion percentage in order to qualify for financial aid in most programs. These requirements are established to ensure that students who receive financial aid are progressing toward degree completion. The SAP policy aligns with the college's standards used for academic probation and dismissal. The Calvin SAP policy is available on Calvin's website.





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- \*\*Carolyn E. Anderson, Ph.D. (California-Irvine, 2003)  
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