

Sustainability Course Inventory (AY 2018-19)

last revised 12.06.2018 B. Haney

Courses on Sustainability

Regular Term

| | | |
|----------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BIOL-160 | Ecology and Evolutionary Biology | Biology 160 describes the characteristics of healthy ecosystems, ways ecosystems and ecological processes are threatened, and steps that can be taken to maintain or restore ecological processes. |
| BIOL-364 | Global Health, Environment, & Sustainability | Students examine contemporary societal challenges around sustainability. |
| ECON-232 | Sustainability Economics | Students examine contemporary societal challenges around sustainability. |
| ECON-233 | Economics of Energy and Sustainability | Students examine the relationship of energy to the economy through the lens of sustainability. |
| ENST-210 | Human Impacts on Environment | Students examine contemporary societal challenges around sustainability. |
| ENST-302 | Environment and Society | Students examine contemporary societal challenges around sustainability. |
| SCES-122 | Science Content and Skills for Elementary Teachers | This course addresses issues related to sustainability, such as the interconnectedness of factors in an ecosystem, fragmentation, global climate change, and associated human responsibility as it relates to care for the natural world. |
| ENGR-184 | Sustainability Challenges | This course examines the challenges to achieving sustainability in three areas: economic, social, and environmental. |
| ENGR-384 | Analysis of Sustainability Engineering Systems | This course analyzes the effectiveness of proposed sustainability engineering systems and methods to obtaining that goal in three areas: economic, social, and environmental. |
| GEO-352 | Urban Planning for Sustainable Communities | Students examine complex, contemporary societal challenges around urbanization and sustainability. |

Interim

| | | |
|----------|----------------------------------------------------------------|--------------------------------------------------------------------------|
| ENGR-W80 | Sustainable Energy Systems | Students examine contemporary societal challenges around sustainability. |
| ENST-395 | Seminar in Environ Studies | Students examine contemporary societal challenges around sustainability. |
| PHIL-W10 | Peaceable Kingdom: Transforming Our Relationships with Animals | Students examine contemporary societal challenges around sustainability. |

Courses with a Sustainability Component

Regular Term

| | | |
|----------|--------------------------|---------------------------------------------------------------------------------------------|
| ARTE-315 | Elementary Art Education | Students examine aspects of art education in relation to society and the environment. |
| ARTE-316 | Secondary Art Education | Students examine aspects of art education in relation to society and the environment. |
| BIOL-123 | Living Systems | Students examine the ecosystem in relation to society and contemporary societal challenges. |

| | | |
|--------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BIOL-230 | Physiological Systems | Interrelationships between plants and soils are presented and ways in which plants of various photosynthetic systems respond to temperature, carbon dioxide and precipitation variation are developed. |
| BIOL-250 | Research Design & Methodology | Students examine the ecosystem in relation to society and contemporary societal challenges. |
| BIOL-332 | Plant Physiology | Interrelationships between plants and soils are developed, physiological ecology of individual plant and plant community functions, and ways in which physiological processes of plant types are responding to global climate change. |
| BIOL-338 | Animal Behavior | Impacts of anthropogenic noise on bird communication and nesting success; impacts of habitat loss and fragmentation on animal movement, distribution, and genetic diversity are presented. |
| BIOL-345 | Ecosystem Ecology & Mgmt | Students examine the ecosystem in relation to society and contemporary societal challenges. |
| BIOL-346 | Plant Taxonomy | Students examine the ecosystem in relation to society and contemporary societal challenges. |
| BIOL-395 | Perspectives in Biology | Students develop an ethics-centered thesis paper and presentation on a biological issue of their choice. |
| BUS-360 | Management and Org. Behavior | This course helps students develop an integrated understanding of management based on God's revelation in creation and His Word. |
| BUS-362 | Ethics in Business | It familiarizes business students with three key knowledge areas, current legal stipulations for business conduct, normative frameworks for evaluating actions or policies, and systems and techniques for promoting ethical behaviors and overcoming rationalizations for misbehavior. |
| BUS-365 | Human Resource Management | The emphasis is 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. |
| BUS-366/PSYC | Adv Topics in Human Resources | The principles of industrial and organizational psychology and human resource management are applied to current topics including employee socialization and employee attitudes and behaviors. |
| BUS-380 | Marketing | It studies the distribution of ideas, goods, services, experiences, and values that attempts to satisfy individual and organizational needs. |
| BUS-382 | Consumer Behavior | Students explore the various ways consumer choices can affect the environment. |
| CHEM-103 | General Chemistry I | The course is taught from a biblical and reformed world-view and addresses the issues of water, climate, energy and food and the human responsibility for applying chemical knowledge to better care for natural resources. |
| CHEM-103H | General Chemistry I - Honors | The course is taught from a biblical and reformed world-view and addresses the issues of water, climate, energy and food and the human responsibility for applying chemical knowledge to better care for natural resources. |

| | | |
|-----------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CHEM-105 | Chemical Principles | The course is taught from a biblical and reformed world-view and addresses the issues of water, climate, energy and food and the human responsibility for applying chemical knowledge to better care for natural resources. |
| CHEM-105H | Chemical Principles - Honors | The course is taught from a biblical and reformed world-view and addresses the issues of water, climate, energy and food and the human responsibility for applying chemical knowledge to better care for natural resources. |
| CHEM-271 | Environmental Chemistry | It has a special focus on environmental problems arising from the activities of humans, including study of acid precipitation, greenhouse gases, water and soil pollution, and risk assessment all presented within the context of a Christian view of humans and nature. |
| CHEM-295 | Chemistry Seminar | Numerous speakers every semester intentionally educate on and promote issues of sustainability. |
| CS-112 | Intro to Data Structures | Advanced programming techniques such as indirection, inheritance and templates are introduced, along with an emphasis on algorithm analysis, efficiency and good programming style. |
| CS-374 | High Performance Computing | A study of architectures, algorithms and programming techniques that help minimize the execution times of computer programs. |
| ECON-221 | Principles of Microeconomics | Topics include the role of the government in the economy and environmental impact of economic activities. |
| ECON-222 | Principles of Macroeconomics | It includes study of business investment, government spending, taxation, monetary policy, unemployment, and inflation and its effect on global and intergenerational equity. |
| ECON-236 | Emerging Economies: BRIC | Students will consider how legal, technological, political, and cultural environments influence economic and business relations between countries. |
| ECON-241 | Health Econ & Health Policy | 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. |
| ECON-330 | Urban Growth and Development | Students examine the ecological footprint of various models of urban life. |
| ECON-337 | Wrld Poverty & Econ Devel | The course considers the impact of poverty, economic growth, and government interventions on the poor and future generations |
| ECON-339 | Government Finance & Public Policy | Students examine the impact of taxation and zoning on the ecological footprint of the economy. |
| EDUC-302 | Curriculum & Instruction for Diverse Learners | Pre-service teachers engage in experiential education, partnering with Plaster Creek Stewards and four 8 th grade classes from two West MI schools, one upstream the other downstream. A total of five class hours are spent in field-based training and stream-health data collection. |
| EDUC-398 | Education Capstone | This course includes a unit on sustainability related to classroom material use and schools' environmental impact. |

| | | |
|----------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENGL-230 | Understanding Literature / Environmental Literature | First, literature invite us to linger in imaginary worlds, to slow down, to think more deeply about ourselves, our relationships, our God, and the real world in which we live. It helps us imagine—and come to love—forgotten, impossible, and wonderful places. As John Calvin said, "“there is not part of the world so small that at least some spark of God’s glory does not shine there.” Second, environmental literature explores ideas, actions, and moral decision-making as these relate to issues raised by environmental and creation care movements. Third, literature encourages us to look closely at language, at what it can do and what it can’t quite manage to say. Because words always |
| ENGL-395 | Senior Seminar (Felch) | Senior Seminar asks students T to think about four issues: their training as a wordsmith at Calvin College; the challenges of contemporary culture; the Christian tradition; and their own vocation. Environmental justice and creation care are woven into many of the works we study, but particularly come to the fore in Anne Dillard’s <i>Holy the Firm</i> , which examines the faithful life within the context of creation and suffering. |
| ENGR-101 | Intro to Engineering Design | Students discuss engineering design norms, including the norm of stewardship. |
| ENGR-205 | Principles of Materials Science | Students develop understanding of material properties, including sustainability factors that influence engineering design |
| ENGR-209 | Introduction to Conservation Laws and Fluid Mechanics | This class is a survey in many domains of issues related to sustainability. |
| ENGR-294 | Engineering Seminar | Some seminars focus on sustainability issues. |
| ENGR-303 | Chem Engr Prncples/Thrmodynamics | Some lectures focus on sustainability issues. |
| ENGR-305 | Mechanics of Materials | Understanding material strengths and how material fail allows for design which minimizes the use materials, allows for optimal material choices, and can work to manage the life cycle impact of the design. |
| ENGR-306 | Prin of Environmental Engring | Students develop understanding of physical, chemical, and biological process used for the preservation and protection of the environment and society |
| ENGR-308 | Environmental Engr Design | Students develop understanding of physical, chemical, and biological process used for the preservation and protection of the environment and society |
| ENGR-312 | Chemical Engr Thermodynamics | Students design systems using physical, chemical, and biological processes for the preservation and protection of the environment and society |
| ENGR-318 | Soil Mechanics&Foundatn Design | Study of soils includes consideration of environmental impact. |
| ENGR-319 | Intro to the Thermal/Fluid Sci | One of the foundational concepts of thermodynamics is to do design with a minimum use of energy. |
| ENGR-320 | Hydraulic Engineering | Groundwater flow topics invovle discussion of water quality |
| ENGR-321 | Hydraulic Engineering Design | Hydrologic modeling includes an emphasis on protecting watersheds |
| ENGR-324 | Matl & Proc in Manufacturing | Students complete a lab experience on life cycle design. Manufacturing processes are compared based on energy use and waste generation. |
| ENGR-328 | Inter. Thermal/Fluids Sci. Des | Energy conversion machines (engines, refrigerators, air-conditioners) are discussed, and sustainability is used as a frame for the entire course |

| | | |
|----------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENGR-330 | Fluid Flow and Heat Transfer | Transfer and retention of energy and energy efficiency are discussed in many ways, including building insulation, the concept of thermal mass, heat losses, and heat transfer efficiency. |
| ENGR-333 | Thermal Systems Design | Always has a sustainability-related whole-class project |
| ENGR-334 | Dynamics of Machinery | A wind turbine gear design project requires students to research wind power contributions to sustainable energy generation. |
| ENGR-394 | Engineering Seminar | Some seminars focus on sustainability issues. |
| GEOG-110 | World Regions | Environmental sustainability is featured covering the principal environmental issues facing each world region covered in the course - Latin America, Sub-Saharan Africa, North Africa & Southwest Asia, Europe, East Asia, South Asia & Southeast Asia. |
| GEOG-120 | Earth Systems | Understanding of Earth systems is applied to concepts of stewardship, resource use and wise living with place-based hazards and opportunities. |
| GEOG-181 | First-Year Research in Earth Sciences: Dunes | The research-based focus on understanding Great Lakes coastal dunes includes human interactions with dunes, including human impacts, dune management, and stewardship. |
| GEOG-200 | People, Place and Community | This course examines the role of humans in the context of their inhabitation of Earth. |
| GEOG-230 | The Global Economy | This course includes a section to deepen understanding of the relationship between the economy and environment, structured around <i>The Story of Stuff</i> by Annie Leonard. |
| GEOG-242 | Africa | This course on the geography of Africa includes topical foci and case studies of the challenges of water scarcity, environmental degradation and climate change in sub-Saharan Africa. |
| GEOG-243 | The US and World Regions | Environmental sustainability is featured covering the principal environmental issues facing each world region covered in the course - North America, Latin America, Sub-Saharan Africa, North Africa & Southwest Asia, Europe, East Asia, South Asia & Southeast Asia. |
| GEOG-250 | Meteorology | Human interactions with atmospheric processes and weather are examined, including weather hazards, air pollution and climate change. |
| GEOG-261 | Geographic Information Systems and Cartography | Through mapping and analysis, this course builds on sustainability concepts of agriculture planning, landscape change, built environment, and use of geospatial technologies (GIS, GPS) towards sustainability initiatives such as urban tree inventories. Final projects may be proposed as sustainability focused geographic analysis. |
| GEOG-290 | Seminar | Presentations by guest lecturers and students include topics related to sustainability in geology, geography and environmental studies. |
| GEOG-310 | Urban Geography | The examination of the spatial organization and systems of cities includes history, infrastructure, economic life, social activities, ethnicities, institutions and politics. |

| | | |
|----------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GEOG-322 | Coastal Geomorphology | Coastal land use and hazards, shoreline management, and coastal stewardship are the focus of classes, labs, field trips and assignments. |
| GEOG-351 | City & Regional Planning | Land use planning and zoning, housing and community development, environmental planning, transportation planning, historic preservation and urban design, and other subfields are examined within neighborhood, downtown, suburban, regional and Third World contexts. |
| GEOG-361 | Advanced Geographic Information Systems | Through mapping and analysis, this course builds on sustainability concepts of geographic links to climate change with 3D ice monitoring, hydrological modeling, and construction of online mapping systems. Final projects may be proposed as sustainability focused geographic analysis. |
| GEOG-380 | Seminar in Geographic Thought | This course explores the development of philosophical thought in geography, including the historical underpinning roots of environmental determinism, globalization, climate effect influence on moral and social development, and humans as a geographic agents. This course helps students understand the conceptual framework of modern sustainability. |
| GEOL-151 | Introductory Geology | This course studies the materials and processes of Earth leading to a responsible Christian appreciation for and stewardship of Earth. |
| HIST-257 | The American West | Examines the environmental impact of the development of the American west, particularly as it relates to water resources. |
| IDS-201 | Intro to International Develop | Students examine the interrelationships between economic development, social injustice, and the environment. |
| IDS-351 | Theories of Int'l Development | Students examine the interrelationships between economic development, social injustice, and the environment. |
| HE-266 | Health: Disease, Sub Abuse, and the Environment | Students examine the interrelationships between health, social injustice, and the environment. |
| NURS-308 | Strategies: Community-Based Health | Students examine the interrelationships between health, social injustice, and the environment. |
| NURS-380 | Critical Reflections | Student groups examines critical issues in nursing from different perspectives (ethics, history etc.), including topics in sustainability. |
| POLS-208 | Urban Politics | Students applies course concepts to contemporary societal challenges around sustainability. |
| POLS-212 | American Public Policy | Students applies course concepts to contemporary societal challenges around sustainability. |
| POLS-214 | Governments and Globalization | Students explore political institutions, intrastate conflict, human rights, environmental protection, and social welfare policies from a comparative perspective. |
| POLS-309 | International Organizations and Law | Students applies course concepts to contemporary societal challenges around sustainability. |
| PUBH-101 | Introduction to Public Health | Students examine the interrelationships between health, social injustice, and the environment. |
| PUBH-248 | Epidemiology | Students examine the interrelationships between health, social injustice, and the environment. |
| PUBH-295 | Public Health Seminar | Students examine the interrelationships between health, social injustice, and the environment. |

| | | |
|--------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REL-232 | Creation and Humanity | It teaches the cultural mandate and the idea of stewardship. |
| REL-295 | Christianity and Culture | It is a critical survey of models by which God's people have defined their relationship to the world, from Biblical times to the present. |
| REL-332 | Theological Ethics | Ethical issues such as war, human sexuality and reproduction, death and dying, and the environment are analyzed in light of theological commitments. |
| SOC-302 | Urban Sociology | It includes an evaluation of the ecological benefits of increased housing density, walkability, biking, mass transit, and the reduction in the acreage amount and overall design of suburban development. |
| <i>Interim</i> | | |
| BIOL-W80 | Ecotoxicology | Students applies course concepts to contemporary societal challenges around sustainability. |
| ENST-W40 | The Changing Great Lakes | Students applies course concepts to contemporary societal challenges around sustainability. |
| GEOL W40 | Hawaii: Volcanoes in the Sea | Students applies course concepts to contemporary societal challenges around sustainability. |
| GEOL 112 | Earth Science for Educators | Students applies course concepts to contemporary societal challenges around sustainability. |
| GEOL 153 | Big Sky Geology: Montana Field Experience | Students applies course concepts to contemporary societal challenges around sustainability. |
| Sowk-W10 | Grand Rapids | Includes a special emphasis on issues of social and environmental justice and the effects of city living on historically marginalized populations. |