

# Environmental Science, Public Health, and Sustainable Development

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The Department of Environmental Science, Public Health and Sustainable Development (EPS) provides students with practical scientific knowledge and ethical grounding for stewardship of the environment and human communities, as well as professional skills to effectively minister to a world in need. We capture this approach as “science for stewardship and service,” which includes a deeper understanding of the Christian foundation beneath a faith-based pursuit of knowledge and application in our courses. This approach, both inside and outside the classroom, is fundamental to our offering of Foundational Core courses for students completing other majors in the liberal arts as well as to students majoring in our department. To this end, we offer majors in Environmental Science, Public Health, and Sustainable Development; one integrated major in Chemistry—Environmental Science; and two minors, all of which involve a deep concern for God’s human and non-human creation.

## Environmental Science

In this major, in existence since the 1982, students gain scientific knowledge in natural sciences, principles of stewardship, and practical problem-solving skills. Our major in Environmental Science with two concentrations in Biology and Geology focuses on deep conceptual knowledge in the natural sciences which prepares students for a variety of scientific careers in government agencies, private consulting, non-profits, and environmental education.

A mid-level, field-intensive course, Field Natural History of the Black Hills (in South Dakota) is required usually in Sophomore summer and is a favorite among students. To build professional skills and experience, a practicum is required, usually in the Sophomore or Junior summer. Faculty-mentored student research is strongly encouraged to build capacity for graduate school. As a result of this powerful combination of theory and experience, nearly 100% of our graduates find placement in either graduate programs or the workplace.

### Environmental Science (BS)

The Bachelor of Science degree with a major in Environmental Science requires 75 hours. *Students may not double major with Sustainable Development. All major courses, including those in the concentration, must be completed with a grade of C- or better and are included in the major GPA.*

#### Core Requirements

BIO 304	4	Field Natural History of the Black Hills
ENS 302	4	Environmental Law and Policy
ENS 383	4	Environmental Ethics
ENS 393	2	Practicum
MAT 210	4	Introductory Statistics
SUS 120	1	Environmental Stewardship and Sustainable Living
SUS 231	4	Environmental Science, Society, and Sustainability

#### Biology Requirements

BIO 202	4	Biology II: Organisms and Diversity
ENS 204	4	Principles of Ecology

Select two of the following courses:

BIO 301	4	Taxonomy of Vascular Plants
BIO 307	4	Vertebrate Natural History
ENS 321	4	Agroecology
ENS 375	4	Systems Ecology

#### Chemistry Requirements

CHE 201	4	General, Organic, and Biochemistry I
CHE 202	4	General, Organic, and Biochemistry II
CHE 320	4	Environmental Pollution and Toxicology

#### Geology Requirements

ENS 241	4	Physical Geology
ENS 355	4	Geospatial Analysis

Select two of the following courses:

ENS 319	4	Principles of Soil Science
ENS 361	4	Geomorphology
ENS 362	4	Hydrogeology

#### Concentrations

Select one of the following concentrations:

##### Biology

Select two courses not previously used from the following:

BIO 301	4	Taxonomy of Vascular Plants
BIO 307	4	Vertebrate Natural History
BIO 331	4	Comparative Anatomy
BIO 471	4	Microbiology and Immunology
ENS 321	4	Agroecology
ENS 375	4	Systems Ecology
SUS 315	4	Food Systems and Society
SUS 325	4	Sustainable Agricultural Development

##### Geology

Select two courses not previously used from the following:

ENS 319	4	Principles of Soil Science
ENS 341	4	Earth Materials
ENS 361	4	Geomorphology
ENS 362	4	Hydrogeology
ENS 364	4	Water Resources and Appropriate Technology
SUS 435	4	Environmental and Sustainability Planning and Assessment

### Environmental Science Minor

The minor in Environmental Science requires 18-20 hours. *Minor not open to Environmental Science, Sustainable Development, or Integrated majors. All major courses must be completed with a grade of C- or better and are included in the major GPA.*

#### Minor Requirements

ENS 383	4	Environmental Ethics
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Select one course from the following:

SUS 200	3	Environment and Society
SUS 231	4	Environmental Science, Society, and Sustainability

Select one course from the following:

ENS 241	4	Physical Geology
GEO 240	3	Introduction to Geology

Select one course from the following:

ENS 302	4	Environmental Law and Policy
SUS 315	4	Food Systems and Society
SUS 435	4	Environmental and Sustainability Planning and Assessment

Select one course from the following:

ENS 204	4	Principles of Ecology
ENS 319	4	Principles of Soil Science
ENS 321	4	Agroecology
ENS 341	4	Earth Materials
ENS 355	4	Geospatial Analysis
ENS 361	4	Geomorphology
ENS 362	4	Hydrogeology
ENS 364	4	Water Resources and Appropriate Technology
ENS 375	4	Systems Ecology
SUS 325	4	Sustainable Agricultural Development

## Public Health

The Public Health majors, established in 2013, reflect the broad and interdisciplinary nature of the profession, and prepare students to serve effectively to a world in need. While uncommon at the undergraduate level, there is a growing national appreciation for the value of teaching public health in liberal arts institutions, where students can be challenged to consider physical, social, economic, cultural and biologic factors that impact the health of populations.

These majors offer a strong set of core courses along with great flexibility to focus elective courses in specific sub-areas of public health. Coursework is designed to be relevant, participatory, experiential, and grounded in a Biblical worldview with a commitment to joining in Christ's redemptive work for all of creation. Students complete a practicum experience that engages them with ongoing public health and community health development work in either the U.S. or abroad in communities experiencing public health problems. Innovative dual majors are encouraged.

Students will be prepared to compete for entrance into graduate programs in public health and related fields, and to effectively work in partnership with communities to address those conditions that produce poor health in populations. We offer both a BS and a BA, as well as a minor.

### Public Health (BA)

The Bachelor of Arts degree with a major in Public Health requires two years of one foreign language and 51-53 hours in the major. *All major courses must be completed with a grade of C- or better and are included in the major GPA.*

#### Major Requirements

PBH 100	3	Introduction to Public Health
PBH 110	3	Global Health
PBH 210	3	Human Diseases
PBH 320	4	Epidemiology
PBH 330	3	Public Health Interventions
PBH 393	3	Practicum
PBH 493	2	Public Health Senior Capstone
POS 331	3	Public Policy

Select one course from the following:

PBH 340*	3	Principles of Community Health Development
PBH 350*	3	Determinants of Health and Health Equity

Select one course from the following:

SUS 200	3	Environment and Society
SUS 231	4	Environmental Science, Society, and Sustainability

Select one course from the following:

MAT 210	4	Introductory Statistics
PSY 330	3	Applied Psychological Statistics
SOC 355	3	Applied Social Statistics

#### Electives

Select 18 hours from any of the following courses. At least 12 hours must be upper-division (300/400 level).

#### Christian Ministries

CAS 340	3	Intercultural Communications
CMI 100	3	Introduction to Christian Educational Ministries
CMI 262	3	Personal Foundations of Ministry
REL 311	3	Foundations of Christian World Mission
REL 391	3	Preparation and Strategy for Christian World Mission
REL 432	3	World Missions Area Studies

#### Economics, Management, and Policy

ECO 201	3	Principles of Microeconomics
ECO 202	3	Principles of Macroeconomics
ECO 442	3	Economic Development
MGT 352	3	Management Analysis and Practice
MGT 442	3	Business Ethics
POS 213	3	International Political Economics
POS 341	3	Issues in Public Administration

#### Social and Behavioral Science

ANT 200	3	Cultural Anthropology
PSY 250	3	Life Span Development
PSY 272	3	Introduction to Research Methods and Data Analysis
PSY 321	3	Social Psychology
PSY 340	3	Adolescent Psychology
PSY 357	3	Peace, Reconciliation, and Justice
PSY 395	3	Health Psychology
PSY 410	3	Motivation
SOC 220	3	Ethnic and Minority Issues
SOC 250	2	Principles of Research and Analysis
SOC 315	3	Social Inequality and Stratification
SOC 350	3	Social Research Methods
SOC 410	3	Community and Urban Affairs
SWK 320	3	Unleashing the Oppressed

#### Natural and Applied Science

BIO 106	4	Human Biology
BIO 203	4	Principles of Genetics
BIO 244	4	Human Anatomy and Physiology I
BIO 245	4	Human Anatomy and Physiology II
BIO 300	4	Medical Physiology
BIO 331	4	Comparative Anatomy
BIO 410	3	Bioethics
BIO 452	4	Animal Physiology
BIO 471	4	Microbiology and Immunology
CHE 201/211	4	General, Organic, and Biochemistry I/College Chemistry I
CHE 202/212	4	General, Organic, and Biochemistry II/College Chemistry II
CHE 320	4	Environmental Pollution and Toxicology
CHE 340	4	Environmental Pollution and Toxicology
ENS 204	4	Principles of Ecology
ENS 355	4	Geospatial Analysis
ENS 364	4	Water Resources and Technology
ENS 383	4	Environmental Ethics
EXS 213	2	Substance Education
EXS 214	3	Health and Sexuality
EXS 215	2	Health, Exercise, and Aging
EXS 217	3	Wellness Programs
EXS 316	3	Applied Nutrition
EXS 346	3	Public and Community Health
KIN 355	3	Research Methods
PBH 340*	3	Principles of Community Health Development
PBH 350*	3	Determinants of Health and Health Equity
SYS 101	3	Introduction to Systems

\*Courses in both areas may only count once

## Public Health (BS)

The Bachelor of Science degree with a major in Public Health requires 58-62 hours in the major. All major courses must be completed with a grade of C- or better and are included in the major GPA.

### Major Requirements

PBH 100	3	Introduction to Public Health
PBH 110	3	Global Health
PBH 210	3	Human Diseases
PBH 320	4	Epidemiology
PBH 330	3	Public Health Interventions
PBH 393	3	Practicum
PBH 493	2	Public Health Senior Capstone
POS 331	3	Public Policy

Select one course from the following:

MAT 210	4	Introductory Statistics
PSY 330	3	Applied Psychological Statistics
SOC 355	3	Applied Social Statistics

Select one course from the following:

BIO 410	3	Bioethics
ENS 383	4	Environmental Ethics
MGT 442	3	Business Ethics
PHI 311	3	Medical Ethics

Select one course from the following:

PBH 340*	3	Principles of Community Health Development
PBH 350*	3	Determinants of Health and Health Equity

Select two courses from the following:

ENS 204	4	Principles of Ecology
ENS 375	4	Systems Ecology
SYS 101	3	Introduction to Systems

Select one course from the following:

SUS 200	3	Environment and Society
SUS 231	4	Environmental Science, Society, and Sustainability

### Electives

Select 12 credits from one of the following categories. Select an additional 3 credits from any category below.

#### Natural and Applied Science Electives

BIO 106	4	Human Biology
BIO 203	4	Principles of Genetics
BIO 244	4	Human Anatomy and Physiology I
BIO 245	4	Human Anatomy and Physiology II
BIO 300	4	Medical Physiology
BIO 331	4	Comparative Anatomy
BIO 452	4	Animal Physiology
BIO 471	4	Microbiology and Immunology
CHE 201/211	4	General, Organic, and Biochemistry I/College Chemistry I
CHE 202/212	4	General, Organic, and Biochemistry II/College Chemistry II
CHE 320	4	Environmental Pollution and Toxicology
CHE 340	4	Environmental Pollution and Toxicology
ENS 355	4	Geospatial Analysis
ENS 362	4	Hydrogeology
ENS 364	4	Water Resources and Technology
EXS 213	2	Substance Education
EXS 214	3	Health and Sexuality
EXS 215	2	Health, Exercise, and Aging
EXS 217	3	Wellness Programs
EXS 316	3	Applied Nutrition
EXS 346	3	Public and Community Health
KIN 355	3	Research Methods
PBH 340*	3	Principles of Community Health Development
PBH 350*	3	Determinants of Health and Health Equity
SUS 435	4	Environmental and Sustainability Planning and Assessment

#### Economics, Management, and Policy Electives

ECO 201	3	Principles of Microeconomics
ECO 202	3	Principles of Macroeconomics
ECO 442	3	Economic Development
MGT 352	3	Management Analysis and Practice
POS 213	3	International Political Economics
POS 341	3	Issues in Public Administration

#### Social and Behavioral Science Electives

ANT 200	3	Cultural Anthropology
PSY 250	3	Life Span Development
PSY 272	3	Research in Psychology
PSY 321	3	Social Psychology
PSY 340	3	Adolescent Psychology
PSY 357	3	Peace, Reconciliation, and Justice
PSY 395	3	Health Psychology
PSY 410	3	Motivation
SOC 220	3	Ethnic and Minority Issues
SOC 250	2	Principles of Research and Analysis
SOC 315	3	Social Inequality and Stratification
SOC 350	3	Social Research Methods
SOC 410	3	Community and Urban Affairs
SWK 320	3	Unleashing the Oppressed

\*Courses in both areas may only count once

## Public Health Minor

A minor in Public Health consists of 25-27 hours. All major courses must be completed with a grade of C- or better and are included in the major GPA.

### Major Requirements

PBH 100	3	Introduction to Public Health
PBH 110	3	Global Health
PBH 210	3	Human Diseases
PBH 320	4	Epidemiology
PBH 330	3	Public Health Interventions
POS 331	3	Public Policy

Select one course from the following:

SUS 200	3	Environment and Society
SUS 231	4	Environmental Science, Society, and Sustainability

Select one course from the following:

MAT 210	4	Introductory Statistics
PSY 330	3	Applied Psychological Statistics
SOC 355	3	Applied Social Statistics

## Sustainable Development

Sustainable Development, established in 2015, provides interdisciplinary training for solving global sustainability problems in U.S. and international settings. Students build a broad foundational understanding of the interactions of the three spheres of sustainability—environment, economics, and society. By studying at the nexus of these subjects, students develop a holistic understanding of key issues facing humanity and the environment. Students gain depth in a specific area by focusing on a concentration that connects their passion for studies with their desire to help people.

In this program, students take core courses in sustainability, environmental science, sociology, public health, and economics and choose one of the following concentrations: Public and Environmental Health, Sustainable Agriculture, or Water Resources. An international, field-based course during January interterm enables students to experience and apply what they have been learning. Near the end of the curriculum each student participates in a field-based development project through a required practicum and a senior capstone experience involving a group research project on a local, real-world issue.

### Sustainable Development (BS)

The Bachelor of Science degree with a major in Sustainable Development requires 66 hours. *Students may not double major with Environmental Science. All major courses, including those in the concentration, must be completed with a grade of C- or better and are included in the major GPA.*

#### Core Requirements

ENS 302	4	Environmental Law and Policy
ENS 355	4	Geospatial Analysis
ENS 383	4	Environmental Ethics
PBH 110	3	Global Health
SUS 120	1	Environmental Stewardship and Sustainable Living
SUS 231	4	Environmental Science, Society, and Sustainability
SUS 310	4	Principles of Sustainable Development
SUS 393	2	Practicum
SUS 435	4	Environmental and Sustainability Planning and Assessment

#### Economics Requirements

ECO 201	3	Principle of Microeconomics
SUS 370	3	Special Topics (advisor approval)

#### Environmental Science Requirements

ENS 204	4	Principles of Ecology
ENS 241	4	Physical Geology

#### Sociology and Anthropology Requirements

ANT 200	3	Cultural Anthropology
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Select one of the following courses:

SOC 100	3	Introduction to Sociology
SOC 110	3	Introduction to Global Societies

**In addition, the major requires one of the following concentration areas:**

#### Public and Environmental Health

PBH 100	3	Introduction to Public Health
PBH 320	4	Epidemiology
PBH 330	3	Public Health Interventions
PBH 340	3	Principles of Community Health Development
PBH 350	3	Determinants of Health and Health Equity

#### Sustainable Agriculture

ENS 319	4	Principles of Soil Science
ENS 321	4	Agroecology
SUS 315	4	Food Systems and Society
SUS 325	4	Sustainable Agricultural Development

#### Water Resources

CHE 320	4	Environmental Pollution and Toxicology
ENS 361	4	Geomorphology
ENS 362	4	Hydrogeology
ENS 364	4	Water Resources and Appropriate Technology

### Environmental Science Courses

#### ENS 170 1-4 hours

##### Selected Topics

A course offered on a subject of interest but not listed as a regular course offering.

#### ENS 201 4 hours

##### Introduction to Geology in the Field

Introduction to earth's materials, processes, and history as discovered through field observations of minerals, rocks, fossils, strata, caves, rivers, canyons, and mountains. Emphasis is placed on field experiences and observations, complemented by study of maps, laboratory work, and discussions. Offered during select summers at the Black Hills Science Station near Rapid City, South Dakota.

#### ENS 204 4 hours

##### Principles of Ecology

An introduction to the relationships existing between organisms and their environment. Lectures focus on the structural and functional aspects of populations, communities, and ecosystems in the context of the major North American biomes. Three hours lecture and two hours laboratory per week. *Does not normally satisfy foundational core science requirement. Prerequisite: Four hours of BIO or ENS or permission of the instructor.*

#### ENS 241 4 hours

##### Physical Geology

A general introduction to the earth's internal and external physical, dynamic systems. Topics include occurrence and formation of minerals and rocks, processes that shape the earth's surface, and the internal structure and dynamics that lead to plate tectonics and crustal deformation. Special emphasis is placed on the environmental aspects of humans' interaction with the earth. Three hours of lecture and two hours of lab per week. *Meets foundational core earth science requirement.*

#### ENS 242 4 hours

##### Geology of Indiana

An introduction to the concepts of physical and historical geology in the context of Indiana. Topics include rocks, fossils, structure, landforms, and earth and environmental resources of the state. Offered during summer session and includes a required field trip to several regions of Indiana for field observation and collection of mineral, rock, and fossil specimens. *Meets foundational core earth science requirement.*

#### ENS 270 1-4 hours

##### Selected Topics

A course offered on a subject of interest but not listed as a regular course offering.

#### ENS 302 4 hours

##### Environmental Law and Policy

Lectures introduce the major elements of U.S. environmental law: NEPA, EIS, CAA, CWA, RCRA, CERCLA, TSCA, FIFRA and CRTK. The administrative process, cost/benefit analysis and the role of litigation in enforcement are also discussed. Presentation techniques and debate skills are introduced. Three hours of lecture and a discussion section per week. *Prerequisite: Senior environmental science majors and minors or permission from the instructor.*

#### ENS 319 4 hours

##### Principles of Soil Science

An introduction to soil science with an emphasis on soil formation and taxonomy in the context of the landscape. Soil physical properties, water relations, and chemistry and biological properties will be the central focus. Special emphasis is placed on human interaction with the soil resource. Agricultural and current environmental issues as they relate to the soil resource are addressed. Lab exercises focus on the analysis of basic soil physical and chemical properties. Soil fertility and conservation are additional lab topics. *Prerequisite: SUS 200 or 231.*

**ENS 321** 4 hours  
**Agroecology**  
Ecological concepts and principles are applied to the design and management of sustainable agroecosystems. This course enables students to analyze the environmental, social, and economic interconnections within various types of agricultural systems locally and globally. Labs feature interdisciplinary approaches to agroecosystem design, management, analysis, and evaluation. *Prerequisite: SUS 231.*

**ENS 341** 4 hours  
**Earth Materials**  
Basic principles of mineralogy and petrology, with emphasis placed on description, identification, classification, and interpretation of rock-forming minerals and the igneous, sedimentary, and metamorphic rocks they comprise. Also includes origin and occurrence of earth materials and their uses in economic and environmental contexts. Lab emphasizes observation of hand specimens and some thin-sections. Three hours of lecture and the equivalent of two hours of lab per week, including field trips to selected locations throughout the state. *Prerequisite: ENS 241 or permission from the instructor.*

**ENS 355** 4 hours  
**Geospatial Analysis**  
An introduction to methods of collection, management and analysis of geospatial data. Topics include basic map properties, preparation and interpretation of thematic and topographic maps, analysis of aerial photographs, surveying by traditional and global positioning systems (GPS) techniques, and acquisition of remotely-sensed satellite data. Special emphasis is placed on methods and applications of geographic information systems (GIS) in geospatial analysis. *Prerequisite: ENS 241 or SUS 200 or SUS 231.*

**ENS 360** 1-4 hours  
**Independent Study**  
An individualized, directed study involving a specified topic.

**ENS 361** 4 hours  
**Geomorphology**  
An applied approach to the study of earth surface processes and the landforms they produce. Topics include processes and landforms associated with weathering, mass wasting, rivers, karst, tectonics, glaciers, shorelines, and wind. Emphasis placed on environmental and land-use applications. Field and lab assignments include qualitative descriptions and quantitative measurements from fieldwork, topographic and geologic maps, and aerial photographs. Three hours of lecture and three hours of lab per week. *Prerequisite: ENS 241 or permission from the instructor.*

**ENS 362** 4 hours  
**Hydrogeology**  
Basic processes and measurement of the hydrologic cycle, including precipitation, evaporation, surface runoff, stream flow, soil moisture, and groundwater. Emphasis placed on groundwater, including aquifer characteristics, principles of flow, conceptual models of regional flow, geology of occurrence, well hydraulics, chemistry and quality, detection of pollutants, contaminant transport and remediation, and resource development. Three hours of lecture and three hours of lab per week. *Prerequisites: ENS 241 or permission from the instructor.*

**ENS 364** 4 hours  
**Water Resources and Appropriate Technology**  
Concepts and practices of water resource development and appropriate technology in the context of environmental resources in a developing country. Students participate in a service-learning project of design and implementation of water resource related appropriate technology (such as well-drilling, water quality protection, hygiene training, and sanitation system design) as part of a holistic ministry toward transformational development. Students develop a perspective on the role of appropriate technology in the responsibility of individuals in cross-cultural service, in issues of cross-cultural communication and interactions, and in God's purposes in missions and the worldwide church. *Prerequisite: IAS 120.*

**ENS 370** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**ENS 375** 4 hours  
**Systems Ecology**  
The principles of systems theory are introduced in an integrated study of the development, dynamics, and disruption of natural ecosystems. Theoretical, analytical, and experimental aspects of ecosystems are explored. Students are introduced to the use of microcomputers as a tool in ecosystem modeling. *Prerequisites: ENS 204 and one course in college-level mathematics or computer science.*

**ENS 383** 4 hours  
**Environmental Ethics**  
An in-depth discussion of the ethical implications of major environmental problems, such as world population and food supply, inequities in land and resource distribution, animal rights, materialism and personal life styles, and exploitation versus stewardship of the environment. Three hours of lecture and a discussion section per week. *Prerequisite: Junior/senior ENS majors or permission from the instructor.*

**ENS 393** 1-4 hours  
**Practicum**  
Supervised learning involving a first-hand field experience or a project. Generally, one hour of credit is awarded for a minimum of 40 hours of practicum experience. *Offered primarily during summer.*

**ENS 450** 1-4 hours  
**Directed Research**  
Investigative learning involving closely directed research and the use of such facilities as the library or laboratory.

**ENS 480** 1-4 hours  
**Seminar**  
A limited-enrollment course designed especially for upper-class majors with emphasis on directed readings and discussion.

**ENS 490** 1-2 hours  
**Honors**  
Individualized study or research of an advanced topic within a student's major. *Open to students with at least a 3.00 GPA in the major field.*

## Public Health Courses

**PBH 100** 3 hours  
**Introduction to Public Health**  
This course is a foundational course for the major and an elective for students wishing only to be introduced to the field. The course is built upon a population perspective and ecological perspective on disease causation and prevention. As a general overview of the field, Introduction to Public Health provides an historical perspective on the role that public health has played in improving the health status of populations, both in the US and globally. Moving beyond the biologic mechanisms of disease causation, students will gain an understanding of the environmental, social and behavioral determinants of health for populations, and factors that contribute to disparities in health between subpopulations. Students will be introduced to the core functions and essential services of public health in the US and how these are met in less economically developed societies. The core disciplines of public health will be defined and described, including epidemiology, biostatistics, environmental health, policy and administration, and the social and behavioral sciences. Students will examine current public health challenges in the US and globally.

**PBH 110** 3 hours  
**Global Health**  
This course provides an overview of the determinants of health, burden of disease, risk factors, health systems, and key measures to address the burden of disease in populations for both industrialized and less developed nations. The course will have a global perspective, paying particular attention to links between health and development, environment, human rights, and culture.

**PBH 170** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**PBH 210** 3 hours  
**Human Diseases**  
Introduction to biomedical concepts associated with human diseases. Emphasis is on understanding the etiology, pathogenesis, diagnosis, treatment, and risk factors of diseases affecting public health and how this impacts the prevention and control of those diseases. *Offered fall semester. Prerequisites: PBH 100 or 110.*

**PBH 270** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**PBH 320** 4 hours  
**Epidemiology**  
Study of the distribution and determinants of disease occurrence, including core concepts such as incidence, prevalence, risk, risk factors, relative risk, attributable risk, sensitivity, specificity, and different types of epidemiologic study designs. Students will use data from epidemiologic case studies to calculate odds ratios, relative risk, and confidence intervals as well as calculate sensitivity and specificity of screening tests. *Offered spring semester. Prerequisites: PBH 100; MAT 210 or SOC 355 or PSY 330.*

**PBH 330** 3 hours  
**Public Health Interventions**  
This course will examine intervention approaches in public health for the prevention of infectious disease, chronic disease, injury and disability, and the promotion of community health and wellbeing. Intervention approaches through environmental change, policy and systems change, social change, and behavioral change approaches will be studied. Case studies of interventions will be examined. Offered fall semester. Prerequisites: PBH 100.

**PBH 340** 3 hours  
**Principles of Community Health Development**  
The course will cover the theory and practice of community health development, including key principles related to working in communities toward transformational development. Models of faith based community health development will be examined in the contexts in which they occur. The course will include a service component and discussions of those experiences will emphasize intercultural competencies. Offered interterm. Prerequisites: PBH 100, 110, and 330.

**PBH 350** 3 hours  
**Determinants of Health and Health Equity**  
The focus of this course will be on examining the broad range of environmental, social, cultural, and policy factors that contribute to disparate outcomes between population groups. This course will introduce students to the literature and methods of social epidemiology. Structured in a seminar format, with readings and case studies, students will examine specific cases of disparate health outcomes within communities including an analysis of the determinants of those disparities. Approaches to health equity will be discussed. Offered spring semester. Prerequisites: PBH 100 and 320; MAT 210 or SOC 355 or PSY 330.

**PBH 360** 1-4 hours  
**Independent Study**  
An individualized, directed study involving a specified topic.

**PBH 370** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**PBH 393** 1-4 hours  
**Practicum**  
Supervised learning involving a first-hand field experience or a project. Generally, one hour of credit is awarded for a minimum of 40 hours of practicum experience. Offered primarily during summer following junior year or fall of senior year. Prerequisites: PBH 100, 110, 210, 320, 330, 340 and 350.

**PBH 450** 1-4 hours  
**Directed Research**  
Investigative learning involving closely directed research and the use of such facilities as the library or laboratory.

**PBH 480** 1-4 hours  
**Seminar**  
A limited-enrollment course designed especially for upper-class majors with emphasis on directed readings and discussion.

**PBH 490** 1-2 hours  
**Honors**  
Individualized study or research of an advanced topic within a student's major. Open to students with at least a 3.00 GPA in the major field.

**PBH 493** 2 hours  
**Public Health Senior Capstone**  
This course will be structured as a seminar, pulling together the experiences of all the students into a broad public health framework. Major challenges faced during practicum will be discussed. Readings, videos, guest lectures, and optional workshops will support the discussions that take place in class. An integrative senior paper will provide the structure for students to integrate their faith, public health coursework, and practicum experiences. Part of the comprehensive exam, paper, or project required for graduation will be completed during the practicum. Offered spring semester. Prerequisites: PBH 100, 110, 210, 320, 330, 393; PBH 340 or 350.

## Sustainable Development Courses

**SUS 120** 1 hour  
**Environmental Stewardship and Sustainable Living**  
Key topics related to stewardship and sustainable living are presented in a weekly seminar. Guest lecturers and discussions are focused on aspects of ecological and social sustainability and its application in daily life and on campus.

**SUS 170** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**SUS 200** 3 hours  
**Environment and Society**  
Introduction to ecological principles and human impacts on the environment. Issues studied include population dynamics, natural resources, pollution problems, and environmental ethics. Lab exercises focus on experimental ecology and the basic techniques used to describe and measure environmental quality. Meets the foundational core life science requirement. Environmental science majors should elect SUS 231 rather than SUS 200.

**SUS 231** 4 hours  
**Environmental Science, Society, and Sustainability**  
An introduction to environmental science, including a discussion of ecological principles and their application, energy systems, pollution problems, environmental policy and decision making, and the scientific and ethical implications of human impacts on the environment. Lab exercises focus on experimental ecology and the basic techniques used to describe and measure environmental quality. This course serves three functions: (1) it is the entry level course for environmental science majors; (2) it may be taken for foundational core lab science credit; and (3) biology majors may count it as a 200-level biology course when calculating course hour requirements in biology. Three hours of lecture and two hours of lab per week. Meets the foundational core life science requirement.

**SUS 270** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**SUS 310** 4 hours  
**Principles of Sustainable Development**  
An exploration of the key ideas and debates in development theory with an emphasis on evaluating whether and how global poverty can be alleviated without irreparably damaging the environment. Labs feature interdisciplinary approaches to sustainable and transformational development drawn from agroecology, sociology, public health, holistic missions, and political economy. Prerequisite: SUS 231.

**SUS 315** 4 hours  
**Food Systems and Society**  
The history, drivers, and context of contemporary domestic and international food system issues are examined. Course explores different approaches to building community-based food systems and movements for food justice around the world. Labs will feature interdisciplinary approaches to food system analysis and evaluation. Prerequisite: SUS 231.

**SUS 325** 4 hours  
**Sustainable Agricultural Development**  
This field-based course explores contemporary trends in international development through the lens of sustainable agriculture. The social, ecological, and economic sustainability of agriculture and food systems are assessed through a case-study approach. Prerequisites: ENS 241, ENS 321, and SUS 310.

**SUS 360** 1-4 hours  
**Independent Study**  
An individualized, directed study involving a specified topic.

**SUS 370** 1-4 hours  
**Selected Topics**  
A course offered on a subject of interest but not listed as a regular course offering.

**SUS 393** 1-4 hours  
**Practicum**  
Supervised learning involving a first-hand field experience or a project. Generally, one hour of credit is awarded for a minimum of 40 hours of practicum experience. Offered primarily during summer.

**SUS 435** 4 hours  
**Environmental and Sustainability Planning and Assessment**  
A culminating course involving application of interdisciplinary principles of environmental and sustainability planning, monitoring, and evaluation involving community-based projects and case studies.

**SUS 450** 1-4 hours  
**Directed Research**  
Investigative learning involving closely directed research and the use of such facilities as the library or laboratory.

**SUS 480** 1-4 hours  
**Seminar**  
A limited-enrollment course designed especially for upper-class majors with emphasis on directed readings and discussion.

**SUS 490** 1-2 hours  
**Honors**  
Individualized study or research of an advanced topic within a student's major. Open to students with at least a 3.00 GPA in the major field.