**Sustainability course inventory 2014-2015**

**Definition for Sustainability in the Curriculum at Wittenberg:**

Wittenberg aligns its goals for sustainability education with the Brundtland report’s definition of sustainability: meeting the needs of the present generation without compromising the ability of future generations to meet their needs.  Addressing sustainability challenges requires interdisciplinary thinking, flexibility, creativity, and ongoing collaboration.  Sustainability courses can fall into the following two categories:

        Sustainability-focused courses concentrate on the concept of sustainability, including its social, economic, and environmental dimensions, or examine an issue or topic using sustainability as a lens.

        Sustainability-related courses incorporate sustainability as a distinct course component or module or concentrate on a single sustainability principle or issue.

To help identify if a course incorporates sustainability either as a central focus or as a module, several sample sustainability learning outcomes follow:

Students will be able to:

       Demonstrate an understanding of key sustainability challenges.

       Understand interdisciplinary aspects of sustainability including the feedbacks between science, economics, society and/or cultural influences.

       Approach sustainability topics through team activities that encourages multiple disciplinary lenses.

       Critically engage in problem-solving related to sustainability (e.g. case studies, field studies, evaluations of best practices, research).

A course does not need to include all of the above learning outcomes to be considered sustainability-focused or sustainability-related and the above list is far from comprehensive.

Sustainability-focused courses

**BIOL 104N – Plants, People and the Environment**  
**4 semester hours**

Without the advent of agriculture, particularly the farming of plant crops, human society and culture as we know it would not exist.  This is a non-majors course that introduces students to how humans use plants and focuses on increasing students’ scientific literacy.  About a third of this course will be examining plant biology--in particular plant diversity, structures and experiments that allow us to understand processes in plants.  The other two thirds of the course will examine plants’ importance to human society and the conservation issues that threaten both our crop plants and our native plant populations.

**ECON 350. Environmental and Natural Resource Economics. 4 semester hours.**

Examines economic approaches to coping with environmental problems and natural resource scarcity. Emphasis is given to the clear definition and enforcement of property rights as a means to avoid environmental problems. Models for pricing various renewable and nonrenewable natural resources are explored. The role of population change in environmental and natural resource issues is considered. Prerequisites: Economics 190 and Mathematics 120 or its equivalent. Writing intensive. Alternate years.

**ESCI 100N. Global Climate Change. 4 semester hours.**

This course will examine the science of global climate change and human-introduced climate forcing. It will survey the environmental impacts of global climate change and what this means for the habitability of the earth for humans and other species. Topics will include global climate, stakeholder analysis related to energy use and global climate change, and examining the consequences of rapid climate change. Students will investigate a climate change issue of importance to them (locally, regionally, or globally). The course is designed primarily for non-science majors. Prerequisite: Math placement score 22.

**GEOL 170B. Geology of the Critical Zone. 5 semester hours.**

A transdisciplinary examination of Earth's critical zone, the intersection between the geosphere, the biosphere, and the hydrosphere.  Humans greatly alter processes in this zone of important biogeochemical interactions.  This course will be of interest to students wanting to explore natural environmental processes as well as those altered by humans (e.g., pristine vs. polluted, short- and long-term controls on carbonclimate cycles).  This course is for sciences majors and includes a laboratory component.

**PHIL 207. Science in Social Context. 4 semester hours.**

The course focuses on sustainable science broadly construed to include studying environmental racism and environmental justice, as well as what it means to have sustainable science. Though this aspect of it is not an environmental focus, it includes what it means to have an epistemologically and practically sustainable scientific practice.

Sustainability-related courses

**BIOL 146N – Biology on the Big Screen  
4 semester hours**

This course will address the accuracy with which movies, TV shows, and media outlets portray biological concepts underlying important contemporary issues.  The course will focus on four main topics: emerging infectious diseases, global climate change, genetic modification, and biodiversity. Students will gain an understanding of the biological principles and concepts that underpin these often contentious and frequently debated issues. The course will use primary literature and current research within the field to give students an increased scientific awareness and improved scientific literacy. Movie viewings outside of scheduled class times will be required.

**BIOLOGY 148N - Biology in a Changing World**  
**(4 semester hours)**

Our planet is currently experiencing a global biodiversity crisis; extinction rates at present are at least 100 times that of any natural extinction event to have ever occurred in our history. Humans are a driving force in the loss of earth’s species and the degradation of ecosystems. Undoubtedly, biological interactions and critical processes may be dramatically altered in our rapidly changing world. This biology course for non-majors will explore patterns that have historically impacted global biodiversity, how human induced alterations such as climate change and habitat loss are threatening the biodiversity of species, the implications of a widespread loss in biodiversity for humans, and the ability of current or future conservation practices to shape our fate. The course will draw heavily from empirical research and case studies to highlight the predicament of unfortunate species which are currently facing a very uncertain future.

**BIOL 242 – Behavioral Ecology**  
**5 semester hours**

**Prerequisites:  Biology 170 and 180**  
This course will explore how the behavior of organisms contributes to survival and reproductive success of individuals. We will examine the evolution and significance of a wide variety of animal behaviors including life history strategies, foraging decisions, sexual selection and mate choice, cooperation and altruism, parental care, and predator-prey dynamics.   This course will draw heavily from primary literature and empirical research of animal behaviors, with an emphasis on current methodology and experimental design. The course will combine weekly discussions, lectures, and labs to provide an overview of the past, present and future of the field of behavioral ecology. A semester-long project will require student groups to design and conduct an observational or manipulative experiment on some aspect of behavioral ecology and present these results in the form of a manuscript and a 15 minute conference style presentation.  This course fulfills Group 4 and Zoological requirements for biology majors. Writing intensive.

**BIOLOGY 250 – Conservation Biology**  
**(5 semester hours)**

Conservation biology is focused on the conservation of biological diversity at the population, species, ecosystem, and global levels.  To achieve this, conservation biologists draw on principles from ecology, small population biology, environmental science, and population genetics.  In this course, students will learn key principles from each of these fields and how they are used to assess, protect, and restore threatened populations, species, and communities.  During labs, students will learn field and lab based skills as well as management techniques commonly used by conservation biologists.

**BIOL 250 – Topic: Conservation Genetics**  
**5 semester hours**

There are many threats (e.g. habitat fragmentation, climate change, and invasive species) to our global biodiversity that cause a reduction in population size and often local or global extinction of a species.  As populations get smaller, genetic diversity can be eroded and mating between related individuals can lead to inbreeding depression.  Conservation Genetics is a field of study that examines how to quantify, preserve, and restore genetic diversity of threatened populations and species.  Research has demonstrated that restoration and reintroduction efforts that take genetics into account are more likely to be successful than those that do not.  In lecture, students will learn principles from population, quantitative, and molecular genetics that are used to conserve and restore populations.  Labs will focus on methods and genetic tools needed to quantify and assess the genetic diversity in populations and species.  The primary focus will be on molecular genetic tools, but greenhouse and computer based labs will also be utilized.

**BUSI 290C. Topics in Business: Global Leadership and Social Entrepreneurship (GLSE) in East Asia. 4 semester hours.**

With the traditional lines between for-profit enterprise, nonprofit enterprise, and government beginning to blur, it is critical that students understand the opportunities and challenges presented by the new “blended” landscape of global economy. This introductory course will explore this emerging, highly interdisciplinary field of social entrepreneurship through a combination of instructor lecture, class discussion, student inquiry, case analysis, social venture business plan and global competition participation. This class highlights how social enterprises and challenges in East Asia differ from that of Western European and American. Students will work on social venture business plan in this class and selected students will travel to participate in a global social venture competition.

**CHEM 162B. Chemical Structure and Analysis. 5 semester hours.**

Follows Chemistry 121 and introduces the student to simple kinetics, equilibrium, more acid-base chemistry, simple thermodynamics and electrochemistry, basic wet and instrumental analytical techniques, a selected survey of elements of the main group, and transition metals and their compounds. Weekly laboratory emphasizing analytical techniques and inorganic synthesis required. Prerequisites: Chemistry 121 and Mathematics 120 as a pre- or co-requisite. Every year. Note: Students with strong high school chemistry backgrounds or international students with strong science backgrounds should consult with the Chair of the Department about placing out of this course.

**ESCI 101B. Introduction to Environmental Science. 5 semester hours.**

An introduction to environmental science, including concepts used by environmental scientists to frame the study of environmental problems and human impacts on the natural environment and its resources, including climate, water, soils, vegetation, and wildlife.  The laboratory experience focuses on the tools and methods used by environmental scientists to study the environment, natural resources, and human impacts associated with the extraction and use of resources.

**ESCI 250B. Environmental Research Methods. 5 semester hours.**

Study and application of the methods environmental scientists use to investigate environmental questions, including sampling strategies, tools, sample collection and analysis, and presentation.  Prerequisites:  ESCI 101 and one additional course from the foundational courses approved for the environmental sciences major.

**GERM 261: Umwelt: Natur und Kultur (Environment: Nature and Culture): 2 semester hours**

This is a content-based reading and conversation course that focuses on the role of the natural environment in the lives of contemporary Germans; it explores some of the distinctive ways in which those Germans express their regard and concern for the natural world. Prerequisite: successful completion of German 112 or placement. Alternate years.

**NUR 404 Concepts in Community Health Nursing: 4 semester hours.**

**Prerequisite: Permission required**

Study of community health nursing theories and principles applied to the nursing care of

individuals, families, groups, communities and populations. *@witt/@home* format.

**RELI 378R. Bioethics. 4 semester hours.**

Seminar on contemporary issues and debates in bioethics. Topics may include abortion, genetic engineering, reproductive technologies, euthanasia, autonomy, paternalism, use of human subjects in research, access to health care, allocation of scarce resources and environmental ethics. Writing intensive. Every year.

**SPAN 261. El mundo físico (The Physical World) 2 sem. hr.**

This course serves as an introduction to the Hispanic world by highlighting the diverse nature and cultures of Spanish-speaking people focusing on climate, geography and environmental issues. The course will also develop language skills that will enhance student’s ability to express themselves in Spanish. Prerequisite: Spanish 112 or Spanish 150 or placement at the 200  
level. Every year.