CONCENTRATION IN ENVIRONMENTAL STUDIES
(Dr. A. Hussen and Dr. B. Girdler, Directors)

The concentration in environmental studies is based upon the recognition that environmental and resource problems are not just biological, geological, economic, or political. Therefore, the concentration is structured as an interdisciplinary study by selecting appropriate courses from the natural and social sciences, as well as the humanities, in order to pool knowledge from across traditional disciplinary lines. This information is essential for an interdisciplinary assessment, analysis and evaluation of environmental problems. Specifically, satisfactory completion of the concentration will require at least six courses from those listed below.

Core Courses (4): Required for all concentrators, 1 from each of the following.

A.	BIOL 115:	Environmental Science or
	BIOL 124:	Physiological Ecology w/ Lab
B.	CHEM 101:	Chemistry and Society or
	CHEM 105:	The Physical Earth or
	CHEM 120:	Introductory Chemistry II w/ Lab
C.	ECO 235:	Environmental & Resource Economics *
		* has a prerequisite of ECON 105
D.	ENVS 490:	Environmental Studies Senior Seminar

Required electives consisting of at least two of the following courses:

BIOL 212 Population and Community Ecology w/ Lab
BIOL 230 Microbiology and Microbial Ecology w/ Lab
CHEM 240 Analytical Chemistry w/Lab
CHEM 250 Chemical Analysis w/Lab
CHEM 420 Instrumental Analysis w/ Lab
HIST 206 Culture and Society in Victorian America (2003-04 and alternate years)
PHIL 108 Environmental Ethics (2004-05 and alternate years)
POLS 2XX Public Policy: Environmental Policy
SOAN 310 Social Research for Social Change (if topics relate to environmental issues; please contact instructor or ENVS directors)

Special Note: Students interested in pursuing the Concentration in Environmental Studies are urged to keep this preference in mind when selecting a site for Study Abroad. Certain courses taken at selected Kalamazoo foreign study centers (*e.g*, the Environmental Studies Programs in Costa Rica, Ecuador, Thailand, or Zimbabwe) can be counted toward the concentration. Those who are interested in these options should consult with the co-directors of the concentration and the Center for International Programs before making final decisions on which courses to take. Up to one unit of such credit may be applied to the concentration if pre-approved by the co-directors.

COURSE DESCRIPTIONS:

BIOL 115 Environmental Science. In this course you will (1) build a basic understanding of the physical and natural systems that make up the biosphere on Earth (land, water, atmosphere, and life) stressing the dynamics of these interconnected systems; (2) develop a scientific understanding of the causes and consequences of several of the major environmental problems facing today's society; (3) acquire the tools to enable you to think critically about other current and future environmental challenges you will face as a member of contemporary society. One weekend field trip is required.

BIOL 124 Physiological Ecology with Lab. Introduction to principles of organism-environment interaction, how organisms meet environmental requirements, and community and ecosystem dynamics. Recommended prerequisite: BIOL 112.

BIOL 212 Population and Community Ecology with Lab. This course will build upon principles studied in BIOL 124. Using both theoretical and empirical approaches, we will explore in greater depth: population ecology, demography, life history strategies, species interactions, community structure and dynamics for both aquatic and terrestrial communities. Labs will focus on the methods ecologists use to answer questions about the distribution and abundance of organisms; students will explore local habitats and conduct independent research. Prerequisite: BIOL 124. Recommended: BIOL 112.

BIOL 230 Microbiology and Microbial Ecology with Lab. A general overview of microbiology is provided to set the stage for exploration of interactions among microorganisms, the roles of microorganisms in biogeochemical cycles, and the importance of microorganisms in maintaining environmental quality and public health. Aspects of medical microbial ecology will be included. Prerequisite: BIOL 112 or BIOL 124.

CHEM 101 Chemistry and Society. Introductory course for students who wish to explore chemistry. Topics include energy, the atmosphere, water, nuclear energy, and genetic engineering. Intended for students who are not majoring in the natural sciences or for Environmental Studies concentrators.

CHEM 105 The Physical Earth. Introduction to an integrated structural, geochemical, and geophysical description of the Earth: emphasis on the interaction of the planet's solar and internal heat engines considered from the perspective of plate tectonics; historical origins of the current view of the Earth's structure and dynamics; laboratory component includes a field project. Intended primarily for students who are not majoring in the natural sciences, for Environmental Studies concentrators, and for students intending to teach Earth Sciences in high schools.

CHEM 120 Introductory Chemistry II with Lab. Classification of chemical reactions; chemical kinetics; chemical equilibrium; energetics of chemical reactions (thermodynamics); acid-base, solubility precipitation, oxidation-reduction, complexation reactions; electrochemistry; descriptive chemistry of selected elements. Laboratory work includes use of chemical instrumentation. Prerequisite: CHEM 110.

CHEM 240 Analytical Chemistry with Lab. Treatment of experimental data; systematic solution stoichiometry; the study of acid-base, precipitation-solubility, oxidation-reduction, and complex formation dissociation equilibria; introduction to quantitative applications of gravimetry, titrimetry, and chromatography, electrochemistry, and spectophotometry. Intended for research-oriented natural science students with career interests in chemistry, chemical engineering, and related fields. Prerequisite: CHEM 120.

CHEM 250 Chemical Analysis with Lab. Study of the topics covered in CHEM 240 but with greater emphasis on biological, environmental, and clinical applications. Prerequisite: CHEM 120

CHEM 420 Instrumental Analysis with Lab. Study of instrumental methods of analysis including trace techniques; emphasis on spectroscopy, electrochemistry, and chromatography, introduction to electronic signal processing, and computer data acquisition. Prerequisite: CHEM 240 and 310 or permission.

ECON 235 Environmental and Resource Economics. Study of the economic perspective of environmental and resource problems and issues; the management and allocation of renewable and nonrenewable resources; the trade-off between economic growth and environmental amenities; and the impacts of natural resource availability on economic growth. Emphasis on the development and application of economic theory to contemporary natural resource issues. Prerequisites: ECO 105.

ENVS 490 Environmental Studies Seminar. Examination and analysis of selected contemporary environmental and resource problems and issues from an interdisciplinary perspective. In addressing these issues, special attention is given to the application and integration of principles, theories and analytical techniques introduced in the core courses. The seminar cannot be used to satisfy an area study requirement. Topics covered in the seminar are likely to vary annually as new problems, policies and solutions emerged. Prerequisite: Senior status or permission of the instructor.

HIST 206 Culture & Society in Victorian America. Consideration of the main tenets of Victorian culture as reflected in important works of the period. Special attention will be given to reaction to the industrial revolution and its impact on in natural and social environment, racial and gender relation, and organized religion.

PHIL 108 Environmental Ethics. This course investigates the question of our understanding of, and ethical responsibility to, animals, plants, microorganisms, non-living beings, ecosystems, and "nature" as a whole. The first part of the course critically examines the adequacy of traditional ethical theories in grounding environmental responsibilities. The second part critically examines Western conceptions of nature and humankind and their implications for our treatment of the environment. Contemporary positions such as anthropocentrism, deep ecology, radical ecology, ecofeminism, and social environmentalism will be discussed. Recommended for environmental studies students.

POLS 2XX Environmental Policy. Please contact instructor for course description.

SOAN 310 Social Research for Social Change. Please contact instructor for current topics.

Additional relevant courses (but not applicable to completion of the concentration) include: BIOL 182, 296; COMP 105 or 110; ECON 240, 412; MATH 260, 360