**General Education Course Inclusion Proposal**

**INTEGRATIVE THINKING**

*This proposal form is intended for departments proposing a course for inclusion in the Northern Michigan University General Education Program. Courses in a component satisfy both the Critical Thinking and the component learning outcomes. Departments should complete this form and submit it electronically through the General Education SHARE site.*

**Course Name and Number:** ENV 101 Introduction to Environmental Science

**Home Department**: Earth, Environmental and Geographical Sciences

**Department Chair Name and Contact Information**

Susy Ziegler

3001A New Science Facility

906-227-1104

**Expected frequency of Offering of the course** Fall/Winter

**Official Course Status**: Has this course been approved by CUP and Senate? YES

*Courses that have not yet been approved by CUP must be submitted to CUP prior to review by GEC. Note that GEC is able to review courses that are in the process of approval; however, inclusion in the General Education Program is dependent upon Senate and Academic Affairs approval of the course into the overall curriculum.*

**Overview of course** (please attach a current syllabus as well): *Please limit the overview to two pages (not including the syllabus)*

1. Overview of the course content

This course is designed to help the student begin to understand the foundations of Environmental Science (its basic scientific principals and concepts) and the role that Environmental Science has played, is playing and can play in the future sustainability of our lives on earth. The subject of Environmental Science in this class is constructed around a threefold conceptual paradigm of Natural Sciences, Social Sciences and Geographical Sciences. The class examines global environmental issues (like pollution, biodiversity, sustainable energy, food, environmental health, ecological economics and restoration, and more) as well as the science behind those issues (like earth systems of air, water, plant and animal ecologies, soils, energy, climates, geology and more). The role that human societies (social, cultural, political, religious, demographic, etc.) play in environmental issues and environmental science is also explored. Finally, the importance of geography, of PLACE, is examined as a critical, yet oftentimes overlooked component in the discourse regarding environmental science and environmental issues. There is no doubt that environmental issues have become global issues. But the causes of, impacts of, and resolutions to these global environmental issues are experienced differently at different “locales,” (local places with different scales, different cultures, different biomes, different members of societies, different distributions of costs and benefits, and so on). The operating theme of this Introduction to Environmental Science course is a combination of academic science skill building vis-à-vis’ frameworks of the Scientific Method, and the development of critical thinking skills through environmental readings and analysis of issues. This combination is intended to help build student capabilities for responsible environmental citizenship and decision making.

1. Explain why this course satisfies the Component specified and significantly addresses both learning outcomes

This course satisfies the Integrative Component because environmental science is by its very nature an integrative, interdisciplinary science. This field of study examines environmental issues by incorporating the perspectives, principles and concepts of social sciences, the natural sciences and the geographical sciences. Furthermore, the course pedagogy is founded on the criteria for **critical thinking** and environmental literacy suggested by the National Environmental Education Advancement Project which include:

* *Awareness and appreciation of the natural and built environment*
* *Knowledge of natural systems and ecological concepts*
* *Understanding of current environmental issues*
* *The ability to use* ***critical-thinking and problem-solving skill on environmental issues***

Such an approach is also strongly supported by the National Science Foundation’s Advisory Committee for Environmental Research and Education’s 2009 report when they state, “*We need to increase environmental literacy in the country and around the globe. We must also make our research findings more accessible to policymakers, so they will be able to make the decisions that will improve our ability to live* ***sustainably*** *on Earth*.” And further, “. . . *greater priority must be given to advancing an* ***integrated approach*** *to Earth systems, and addressing the complexity of coupled natural and* ***human systems*** *from* ***local to regional to global scales***.”

1. Describe the target audience (level, student groups, etc.)

ENV 101 is designed to provide an introductory overview of the field of environmental science for freshman in particular, environmental studies/science majors, and non-majors. Its content and topics are of significance to all students as noted by both the National Science Foundations’ Advisory Committee for Environmental Research and Education and National Environmental Education Advancement Project.

1. Give information on other roles this course may serve (e.g. University Requirement, required for a major(s), etc.)

The course currently counts for liberal studies Division III credit and is a core course for three of our four majors.

1. Provide any other information that may be relevant to the review of the course by GEC

I believe this course should be required of all NMU students as is college composition and basic math. As stated by the National Science Foundation’s Advisory Committee for Environmental Research and Education: “*We need to increase environmental literacy in the country and around the globe. We must also make our research findings more accessible to policymakers, so they will be able to make the decisions that will improve our ability to live* ***sustainably*** *on Earth*.” And further, “. . . *greater priority must be given to advancing an* ***integrated approach*** *to Earth systems, and addressing the complexity of coupled natural and* ***human systems*** *from* ***local to regional to global scale”***

**PLAN FOR LEARNING OUTCOMES  
CRITICAL THINKING**

*Attainment of the CRITICAL THINKING Learning Outcome is required for courses in this component. There are several dimensions to this learning outcome. Please complete the following Plan for Assessment with information regarding course assignments (type, frequency, importance) that will be used by the department to assess the attainment of students in each of the dimensions of the learning outcome. Type refers to the types of assignments used for assessment such as written work, presentations, etc. Frequency refers to the number of assignments included such as a single paper or multiple papers. Importance refers to the relative emphasis or weight of the assignment to the entire course. For each dimension, please specify the expected success rate for students completing the course that meet the proficiency level and explain your reasoning. Please refer to the Critical Thinking Rubric for more information on student performance/proficiency in this area. Note that courses are expected to meaningfully address all dimensions of the learning outcome.*

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| **DIMENSION** | **WHAT IS BEING ASSESSED** | **PLAN FOR ASSESSMENT** |
| **Evidence** | Assesses quality of information that may be integrated into an argument | Exams/assignments will evaluate application of environmental science concepts in the analysis of environmental issues, including use of scientific data to support their evaluation of such issues. Assessments will be ongoing and will include a summative evaluation (exam) at the end of the course. It is reasonable to expect a mean of about 78% student proficiency--the rough equivalent of C+ --upon completing the course. |
| **Integrate** | Integrates insight and or reasoning with existing understanding to reach informed conclusions and/or understanding | Students will demonstrate via exams and in-class exercises the integration of fundamental environmental concepts and principles when identifying the origins, consequences and potential resolutions regarding environmental issues. Exams/assignments will evaluate application of environmental science concepts in the analysis of environmental issues, including use of scientific data to support their evaluation of such issues. Assessments will be ongoing and will include a summative evaluation (exam) at the end of the course. It is reasonable to expect a mean of about 78% student proficiency--the rough equivalent of C+ --upon completing the course. |
| **Evaluate** | Evaluates information, ideas, and activities according to established principles and guidelines | Given that core concepts, theories and environmental science methods will be embedded in exams, assignments and classroom discussions, students must demonstrate critical thinking skills (ability to uncover assumptions and reveal faulty reasoning) in the completion of exercises (e.g. composed of open-ended questions, ~~completion of~~ concept maps, deconstruction of arguments, etc.), ~~employing~~ reviewing films and articles, and in answering multiple choice exam/quiz questions. ~~issues.~~ Assessments will be ongoing and will include a summative evaluation (exam) at the end of the course. It is reasonable to expect a mean of about 78% student proficiency--the rough equivalent of C+ --upon completing the course. |

**PLAN FOR LEARNING OUTCOMES  
INTEGRATIVE THINKING**

*Attainment of the INTEGRATIVE THINKING Learning Outcome is required for courses in this component. There are several dimensions to this learning outcome. Please complete the following Plan for Assessment with information regarding course assignments (type, frequency, importance) that will be used by the department to assess the attainment of students in each of the dimensions of the learning outcome. Type refers to the types of assignments used for assessment such as written work, presentations, etc. Frequency refers to the number of assignments included such as a single paper or multiple papers. Importance refers to the relative emphasis or weight of the assignment to the entire course. For each dimension, please specify the expected success rate for students completing the course that meet the proficiency level and explain your reasoning. Please refer to the Rubric for more information on student performance/proficiency in this learning outcome. Note that courses are expected to meaningfully address all dimensions of the learning outcome.*

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| **DIMENSION** | **WHAT IS BEING ASSESSED** | **PLAN FOR ASSESSMENT** |
| **Connections to Experience**  *OR* | Connects academic knowledge to experiences |  |
| **Connections to Discipline** | Makes connections across disciplines | Incorporated into 6 exams students will be required to make connections between various disciplines (e.g. biology or ecology principles/concepts to explain/describe human societal conflicts, resource allocations, cooperative social arrangements, etc.) via the answering of several critical thinking (problem solving) questions. Using 10 in-class one-page written assignments (e.g. critical thinking exercises, film reviews), in-class one-page assignments students will also make connections across disciplines by describing, for example, how ecology concepts have been integrated with economics to create the field of study referred to ecological economics. The connection dimension will be assessed by the student’s selecting or writing the appropriate answer (on the exam or in the exercise). These exercises will have an overall grading weight of 40% and the exams a weight of 60%; it is reasonable to expect a mean of about 75% student proficiency--the rough equivalent of C. |
| **Transfer** | Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations | Using the in-class exercises described, students will employ their understanding of cross-disciplinary concepts to describe ~~demonstrate~~ how an environmental issue in one part of the world (e.g. drought) will require different forms of remediation than in a different part of the world as the result of, say, varying geopolitical patterns or environmental characteristics/limitations. These exercises will have an overall grading weight of 40% and is reasonable to expect a mean of about 75% student proficiency--the rough equivalent of C. |
| **Integrated Communication** | Communicates complex concepts by choosing appropriate content and form | Incorporated into their exams and critical thinking exercises students will demonstrate understating of how the various components of social science (e.g. economics, culture, religion, politics) are interlinked with components of natural science (e.g. climate change, genetics, ecosystems), and how the configuration of those linkages will ultimately be influenced by place(geography). Students will have an opportunity to communicate their understanding of integrated complex concepts via appropriate selection of content/forms (depending on the subject/concept such as: 1) organizing a debate; 2) engaging classmates in role-playing projects; 3) constructing a visual project (e.g. a concept map, collage, artwork, PowerPoint, etc. to the class; 4) writing a positon paper; 5) synthesizing multiple media viewpoints via a visual or written format; 6) video/audio taping of an interview.  The integrated communication portion of exams/exercises will carry an overall grading weight of 40% and average 75% student proficiency for the course.  Overall, the weighting = 40% of the dimensions will be assessed in non-exam portions (critical thinking exercises) of the course, and 60% of the dimensions will be assessed within the 6 formal exams portion. |