



MASTER COURSE OUTLINE

A. BIOL 1010 Principles of Environmental Science

B. COURSE DESCRIPTION:

This course covers general ecological principles related to human impacts on the environment. Environmental problems including population, land use, resources, energy, water pollution, and air pollution will be addressed.

MnTC (Goals 3/NS and 10/PE); (3 Cr – 2 lect, 1 lab)

C. *Core Theme: People and the Environment **Discipline Area (if MnTC): Natural Sciences

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES:

This course addresses the following Riverland Institutional Learning Outcome(s):

- ILO 1: critical thinking (*Core Theme Goal 2*)
- ILO 2: awareness of the larger global community (*Core Theme Goal 7 or 8*)
- ILO 3: ethical, engaged citizenship (*Core Theme Goal 9 or Goal 10*)
- ILO 4: communication and collaboration (*Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration*)

E. MAJOR CONTENT AREAS:

- Science and the scientific method
- Fundamental principles of matter and energy
- Energy flow and biogeochemical cycles
- Fundamentals of species interactions
- Biome types and community succession
- Population ecology
- History/patterns of human population growth
- History/patterns of resource consumption (renewable vs. non-renewable)
- Agricultural practices and environmental issues
- Mechanisms and consequences of anthropogenic climate change
- Value of/threats to biological diversity
- Pollution issues (air, water, land/groundwater)
- Environmental ethics and policy

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

| <u>GOAL TYPE</u> | <u>OBJECTIVES</u> Students will be able to | <u>OUTCOMES</u> The student will successfully |
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| <u>MnTC Goal 3b</u> | formulate and test hypotheses by performing laboratory, simulation or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty. | <ol style="list-style-type: none"> 1. demonstrate an understanding of the scientific method through field and laboratory experiences, as relevant to ecological theories and based on experimental results. 2. explain the limits of science, i.e., experimental error and uncertainty. |
| <u>MnTC Goal 3c</u> | communicate their experimental findings, analyses and interpretations both orally and in writing. | <ol style="list-style-type: none"> 1. discuss, orally and in writing, the validity of results and conclusions regarding the experiences in MnTC Goal 3b. 2. discuss hypotheses, methods, results and conclusion relevant to the above experiences in MnTC Goal 3b. |
| <u>MnTC Goal 3d</u> | evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies. | <ol style="list-style-type: none"> 1. demonstrate an understanding of relevant environmental issues. 2. demonstrate the ability to evaluate competing evidence and viewpoints. 3. make and support judgments on existing environmental policies or the lack of such policies. |
| <u>MnTC Goal 10a</u> | explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems. | <ol style="list-style-type: none"> 1. investigate and explain broad ecological principles, including the structure and function of major ecosystems. 2. investigate and explain the ecological intricacies of today's environmental problems. 3. investigate and explain human impacts and the adaptive strategies of both Western and non-Western societies on ecosystems. |
| <u>MnTC Goal 10d</u> | evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems and institutions. | <ol style="list-style-type: none"> 1. discuss ecological principles. 2. propose and critically evaluate current environmental and natural resource issues. |
| <u>MnTC Goal 10e</u> | propose and assess alternative solutions to environmental problems. | <ol style="list-style-type: none"> 1. propose and critically evaluate solutions to environmental problems. |
| <u>MnTC Goal 10f</u> | articulate and defend the actions they would take on various environmental issues. | <ol style="list-style-type: none"> 1. propose, articulate, and defend proposed actions on various environmental issues. |
| <u>CS</u> | utilize analytical tools (real or simulated) to gather the ecologically relevant data necessary to test hypothesis and come to logical conclusions. | <ol style="list-style-type: none"> 1. demonstrate the use of any combination of real or simulated analytical tools, sensors, etc. in gathering data. 2. draw conclusions based on data analysis, and demonstrated through class or online discussions and/or written laboratory reports. |

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| <u>CS</u> | process and evaluate current environmentally relevant studies, reports, news, seminars etc. from various print, online, or other sources. | 1. demonstrate their understanding of current environmental science issues through any combination of oral/online discussions, written works, or other assessment tools. |
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G. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of course management software. Students who have a disability and need accommodations should contact Accessibility Services at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or current media, upon request.

H. COURSE CODING INFORMATION:

Course Code C, B/Class Maximum 48, 24; Letter Grade

Revision date: 09/28/10; 01/31/18; 09/06/22; 03/05/24

AASC Approval date: 03/06/18; 09/20/22; 03/19/24

*These five MnTC Goals have been identified as Riverland Community College Core Themes. Every course in the Riverland Community College curriculum shall meet outcomes from one of these themes.

**These five MnTC Goals have been identified as Riverland Community College Disciplines. Riverland’s MnTC courses also shall meet outcomes from a Discipline Area.

NOTE: The Minnesota Transfer Curriculum “10 Goal Areas of Emphasis” are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.

| *Riverland Community College Core Themes | MnTC Goal Number |
|---|-------------------------|
| Critical Thinking (CT) | 2 |
| Human Diversity (HD) | 7 |
| Global Perspective (GP) | 8 |
| Ethical and Civic Responsibility (EC) | 9 |
| People and the Environment (PE) | 10 |

| **Riverland Community College Discipline Areas | MnTC Goal Number |
|---|-------------------------|
| Communication (CM) | 1 |
| Natural Sciences (NS) | 3 |
| Mathematics/Logical Reasoning (MA) | 4 |
| History and the Social & Behavioral Sciences (SS) | 5 |
| Humanities and Fine Arts (HU) | 6 |