MASTER COURSE OUTLINE

A. SCIE 1200 Integrated Earth Science and Physics for Elementary Education Majors

B. COURSE DESCRIPTION:

This course is designed as an integrative approach to the exploration of key concepts in earth science and physics including the earth's physical environment, its systems, and the physical processes that drive them. Combining action and analysis, participants will design and conduct experiments in the areas of space science, motion and force, energy, waves, meteorology and climate, earth materials, surface environments, electricity, and sources and production of energy. The instructor and course participants will also facilitate discussions of human/environment interactions such as the impacts of climate change, weather modification, and land-use and land-cover change. Enrollment in this course is limited to elementary education majors only.
MnTC (Goal 3/NS and Goal 10/PE); (4 Cr – 3 lect, 1 lab)

C. *MnTC Discipline: Natural Sciences **Core Theme: People and the Environment

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:
- Introduction to science
- Earth and space
- Motion
- Energy
- Waves
- Meteorology and climate
- Earth materials
- Earth's interior and surface processes
- Electricity
- Sources and production of energy

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

GOAL TYPE	**OBJECTIVES** **Students will be able to**	**OUTCOMES** **The student will successfully**
MnTC Goal 3a	demonstrate understanding of scientific theories.	1. describe the evolution of historical perspectives in the key theories of earth and space science. 2. explain the fundamental principles of climate change science.
MnTC Goal 3b	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.	1. recognize sources of bias and uncertainty in experimental design. 2. analyze data derived from experiments and communicate results orally and in written format.
MnTC Goal 3d	evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.	1. formulate questions and make judgments on science-related policies adopted by the government. 2. discuss the potential risks and rewards of allowing people to alter weather and land-use.
MnTC Goal 10a	explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.	1. identify the characteristics of various ecosystems around the world. 2. explain how humans have adapted to these ecosystems.
MnTC Goal 10d	evaluate critically environmental and natural resource issued in light of understandings about interrelationships, ecosystems, and institutions.	1. explain how different geologic processes have resulted in the world distribution of various geologic resources. 2. demonstrate an understanding of how the extraction of these resource materials can affect the environment and ecology of the location.
MnTC Goal 10e	propose and assess alternative solutions to environmental problems.	1. explain the causes of various environmental problems such as acid rain, asbestos-related problems, problems caused by the burning of fossil fuels, etc. 2. identify alternate ways in which the problems above could be avoided.
MnTC Goal 10f	Articulate and defend the actions they would take on various environmental issues.	1. discuss various ways of approaching different environmental problems. 2. defend the strategies in solving various environmental issues.
CS	identify the materials that make up earth and outline tectonic plate processes.	1. discuss the nature of soil, to include structure, minerals, and the soil-water balance.

		2. classify igneous, metamorphic, and sedimentary rocks; discuss how they change over a geologic time scale. 3. explain plate tectonics and its impact on the lithosphere.
CS	recognize the role running water, waves, wind, and ice play in landform development.	1. explain how fluvial landscapes are formed and how running water changes them over time. 2. describe the impact of waves on coastlines and discuss the influence of tides on wave action. 3. provide examples of wind action on the earth, to include types of dunes, wind storms, and erosion by wind. 4. discuss glacier formation and recent decline in the number and size of glaciers.
CS	discuss Newton's laws of motion.	1. define force and mass. 2. distinguish between mass and weight. 3. classify forces including normal force, frictional force, and elastic force. 4. define key physics quantities in circular motion.

F. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of a course management software program. 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.

G. COURSE CODING INFORMATION: Course Code B/Class Maximum 24; Letter Grade

Revision date: 08/22/16; 09/01/22
AASC Approval date: 10/18/16; 09/20/22

***Riverland Community College Disciplines**	**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**

**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**

*These five MnTC Goals have been identified as Riverland Community College Disciplines.
** These five MnTC Goals have been identified as Riverland Community College Core Themes.
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.