

WINONA STATE UNIVERSITY
GENERAL EDUCATION PROGRAM APPROVAL FORM

Routing form for General Education Program Course approval.

Course GEOS 104 Catastrophes and Extinctions

Department Approval

[Signature]
Department Chair

1/23/14
Date

tdogwiler
e-mail address

Dean's Recommendation ☒ Yes ☐ No*

Charla Smutsch 1/28/14
Dean of College Date

*If the dean does not approve the proposal, a written rationale should be provided to the General Education Program Subcommittee.

GEPS Recommendation ☐ Approved ☐ Disapproved

Chair, General Education Program Subcommittee Date

A2C2 Recommendation ☐ Approved ☐ Disapproved

Chair of A2C2 Date

Faculty Senate Recommendation ☐ Approved ☐ Disapproved

President of Faculty Senate Date

Academic Vice President Recommendation ☐ Approved ☐ Disapproved

Academic Vice President Date

Decision of President ☐ Approved ☐ Disapproved

President Date

Please forward to Registrar.

Registrar _____
Date entered

Please notify department chair via e-mail that curricular change has been recorded.

[Revised 10-22-12]

5/2/14

WINONA STATE UNIVERSITY
PROPOSAL FOR GENERAL EDUCATION PROGRAM COURSES

Department Geoscience

Date 1/22/2014

104

Course No.

Catastrophes and Extinctions

Course Name

3

Credits

Prerequisites none

GEP Goal Area(s):*

CORE GOAL AREAS

- ☐ Goal 1: Communication
☒ Goal 3: Natural Science
☐ Goal 4: Mathematics/Logical Reasoning
☐ Goal 5: History and the Social and Behavioral Sciences
☐ Goal 6: The Humanities and Fine Arts

THEME GOAL AREAS

- ☐ Goal 7: Human Diversity
☐ Goal 8: Global Perspective
☐ Goal 9: Ethical and Civic Responsibility
☐ Goal 10: People and the Environment

Note: this course is already listed under Goal Area 3, but we are requesting renewal of this goal area at this time so that in the future GEOS 104 and GEOS 114 (Catastrophes and Extinctions with Lab) will come up for renewal at the same time.

* Courses may be submitted for up to two Goal Areas.

Additional Requirement Categories (list number of credits desired in appropriate category):

☐ Intensive:

- ☐ 1. Writing
☐ 2. Oral Communication
☐ 3a. Mathematics/Statistics
☐ 3b. Critical Analysis

☐ Physical Development and Wellness

Provide information as specified in the previous directions.

Attach a **General Education Program Approval Form**.

Department Contact Person for this Proposal:

W. Lee Beatty

Name (please print)

x2241

Phone

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e-mail address

[Revised 9-6-11]

Application for GEOS 104 Catastrophes and Extinctions with Lab to satisfy Goal Area 3 Natural Sciences (Note: this course is already listed under Goal Area 3, but we are requesting renewal of this goal area at this time so that in the future GEOS 104 and GEOS 114 (Catastrophes and Extinctions with Lab) will come up for renewal at the same time).

Outline:

1. Rocks and the rock cycle
 - a. Sedimentary rocks
 - b. Igneous rocks
 - c. Metamorphic rocks
 - d. The rock cycle
2. Geologic Time
 - a. Relative dating
 - b. Radiometric dating
 - c. The geologic timescale
3. Formation/early history of the Earth
 - a. Formation of the Solar System
 - b. Formation of the Earth
 - c. Iron catastrophe
 - d. Formation of the Moon
 - e. Heavy bombardment
4. Plate tectonics
 - a. Layers of the Earth
 - b. Convergent boundaries
 - c. Divergent boundaries
 - d. Transform boundaries
 - e. Hot spot volcanism
 - f. What moves the plates?
5. The atmosphere
 - a. Composition
 - b. Climate controls
 - c. Albedo
 - d. Greenhouse effect
 - e. Feedbacks
 - f. The carbon cycle
6. Early life
 - a. Tree of life
 - b. Prokaryotes
 - c. Eukaryotes
 - d. Extremophiles
 - e. Stromatolites
 - f. Photosynthesis
7. Rise of oxygen
 - a. Causes & evidence
 - b. Banded iron formations
 - c. Paleosols
 - d. Redbeds
 - e. Oxygen holocaust
8. Glaciers & Snowball Earth
 - a. Properties and processes of modern glaciers
 - b. Milankovitch cycles
 - c. Evidence for global glaciations
 - d. End-proterozoic snowball Earth
 - e. Emerging from snowball Earth
 - f. Effects on biodiversity
9. Fossils and the fossil record
 - a. What is a fossil?
 - b. Methods of preservation
10. Evolution and Extinction
 - a. What is evolution?
 - b. Genetic mutation
 - c. Natural selection
 - d. What is extinction?
 - e. Background extinction
 - f. Mass extinction
 - g. The fossil record of extinction
11. The Paleozoic
 - a. Cambrian explosion
 - b. Ordovician extinction
 - c. Devonian extinction
 - d. Permian extinction
12. The Mesozoic
 - a. Triassic extinction
 - b. Cretaceous extinction
13. The Cenozoic
 - a. Megafauna extinction
 - b. Toba catastrophe
 - c. European-influenced extinction
 - d. Present-day extinctions

Student Competencies for GEP Goal 3	Learning Opportunity	Assessment Method
Demonstrate understanding of scientific theories	Students will have multiple opportunities to investigate scientific theories and processes pertinent to the study of geoscience, global catastrophes and mass extinctions.	In in-class assignments , students will investigate (over multiple weeks) how one of the fundamental theories of the geosciences, plate tectonics, was one of the mechanisms that led to several mass extinctions during Earth's history. Students will demonstrate their knowledge of these theories on quizzes and exams .
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	Students will have a variety of opportunities to collect and analyze their own data, analyze existing data sets, and graph and interpret data in order to answer questions pertinent to the study of geology, global catastrophes and mass extinctions.	In classroom discussions, quizzes and exams students will be asked to interpret graphical presentations of data in order to answer questions.
Communicate their experimental findings, analyses, and interpretations both orally and in writing.		
Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies	Students will have multiple opportunities to explore the ways our society interacts with the Earth system, and to evaluate implications of these interactions.	In in-class assignments, quizzes and exams students will be asked to evaluate humanity's impact on the Earth system, particularly the climate system and the biosphere. They will also evaluate human-induced extinctions, both historical and modern, and how (or if) humans can prevent another mass extinction event.