WINONA STATE UNIVERSITY
NEW AND REVISED COURSE AND PROGRAM APPROVAL FORM

Routing form for new and revised courses and programs.

Course or Program_**GEOS 114** _

Department Recommendation

[signature] 1/14/14 tdogwiler@winona.edu

Department Chair Date e-mail address

Dean's Recommendation X Yes ____ No*

Charles S Mutschler 1/10/14

Dean of College Date

*The dean shall forward their recommendation to the chair of the department, the chair of A2C2, and the Vice President for Academic Affairs.

A2C2 Recommendation ____ Approved ____ Disapproved

Chair of A2C2 Date

Graduate Council Recommendation ____ Approved ____ Disapproved
(if applicable)

Chair of Graduate Council Date

Director of Graduate Studies 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 ____ Please notify department chair via e-mail that curricular change has been recorded.
Date entered

WINONA STATE UNIVERSITY
PROPOSAL FOR A NEW COURSE

This form is to be used to submit a proposal for a new undergraduate or graduate course. Every item on this form must be completed prior to submission to A2C2. The department proposing a new course must include a ***Financial and Staffing Data Sheet*** and a ***New and Revised Course and Program Approval Form*** with the department chairperson's and Dean's signatures. Refer to Regulation 3-4, ***Policy for Changing the Curriculum***, for complete information on submitting proposals for curricular changes.

Department ___**Geoscience**_____ Date _____**1/8/2014**_____

___**GEOS 114**_____	____**Catastrophes and Extinctions with Laboratory**_____	__**4**____
Course No.	Course Title	Credits*

This proposal is for a(n): __**X**____ Undergraduate Course _____ Graduate Course

Is this course for USP? ____Yes** __**X**__ No Is this course for GEP? __**X**__Yes** ____ No

List all Major Codes to which this proposal applies as a required course:
None
List all Major Codes to which this proposal applies as an elective course:
GSCE Geoscience: Geoscience option (B.A. degree)
GEGE Geoscience: Geology option (B.S. degree)
GEES Geoscience: Environmental Science option
List all Minor Codes to which this proposal applies as a required course:
None
List all Minor Codes to which this proposal applies as an elective course:
GEOS Geoscience

Prerequisites **None**_____

Grading method __**X**___ Grade only _____ P/NC only _____ Grade and P/NC Option

Frequency of offering __**Yearly**_____

What semester do you anticipate that will this course be offered for the first time? __**Fall 2014**_____
Note: The approval process for a new course typically takes at least four to six weeks

* If this course will change the number of credits for any major or minor, the form ***Proposal for a Revised Program*** must also be submitted and approved according to the instructions on that form.

For General Education Program (GEP) or University Studies (USP) course approval, the form ***Proposal for General Education Courses* or ***Proposal for University Studies Courses*** must also be completed and submitted according to the instructions on that form.

Please provide all of the following information:
(Note: a syllabus or other documentation may not substitute for this)

A. Course Description

1. **Description of the course as it will appear in the WSU catalog, including the credit hours, any prerequisites, and the grading method. If the course can be repeated, indicate the maximum number of credit hours for which this can be done.**

114 – Catastrophes and Extinctions with Laboratory (4 S.H.)
More than 99% of species that have lived on Earth are now extinct. This course examines the history of the Earth and life through the lens of catastrophism – the idea that sudden, worldwide, often violent events have played a major role in the evolution of the Earth and the organisms that inhabit it. It stresses the idea that Earth is an interconnected system and that the parts of the system (lithosphere, hydrosphere, atmosphere and biosphere) interact with and affect each other. The course covers topics such as deep time, the formation of the solar system and Earth, Earth processes such as plate tectonics and climate change, fossils and evolution, mass extinctions and their possible causes, and humanity's role in extinction events. Meets GOAL 3. Grade only. Offered yearly. **Note**: Students may enroll in either GEOS 114 or GEOS 104 – Catastrophes and Extinctions, but they cannot earn credit for both courses.

2. Course outline of the major topics, themes, subtopics, etc., to be covered in the course. This outline should be, at a minimum, a two-level outline, i.e., consisting of topics and subtopics. This information will be submitted to MnSCU by the WSU Registrar's office.

Outline for lecture portion of the course:

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 extinction

List of associated laboratory exercises:

1. Minerals
2. Rocks
3. Geologic Time
4. Fossils
5. Impact Effects and Records of Impacts
6. Climate Change
7. Population Ecology and Evolution
8. Volcanoes and Climate
9. Maps/Topographic Maps/Google Earth
10. Plate Tectonics
11. Permian/Triassic Extinction
12. Cretaceous/Paleogene Extinction
13. Modern Extinction

3.a Instructional delivery methods utilized: (Please check all that apply).

Auditorium/Classroom:**X**	ITV	Online	Web Enhanced	Web Supplemented
Laboratory: X	Service Learning	Travel Study	Internship/Practicum	
Other: (Please indicate)				

3.b. MnSCU Course media codes: (Please check all that apply).

None: X	3. Internet	6. Independent Study	9. Web Enhanced
1. Satellite	4. ITV Sending	7. Taped	10. Web Supplemented
2. CD Rom	5. Broadcast TV	8. ITV Receiving	

4. Course requirements (papers, lab work, projects, etc.) and means of evaluation.

Grades will be calculated in the following way:

Class Exam Score	28%
Final Exam Score	17.5%
Class Quiz Score	14%
Class Assignment Score	10.5%
Lab Score	30%

General grade breakdown:

A = 90 – 100
B = 80 – 89
C = 70 – 79
D = 60 – 69
F = < 60

5. Course materials (textbook(s), articles, etc.).

Babcock, L. 2008. Visualizing Earth History, Wiley, 480 pp.

Students will also use other readings from popular science magazines, videos and online materials as provided by the instructor.

Laboratory materials will be provided by the instructor.

6. List the student learning outcomes for this course and how each outcome will be assessed.

- Students will recognize that Earth is an interconnected system and that the parts of the system (lithosphere, hydrosphere, atmosphere and biosphere) interact with and effect each other
  - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will summarize plate tectonic theory, explain how tectonic plates move and interact
  - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will evaluate how events that occurred during the early history of the Solar System led to the Earth & Moon as they are today
  - Assessed by: quizzes, exams, laboratory exercises
- Students will understand geologic time & the geologic timescale
  - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will investigate the evolution of Earth's atmosphere and the role of life in that evolution
  - Assessed by: quizzes, exams, laboratory exercises
- Students will analyze how the Earth's climate changes and how climate has changed radically throughout Earth's history
  - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will explain evolution and its relationship to extinction, background extinction and mass extinction
  - Assessed by: quizzes, exams, laboratory exercises
- Students will discuss the underlying causes of the major extinction events that have occurred during Earth's history
  - Assessed by: quizzes, in-class exercises, exams
- Students will understand fossils, how fossils are formed, and biases in the fossil record, and how the fossil record is interpreted to construct the history of life on Earth
  - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will evaluate the role of humans in extinction events
  - Assessed by: quizzes, in-class exercises, exams
- Students will learn to read and collect data from traditional topographic maps and digital elevation models.
  - Assessed by: laboratory exercises

B. Rationale
Provide a rationale for the new course. The rationale should include the following items.

1. A statement of the major focus of the course.

This course examines the history of the Earth and life through the lens of catastrophism – the idea that sudden, worldwide, often violent events have played a major role in the evolution of the Earth and the organisms that inhabit it. It stresses the idea that Earth is an interconnected system and that the parts of the system (lithosphere, hydrosphere, atmosphere and biosphere) interact with and affect each other. The course covers topics such as deep time, the formation of the solar system and Earth, Earth processes such as plate tectonics and climate change, fossils and evolution, mass extinctions and their possible causes, and humanity's role in extinction events.

2. A statement of how this course will contribute to the departmental curriculum.

This course will provide a laboratory option for the GEOS 104 Catastrophes and Extinctions course. Similar to our GEOS 120 Dynamic Earth with Laboratory and GEOS 121 Dynamic Earth options, GEOS 104 and GEOS 114 will be taught during the same lecture period, but the GEOS 114 students will take the required laboratory section. Pending approval, GEOS 114 would fulfil Goal 3 for non-majors under the GEP.

Pending approval of this course, the Geoscience Department will put forth the appropriate paperwork for this course to be an option for the entrance to the major for the GEES, GEGE and GEOS degree options.

3. A statement of why this course is to be offered at this level (i.e. 100-, 200-, 300-, 400-, or 500-level)

This course is a general education course and is intended for students from all majors/backgrounds.

4. Identification of any courses which may be dropped, if any, if this course is implemented.

No course will be dropped from the Geoscience curriculum, but this course may be used to replace some sections of GEOS 120 Dynamic Earth with lab based on demand and instructor preference.

C. Impact of This Course on Other Departments, Programs, Majors, and Minors
Provide a statement of the impact of this course on other departments, programs, majors, and minors.

1. Clearly state the impact of this course on courses taught in other departments. Does this course duplicate the content of any other course? Is there any effect on prerequisites for this or any other courses?

No impact on courses taught in other departments is anticipated. This course does not duplicate the content of courses taught in other departments. There is no anticipated effect on prerequisites.

2. Would approval of this course change the total number of credits required by any major or minor of any department? If so, explain the effects which this course would have.

Approval of GEOS 114 would not change the number of credits required for any major or minor in other departments.

3. If this course has an impact on the major or minor of any other department or program, it is the responsibility of the department submitting the course proposal to send written notification to the department(s) or program(s) affected. State clearly which other programs are affected by this proposal and whether the other departments have been notified and/or consulted. Attach letter(s) of understanding from impacted department(s).

N/A

D. Attach to This Proposal a Completed
1. ***Financial and Staffing Data Sheet***
2. ***New and Revised Course and Program Approval Form***

E. Department Contact Person for this Proposal:

_W. Lee Beatty _____	___x2241_____	_wbeatty@winona.edu_____
Name (please print)	Phone	e-mail address

F. Review by Department A2C2 Representative

I have reviewed this proposal and certify that it is complete _____
Signature of A2C2 representative

Definitions for codes in 3a and 3b:

01-Satellite:

02- CD ROM:

03- Internet: Predominately = where all, or nearly all, course activity occurs in an online environment. One to two activities may occur face-to-face in a classroom, with the maximum being two activities.

04 – ITV Sending: a course in which students are in the classroom with the instructor, other students join via interactive television technology from other geographically separate locations

05 – Broadcast TV:

06 – Independent Study: a course in which the teacher develops specialized curriculum for the student(s) based on department guidelines in the University course catalog

07 – Taped: a course in which the teacher records the lessons for playback at a later date

08 – ITV Receiving: a course in which students are not in the classroom with the teacher, other students join via interactive television technology from other geographically separate locations

09 – Web Enhanced- Limited Seat Time: For a course in which students are geographically separate from the teacher and other students for a majority of required activities. However, some on-site attendance is required. The course includes synchronous and/or asynchronous instruction.

10 – Web Supplemented- No Reduced Seat Time: For a course utilizing the web for instructional activities. Use of this code may assist your college/university in tracking courses for “smart classrooms” and/or facility usage.

WINONA STATE UNIVERSITY
FINANCIAL AND STAFFING DATA SHEET

Course or Program___**GEOS 114** __

Include a Financial and Staffing Data Sheet with any proposal for a new course, new program, or revised program.

Please answer the following questions completely. Provide supporting data.

1. Would this course or program be taught with existing staff or with new or additional staff? If this course would be taught by adjunct faculty, include a rationale.

   This course will be taught with existing staff.

2. What impact would approval of this course/program have on current course offerings? Please discuss number of sections of current offerings, dropping of courses, etc.

   This course will provide a laboratory option for GEOS 104 Catastrophes and Extinctions. Similar to our GEOS 120 Dynamic Earth with lab and GEOS 121 Dynamic Earth options, GEOS 104 and GEOS 114 will be taught during the same lecture period, but the GEOS 114 students will take the required laboratory section. This course would replace some sections of GEOS 120/121 depending on demand and faculty preference.

3. What effect would approval of this course/program have on the department supplies? Include data to support expenditures for staffing, equipment, supplies, instructional resources, etc.

   Departmental supplies and resources will not be impacted. The laboratory can be taught with supplies/resources currently on hand.