


WINONA STATE UNIVERSITY
NEW AND REVISED COURSE AND PROGRAM APPROVAL FORM

Routing form for new and revised courses and programs.

Course or Program GEOS 113 Natural Disasters with Laboratory

Department Recommendation		
<u></u> Department Chair	<u>1/14/14</u> Date	<u>tdogwiler@winona.edu</u> e-mail address
Dean's Recommendation <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*		
<u>Charles Smith</u> Dean of College	<u>1/16/14</u> 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 <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
 Chair of A2C2	 Date	
Graduate Council Recommendation <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved (if applicable)		
 Chair of Graduate Council	 Date	
 Director of Graduate Studies	 Date	
Faculty Senate Recommendation <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
 President of Faculty Senate	 Date	
Academic Vice President Recommendation <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
 Academic Vice President	 Date	
Decision of President <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
 President	 Date	
Please forward to Registrar.		
Registrar <u> </u> Date entered	Please notify department chair via e-mail that curricular change has been recorded.	

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 113
Course No.

Natural Disasters with Laboratory
Course Title

4
Credits*

This proposal is for a(n): ☒ Undergraduate Course ☐ Graduate Course

Is this course for USP? ☐ Yes** ☒ No Is this course for GEP? ☒ 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)

GECE 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 ☒ 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.**

113 - Natural Disasters with Laboratory (4 S.H.)

An investigative exploration of significant geohazards impacting the Earth with emphasis on volcanoes, earthquakes, landslides and other hill slope failures, hurricanes, tornadoes and floods. Geologic processes governing each type of disaster are explored.

Prediction, impacts and mitigation potential for each hazard are examined. Climate change, human influence on the impacts of a changing climate on weather-related disasters will be discussed. Meets GOAL 3 and 10. Grade only. Offered yearly. **Note:** Students may enroll in either GEOS 113 or GEOS 103 – Natural Disasters, 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. Introduction
 - a. Difference between natural hazard and natural disaster
 - b. Effects of hazards
 - c. Disasters in developed and developing countries
 - d. Mitigation of natural disasters
2. 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?
3. Earthquakes
 - a. Stress & strain
 - b. Faults
 - c. Seismic waves
 - d. Earthquake intensity
 - e. Effects of earthquakes
 - f. Intraplate earthquakes
 - g. Predicting earthquakes
 - i. Early warning systems
 - ii. Reducing earthquake risks
4. Volcanoes
 - a. Products of volcanic eruptions
 - b. Volcanic hazards
 - c. Eruptive styles and associated landforms
 - d. Caldera formation & eruptions
 - e. Monitoring & forecasting
5. Stream processes
 - a. Erosion
 - b. Transport
 - c. Deposition
 - d. Types of streams
6. Floods
 - a. Hydrographs
 - b. Flood frequency curves & recurrence intervals
 - c. Flood styles
 - d. Controlling flood hazards
7. Weather
 - a. Atmosphere
 - b. Weather processes
 - c. Hazards related to weather
8. Thunderstorms & tornadoes
 - a. Storm development
 - b. Hazards associated with storms
 - c. Origins of tornadoes
 - d. Mitigation
9. Climate change
 - a. Climate vs. weather
 - b. Albedo
 - c. Greenhouse effect
 - d. Feedbacks
 - e. Carbon cycle
 - f. Climate change trends & impacts
 - g. Mitigating climate change
10. Hurricanes
 - a. How do hurricanes develop?
 - b. Hurricane movement
 - c. Hurricane damage

- d. Prediction, warning and planning
- e. Can we reduce the energy of a hurricane?

List of associated laboratory exercises (some topics will cover multiple weeks):

1. Population Growth; Review of unit conversions and basic math
2. Minerals and Rocks important to geologic hazards
3. Introduction to Google Earth
4. Plate Tectonics and geologic hazards
5. Topographic maps
6. Earthquakes
7. Volcanoes
8. Rivers and flooding
9. Landslide hazards
10. Global climate change
11. Tsunami

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

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 Exams (3)	30%
Final Exam	15%
Quizzes	15%
In-class Assignments and Discussions	10%

This will consist of small group exercises and whole class discussions focusing on a topic recently discussed in lecture (e.g. flood frequency, evaluating potential threat of volcanic hazards, etc.)

Laboratory Assignments and Exams	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.).

Hyndman, D. and Hyndman, D., 2014, Natural Hazards and Disasters, 4th ed. Brooks/Cole: Belmont. ISBN: 978-1-133-59081-1

Best, D.M. and Caputo, M.V., 2011, Geologic Disasters Laboratory, Kendall Hunt Publishing Company: Dubuque.
ISBN: 978-0-7474-9087-0

Students will also use other materials and the internet as instructed by the professor.

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 affect each other
 - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will summarize plate tectonic theory, explain how tectonic plates move and interact and how these processes lead to natural hazards
 - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will summarize how weather-related hazards occur
 - Assessed by: quizzes, exams, laboratory exercises
- Students will evaluate how human decisions affect the severity of natural disasters
 - Assessed by: in-class exercises, exams, laboratory exercises
- Students will identify areas at risk for specific natural disasters (local & regional, global)
 - Assessed by: quizzes, exams, laboratory exercises
- Students will identify populations at risk for various natural disasters
 - Assessed by: in-class exercises, exams, laboratory exercises
- Students will evaluate ways of mitigating various natural hazards
 - Assessed by: in-class exercises, exams, laboratory exercises
- Students will explain why certain areas are vulnerable to natural disasters
 - Assessed by: in-class exercises, exams, laboratory exercises
- Students will understand how scientists study climate change.
 - Assessed by: quizzes and exams
- Students will outline current and future trends and impacts of global climate change, including how a changing climate will affect weather-related disasters.
 - Assessed by: quizzes, in-class exercises, exams, laboratory exercises
- Students will collect and interpret data to evaluate earthquake probability, determine flood frequency, create flood hazard maps, etc.
 - Assessed by: in-class exercises, exams, laboratory exercises
- 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 is an investigative exploration of significant geologic and weather-related hazards impacting the Earth, with a specific focus on volcanoes, earthquakes, landslides and other hill slope failures, hurricanes, tornadoes and floods. Students will investigate (over multiple weeks) how one of the fundamental theories of the geosciences, plate tectonics, is the foundation of processes responsible for creating several of the major natural hazards discussed in class. Prediction, impacts and mitigation potential for each hazard will be examined. Climate change, human influence on the climate and how a changing climate will impact weather-related disasters will also be covered.

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

This course will provide a laboratory option for our popular GEOS 103 Natural Disasters course. Similar to our GEOS 120 Dynamic Earth with Laboratory and GEOS 121 Dynamic Earth options, GEOS 103 and GEOS 113 will be taught during the same lecture period, but the GEOS 113 students will take the required laboratory section. Pending approval, GEOS 113 would fulfil Goal 3 and Goal 10 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, GECE 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 113 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:

Name (please print)

____x5789_____
Phone

____ckairiesbeatty@winona.edu_____
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 113 Natural Disasters with Laboratory

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 our popular GEOS 103 Natural Disasters course. Similar to our GEOS 120 Dynamic Earth with lab and GEOS 121 Dynamic Earth options, GEOS 103 and GEOS 113 will be taught during the same lecture period, but the GEOS 113 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.