FAIRMONT STATE UNIVERSITY

MEMORANDUM

FINAL FACULTY SENATE APPROVAL ON 12/9/2014

TO: Faculty Senate

FROM: Jack Kirby

DATE: October 28, 2014

SUBJECT: Curriculum Proposal #14-15-07, REV #1

Creation of Science Course

I recommend approval of the attached REVISION #1 Curriculum Proposal 14-15-07. This proposal allows for the permanent creation of a Science Course, "Science of Disasters", which has been offered for three consecutive semesters. The course has fulfilled an elective for non-science majors and has been submitted for acceptance as a general studies approved course. This proposal requests approval of the course for the 2015-16 catalog and to be assigned a formal SCIE number.

c: Dr. Christina Lavorata
Dr. Donald Trisel
Dr. Debra Hemler
Ms. Leslie Lovett
Ms. Evie Brantmayer
Ms. Cheri Varkonda

CURRICULUM PROPOSAL (Submit one hard copy and an electronic copy to the Associate Provost by the second Tuesday of the month.)

Proposal Number:	14-15-07
School/Department/Program:	Science & Technology/Biology, Chemistry & Geoscience
Preparer/Contact Person:	Dr. Deb Hemler
Telephone Extension:	4393
Date Originally Submitted:	9/24/15
Revision (Indicate date and label it Revision #1, #2, etc.):	10/28/14 Revision #1
Implementation Date Requested:	Spring 2015

I. **PROPOSAL**. Write a brief abstract, not exceeding 100 words, which describes the overall content of the proposal.

The "Science of Disasters" has been successfully offered as an SCIE 1199 course for three semesters as a science elective for non-science majors. This proposal requests that it be approved for the FSU 2015-16 catalog and assigned a formal SCIE number. (In addition, has been submitted for acceptance as a general studies approved course.)

II. **DESCRIPTION OF THE PROPOSAL**. Provide a response for each letter, A-H, and for each Roman Numeral II–V. If any section does not apply to your proposal, reply N/A.

A. Deletion of course(s) or credit(s) from program(s)

Total hours deleted. **n/a**

B. Addition of course(s) or credit(s) from program(s)

Total hours added. **n/a**

C. Provision for interchangeable use of course(s) with program(s) **n/a**

D. Revision of course content. Include, as an appendix, a revised course description, written in complete sentences, suitable for use in the university catalog.

n/a

E. Other changes to existing courses such as changes to title, course number, and elective or required status.

n/a

F. Creation of new course(s). For each new course

1. Designate the course number, title, units of credit, prerequisites (if any), ownership (FSU or shared) and specify its status as an elective or required course. If you are creating a shared course, attach a memo from the Deans of the affected Schools explaining the rationale for the course being shared.

   SCIE 1130 The Science of Disasters (4 Credits)
   No prerequisites
   FSU owned course
   Elective Course (also submitted for approval to general studies)

2. Include, as an appendix, a course description, written in complete sentences, suitable for use in the college catalog.

   See Appendix B

3. Include, as an appendix, a detailed course outline consisting of at least two levels.

   See Appendix C

4. In order to meet the requirements as outlined in Goal One of the Strategic Plan, please include Outcome Competencies and Methods of Assessment as an appendix. Examples are available upon request from the Chair of the Curriculum Committee.

   See Appendix D

G. Attach an itemized summary of the present program(s) affected, if any, and of the proposed change(s).

Describe how this proposal affects the hours needed to complete this program. Specifically, what is the net gain or loss in hours? Use the format for Current and Proposed Programs in Appendix A.

n/a

III. **RATIONALE FOR THE PROPOSAL.**

A. **Quantitative Assessment**: Indicate the types of assessment data, i.e., surveys, interviews, capstone courses, projects, licensure exams, nationally-normed tests, locally developed measurements, accreditation reports, etc., that were collected and analyzed to determine that curricular changes were warranted. Quantitative data is preferred.

The Disasters course has been offered three times as an SCIE 1199 course. In those three offerings it has been a popular course, filling every time the course has been offered. As seen below there is some attrition from registration to completion, however most students complete the course. Overall students are successful in the course and fewer "Fs" have occurred as the instructor has modified and improved the course.

Table: Student performance during the last three offerings.

Year	#Students	A's	B's	C's	D's	F's
2011	22	7	3	5	1	6
2012	23	3	7	6	2	5
2013	23	3	9	8	2	1
Total	68	13	19	19	5	12

B. **Qualitative Assessment**: Based upon the assessment data above, indicate why a curricular change is justified. Indicate the expected results of the change. Be sure to include an estimate of the increased cost, or reduction in cost of implementation. FOR EXAMPLE: Will new faculty, facilities, equipment, or library materials be required?

Science and Technology regularly offers three face to face SCIE courses (Human Biology, Science that Matters, and Earth & Sky) which have been approved and meet general studies outcomes. This course would be offered every fall and would provide more diversity to the non-science major. No new faculty is needed for this course since the course has been offered by the same instructor for three semesters in the past three years.

IV. Should this proposal affect any course or program in another school, a memo must be sent to the Dean of each school impacted and a copy of the memo(s) must be included with this proposal. In addition, the Deans of the affected schools must sign below to indicate their notification of this proposal.

By signing here, you are indicating your college's/school's notification of this proposal.

College/School	Dean	Signature
Science and Technology	**Dr. Don Trisel**	

V. Should this proposal affect any course to be added or deleted from the general studies requirements, a memo from the chair of the General Studies Committee indicating approval of the change must be included with this proposal.

This course has been submitted to general studies for approval. See Appendix E for the proposal submission.

VI. ADDITIONAL COMMENTS.

APPENDIX A

B.X. Degree in XXXXXXXX

Current Program

Required Major Courses	HRS
Not applicable	
TOTAL Required Major Courses	XX
Major Electives	XX
Minor Requirements/Electives (if minor is required)	XX
TOTAL HOURS FOR MAJOR (and minor if required)	**XX**

Required General Studies Courses (example text highlighted)	
Attribute IA – Critical Analysis	X
Attribute IB – Quantitative Literacy	3
Attribute IC – Written Communication	3
Attribute ID - Teamwork	X
Attribute IE – Information Literacy	3
Attribute IF – Technology Literacy	3
Attribute IG – Oral Communication	3
Attribute III - Citizenship	3
Attribute IV - Ethics	3

Attribute V - Health	3
Attribute VI - Interdisciplinary	3
Attribute VIIA - Arts	3
Attribute VIIB - Humanities	3
Attribute VIIC – Social Sciences	X
Attribute VIID - Natural Science	3
Attribute VIII – Cultural Awareness	3
Additional General Studies hours	X
TOTAL GENERAL STUDIES HOURS	**39**
TOTAL FREE ELECTIVES	**XX**
TOTAL HOURS	**120**

Appendix B: Course Description

COURSE DESCRIPTION – SCIE 1130: THE SCIENCE OF DISASTERS

This course is designed to engage students interested in the science behind geological and many human-made disasters. The course introduces geology with special emphasis on geological processes such as plate tectonics, movement of fluids such as wind, water, and ice, and gravity-driven movements of materials. It presents the principles underlying catastrophic events that have occurred throughout Earth's history and then illustrates these principles with examples taken from geologic history, written historical accounts, and today's headlines. The course assesses some of society's attempts to engineer solutions to geological problems, global and extraterrestrial forces as they affect the planet, and our current understanding of the cause and effect of climate change. This course is conducted primarily in lecture and discussion format with the inclusion of in-class exercises and relevant case studies presented in web format.

Appendix C: Two level course outline

Course Outline – Science of Disasters

I. Introduction
   A. Connection to "standard" Introductory Geology classes
   B. The Scientific Method

II. Plate Tectonics & Earthquakes
   A. Earth – heat flow, gravity, and Earth's interior
   B. Nature of Earth's crust and interactions between plates
   C. Causes of earthquakes
   D. Detecting, describing, and predicting seismic events
   E. Historical and modern earthquakes

III. Tsunamis
   A. Causes of tsunamis
   B. Detection and warnings
   C. Historical and modern tsunamis

IV. Volcanoes
   A. Volcanoes relation to the tectonic plates
   B. Types of volcanoes, eruptive behavior, and products
   C. Historical and modern tsunamis

V. Streams
   A. Fluid flow and sediment transport
   B. Erosion and deposition of sediment
   C. Stream systems and associated land surface features

VI. Flooding
   A. Causes and effects of flooding
   B. Predicting and mitigation floods and flood damage
   C. Historical and modern floods

VII. Waves and Coastal Processes
   A. Wave dynamics
   B. Coastal erosion and mitigation of damage
   C. Examples of modern coastal erosion

VIII. Snow, Ice, and Glaciers
   A. Snow, ice physics, and gravity
   B. Transport, erosion, and deposition by moving ice
   C. Modern examples of effects of moving snow and ice

IX. Soil, Drought, & Deserts
   A. Soil/sediment forming processes and soil zonation
   B. Aeolian transport, erosion, and deposition of sediment
   C. Formation of deserts and desert landforms
   D. Modern dust/sand storms and examples of active desertification

X. Mass Movements of Materials
   A. Gravity and stability and failure of earth materials
   B. Types of mass movements of earth materials
   C. Prediction and mitigation of mass movements
   D. Modern examples of mass movements

XI. Extraterrestrial events
   A. Extraterrestrial materials, sources, description, and movement
   B. Consequences of impacts, detection, and prediction
   C. Historical and modern examples of impacts

XII. Human-made Hazards
   A. Engineering approach to modifying Earth's surface
   B. Design engineered structures, design flaws, and synergistic effects
   C. Modern examples of human-made hazards

XIII. Climate Change
   A. Geological evidence of Earth's past climate
   B. Modeling and prediction of climate change
   C. Historical and modern examples of the effects of changing climate

Appendix D: Outcomes and Course Objectives

Course Outcomes and Assessment (see General Studies document for more details on assessment)

Students will:

1. proficiently use geologic vocabulary, concepts, theories, and laws as they relate to disasters.
   Assessment: exam VII.D.1
2. correctly identify limits and processes of science (scientific inquiry) in remediating and presenting disasters.
   Assessment: paper VII.D.2
3. use process skills of scientific inquiry: collection, modeling, analysis, and interpretation of quantitative and qualitative data. *Assessment: activity scores* VII.D.3
4. use scientific inquiry and process skills to remediate or prevent a geologic or human-made disaster.
   Assessment: Disasters final project score VII.D.4

Course Objectives Correlated to General Studies Outcomes

Student will proficiently describe:

1. basic geological processes driven by thermodynamics, gravity, and Earth's orbital motion. VII.D.1
2. causes of earthquakes, tsunamis, and volcanoes and their effects on humans. VII.D.1
3. the causes of flooding, stream and coastal erosion and their effects on humans. VII.D.1
4. the causes of soil erosion, desertification, and glaciations and their effects on humans. VII.D.1
5. mass movements of soil, rock, and ice and their effect on humans. VII.D.1
6. extraterrestrial forces and how they have shaped Earth's history. VII.D.1
7. familiarity with past disasters of a catastrophic nature recorded in written and geologic history and the ability to explain them in terms of scientific principles. VII.D.1
8. how humans have attempted to modify the environment to suit human purposes and how these attempts have produced "side-effects." VII.D.2

Students will demonstrate the ability to:

9. assess the current state of knowledge of the causes of climate change and possible future effects on humans. VII.D.3
10. make recommendations solutions for remediating disasters. VII.D.4

11. examine the evidence pertaining to geological case study, to evaluate the evidence, to draw conclusions regarding the evidence, and to defend those conclusions to other investigators. VII.D.4