08-71.

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		07-431	App-1/29/09	App-2/24/09

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person	Email Address
Jonathan Lewis	**jclewis@iup.edu**
Proposing Department/Unit	Phone
Geoscience	**7-5624**

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)

X New Course ____Course Prefix Change ____Course Deletion

____Course Revision ____Course Number and/or Title Change ____Catalog Description Change

	GEOS 203 Surficial Processes
***Current* Course prefix, number and full title**	***Proposed* course prefix, number and full title, if changing**

2. Additional Course Designations: check if appropriate

X This course is also proposed as a Liberal Studies Course.

____ This course is also proposed as an Honors College Course.

____ Other: (e.g., Women's Studies, Pan-African)

3. Program Proposals

____Catalog Description Change ____Program Revision

____New Degree Program ____Program Title Change ____Other

____New Minor Program ____New Track

***Current* program name**	***Proposed* program name, if changing**

4. Approvals		**Date**
Department Curriculum Committee Chair(s)		2/4/08
Department Chair(s)		2/4/08
College Curriculum Committee Chair		2-11-08
College Dean	Gary Stewart	2-11-08
Director of Liberal Studies *	Mary E Sole	3-27-08
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)	Joseph Domaracki TECC	1.26.09
	Mary Ann Rafoth Dean COE-ET	1-26.09
UWUCC Co-Chairs	Received SEP 25 2008	Received FEB 14 2008
	Gail Sechrist	1-29-09

* where applicable

Liberal Studies Liberal Studies

LIBERAL STUDIES COURSE APPROVAL, PARTS I-III: GENERAL INFORMATION CHECK-LIST

I. Please indicate the LS category(ies) for which you are applying:

LEARNING SKILLS:

_____ First Composition Course _____ Second Composition Course
_____ Mathematics

KNOWLEDGE AREAS:

_____ Humanities: History
_____ Humanities: Philos/Rel Studies
_____ Humanities: Literature
__X__ Natural Sci: Laboratory
_____ Natural Sci: Non-laboratory
_____ Fine Arts
_____ Social Sciences
_____ Non-Western Cultures
_____ Health & Wellness
_____ Liberal Studies Elective

II. Please use check marks to indicate which LS goals are primary, secondary, incidental, or not applicable. When you meet with the LSC to discuss the course, you may be asked to explain how these will be achieved.

Prim	Sec	Incid	N/A		
				A.	**Intellectual Skills and Modes of Thinking:**
X				1.	Inquiry, abstract logical thinking, critical analysis, synthesis, decision making, and other aspects of the critical process.
	X			2.	Literacy--writing, reading, speaking, listening.
	X			3.	Understanding numerical data.
		X		4.	Historical consciousness.
X				5.	Scientific Inquiry.
	X			6.	Values (Ethical mode of thinking or application of ethical perception).
			X	7.	Aesthetic mode of thinking.
X				**B.**	**Acquiring a Body of Knowledge or Understanding Essential to an Educated Person**
			X	**C.**	**Understanding the Physical Nature of Human Beings**
				D.	**Collateral Skills:**
		X		1.	Use of the library.
	X			2.	Use of computing technology.

III. The LS criteria indicate six ways that courses should contribute to students' abilities. Please check all that apply. When you meet with the LSC, you may be asked to explain your check marks.

__X__ 1. Confront the major ethical issues that pertain to the subject matter; realize that although "suspended judgment" is a necessity of intellectual inquiry, one cannot live forever in suspension; and make ethical choices and take responsibility for them.

__X__ 2. Define and analyze problems, frame questions, evaluate available solutions and make choices.

__X__ 3. Communicate knowledge and exchange ideas by various forms of expression, in most cases writing and speaking.

__X__ 4. Recognize creativity and engage in creative thinking.

__X__ 5. Continue learning even after the completion of their formal education.

__X__ 6. Recognize relationships between what is being studied and current issues, thoughts, institutions, and/or events.

Liberal Studies Course Approval Part IV

A. This course will be taught in one section by one instructor.

B. Readings taken from New York Times reporter Elizabeth Kolbert's book "Field Notes from a Catastrophe: Man, Nature, and Climate Change" will highlight the important contributions that this female journalist has made to conveying modern science to a broad audience (see "C" below).

C. In addition to the textbook *Earth: Portrait of a Planet* by Stephen Marshak, a number of non-textbook readings will incorporated into the course. Numerous peer-reviewed scientific articles will be read in order to help students to develop their scientific reading skills as well as specific content. In addition non-textbook readings will come from popular literature that addresses relevant scientific material. These will include readings from the following sources:

Articles

Ashworth, Philip J., James L. Best and Merren Jones (2004), Relationship between sediment supply and avulsion frequency in braided rivers, Geology, v. 32, no. 1, pp. 21-24.

Gustavson, Thomas C. and Dale A. Winkler (1988), Depositional facies of the Miocene-Pliocene Ogallala Formation, northwestern Texas and eastern New Mexico, Geology, v. 16, no. 3, pp. 203-206.

Leier, Andrew L., Peter G. DeCelles and Jon D. Pelletier (2005), Mountains, monsoons, and megafans, Geology, v. 33, no. 4, pp. 289-292.

Sageman, Bradley B., Michael H. Gardner, John M. Armentrout and Adam E. Murphy (1998), Stratigraphic hierarchy of organic carbon–rich siltstones in deep-water facies, Brushy Canyon Formation (Guadalupian), Delaware Basin, West Texas, Geology, vol. 26, no. 5, pp. 451–454.

Books

Kolbert, Elizabeth. *Field Notes from a Catastrophe: Man, Nature, and Climate Change.* New York: Bloomsbury Publishing, 2006.

McPhee, John. *The Control of Nature.* New York: Farrar, Straus and Giroux, 1990.

D. This course will draw on elements of the geosciences pertinent to understanding the interactions between the lithosphere, biosphere, hydrosphere and atmosphere. As such, the course will focus on the processes that bear on the parts of Earth that constitute the human ecosystem. The content will follow logically from that covered in GEOS 201 Foundations in Geology. The emphasis on processes and the resulting rock products is designed to provide a working knowledge of the Earth Sciences that will be readily transferable to a variety of academic as well as career paths, including but not limited to: agriculture, economics, anthropology, geography, safety science and history.

CHECK LIST -- NATURAL SCIENCES (Laboratory)

Knowledge Area Criteria which the course must meet:

_X___ Treat concepts, themes and events in sufficient depth to enable students to appreciate the complexity, history and current implications of what is being studied; and not be merely cursory coverage of lists of topics.

_X___ Suggest the major intellectual questions/problems which interest practitioners of a discipline and explore critically the important theories and principles presented by the discipline.

_X___ Allow students to understand and apply the methods of inquiry and vocabulary commonly used in the discipline.

_X___ Encourage students to use and enhance, wherever possible, the composition and mathematics skills built in the Skill Areas of Liberal Studies.

Natural Science Criteria which the course must meet:

_X___ Examine a body of knowledge of natural science that will contribute to an understanding of the natural world.

_X___ Provide an understanding of the development of natural science theories and their modification.

_X___ Teach students to formulate and test hypotheses.

_X___ Provide an understanding of some of the "great moments" in the history of natural science and the individuals, including women and minorities, responsible for them.

Natural Science Laboratory Criteria which the course must meet:

_X___ Provide students with opportunities to learn and apply data-gathering techniques.

_X___ Provide students with opportunities to develop skills in making accurate observations, in formulating concise and appropriate descriptions of natural phenomena, and in producing meaningful systems of classification for natural objects.

_X___ Provide students with opportunities to apply theories to practice in the working world of science.

Additional Natural Science Criteria which the course should meet:

_X___ Encourage an appreciation of the complex interrelationship of natural science with the life of the individual.

_X___ Develop in students the abilities necessary to cope with the consequences of natural science in the modern world.

_X___ Develop an inquiring attitude consistent with the tenets of natural sciences, an attitude that is willing to expose fallacy on the basis of reason, that demands evidence for scientific assertions, and yet is tolerant of hypotheses in the absence of contradictory evidence.

PART II: Description of Curricular Change

1. Syllabus of Record

I. Catalog Description:

3 class hours
3 lab hours
4 credit hours
(3c-3l-4cr)

GEOS 203 Surficial Processes
Prerequisite: Grade of C or better in GEOS 201
Introduces students to the geological processes which shape the Earth's surface, from uplift and erosion of mountains to the transport of sediment and subsequent formation of sedimentary rocks. Focuses on the interaction of underlying tectonic forces with the natural cycles of the Earth's atmosphere and hydrosphere and the subsequent evolution of both landscape and surface deposits.

II. Course Objectives
At the end of this course students will be able to:

1) Combine knowledge of surface processes such as uplift, erosion, subsidence and sedimentation into an understanding of how the Earth's surface is formed and shaped through time.
2) Demonstrate understanding of the fate of sediments, from their creation by weathering through their transport by fluvial, eolian, glacial, gravitational and tectonic processes.
3) Compare and contrast the impact of different environmental factors on the composition and distribution of soils, sediments and sedimentary rocks.
4) Summarize and discuss the ways in which plate tectonic forces drive surficial processes, and how changes on the Earth's surface can in turn affect the course of plate tectonics.
5) Recognize the impact of cycles in the Earth's orbit, atmosphere, hydrosphere and climate on the nature and outcome of surface processes.

Student outcomes assessment matrix:

Conceptual Framework (Danielson Domain)	Content Standard (NSTA Science Teacher Preparation)	Course Objective	Assessment (*denotes assessment for reporting)
1	1a	1	Final Exam
1	1a	2	*Lab Quiz 2
1	1a	3	*Lab Project
1	1a, 1b	4	Exam 2
1	1b	5	Final Exam

III. Course Outline
See table below.

GEOS 203-A01 Surficial Processes Lecture		
Meeting	**Content**	**Theme**
1	Isostasy, introduction to geophysics	Controls on Earth's surface (3 academic hours)
2	Tectonic uplift	
3	Subsidence & basin formation	
4	Introduction to climates	Making sediments (3 academic hours)
5	Weathering - mechanical & chemical	
6	Mechanisms of erosion	
7	Transport & depositional processes - intermontane/alluvial	Terrestrial depositional systems (6 academic hours)
8	Transport & depositional environments - intermontane/alluvial	
9	Rock products - intermontane/alluvial	
10	Transport & depositional processes - fluvial/deltaic	
11	Transport & depositional environments - fluvial/deltaic	
12	Rock products - fluvial/deltaic	
13	**Exam One (1 hr)**	
14	Transport & depositional processes - carbonate banks/reefs	Marine depositional systems (5 academic hours)
15	Rock products - carbonate banks/reefs	
16	Transport & depositional processes - transitional/deep water	
17	Transport & depositional environments - transitional/deep water	
18	Rock products - transitional/deep water	
19	Sedimentary facies	Deposition through time (3 academic hours)
20	Transgression	
21	Regression	
22	Earth as a system	Earth system science (3 academic hours)
23	Lithosphere-Atmosphere coupling	
24	Lithosphere-Hydrosphere coupling	
25	Fluvial processes	Stream systems (3 academic hours)
26	Fluvial landforms	
27	Quantitative fluvial geomorphology	
28	**Exam Two (1 hr)**	
29	Ground-water flow & occurrence	Hydrosphere (5 academic hours)
30	Ground-water controlled landscapes	
31	Introduction to oceanography - global circulation patterns	
32	Introduction to oceanography – ocean chemistry	
33	Sea level change	
34	Ice ages	Global change (3 academic hours)
35	Global cycles	
36	Climate change	
37	Compaction & cementation of clastic sediments	Sedimentary rock evolution (3 academic hours)
38	Chemical sediment formation	
39	Chemical sediment diagenesis	
40	Organic chemical sediments	Energy resources (3 academic hours)
41	Fossil fuels	
42	Renewable energy resources	
FINALS	**Cumulative Lecture Final During Finals Week**	

GEOS 203-A02 Surficial Processes Laboratory		
Lab	**Content**	**Theme**
1	Describing sediments & rocks	Basic skills development (6 academic hours)
2	Map skills	
3	Quiz 1, Intermontane/alluvial system analysis	Integrative analyses of multicomponent systems (12 academic hours)
4	Fluvial/deltaic system analysis	
5	Quiz 2, Carbonate bank/reef system analysis	
6	Transitional/deep water system analysis	
7	Quiz 3, Weekend Fieldtrip	Applications of lecture & lab concepts to actual field sites (9 academic hours)
8	Student presentations of depositional system projects	
9	Fluvial systems fieldtrip - Aultman bony pile/Young Twp Park	
10	Ground water	Hydrosphere (6 academic hours)
11	Quiz 4, Oceanography	
12	Climate change & glacial processes/deposits	Earth Systems & Resources (6 academic hours)
13	Chemical sediments, diagenesis & fossil fuels	
14	Final Exam During Final Lab Period	

IV. Evaluation Methods
The final class grade will be determined from the following assessments:

Exam 1	125 points
Exam 2	125 points
Final Exam	200 points
Lab Quizzes (4)	60 points total
Lab Final Exam	50 points
Lab Project	40 points
Total	600 points

Possible points earned are distributed between lecture and lab according to the credit hour allocation for the course (3 credits for the lecture, 1 credit for the lab). Total class points will be calculated by adding together the scores of the three lecture exams, four lab quizzes, lab project and lab final and dividing by 600 to obtain the class average for the semester.

V. Example Grading Scale
The final grade will be assigned based on the semester average using the scale: 90-100%=A; 80-89%=B; 70-79%=C; 60-69%=D and below 60%=F.

VI. Attendance Policy
The attendance policy will conform to IUP's undergraduate course attendance policy.

VII. Required Textbook(s), Supplemental Books and Readings.
The required textbook for this course:
Marshak, Steven. *Earth: Portrait of a Planet.* New York: W.H. Norton and Co., 2005.

This text will be supplemented by assigned electronic reserve readings from specialized textbooks and research articles from the primary geologic literature.

VIII. Special Resource Requirements.
There are no special resource requirements for this course.

IX. Bibliography.
Published Resources
M.R. Bennett and N.F. Glasser, 1996. *Glacial Geology: Ice Sheets and Landforms*. Wiley, London.
D. W. Burbank, A. E. Blythe, J. Putkonen, B. Pratt-Sitaula, E. Gabet, M. Oskin, A. Barros and T. P. Ojha, Decoupling of erosion and precipitation in the Himalayas, Nature 426, 652-655 (11 December 2003) doi: 10.1038/nature02187.
J. Esper, E.R. Cook and F.H. Schweingruber, Low-frequency signals in long tree-line chronologies for reconstructing past temperature variability, *Science*, 295, 2250-2253, 2002.
D. Knighton, 1998. Fluvial Forms and Processes, Arnold, N.Y., 383 p.
S. Lamb and P. Davis, Cenozoic climate change as a possible cause for the rise of the Andes, Nature 425, 792-797 (23 October 2003) doi: 10.1038/nature02049.
M.E. Mann, R.S. Bradley, and M.K. Hughes, Northern Hemisphere Temperatures During the Past Millennium: Inferences, Uncertainties, and Limitations, *Geophysical Research Letters*, *26*, 759-762, 1999.
M.E. Mann, P.D. Jones, Global surface temperature over the past two millennia, *Geophysical Research Letters*, 30 (15), 1820, doi: 10.1029/2003GL017814, 2003.
R. L. Orndorff, 2002, Introducing Problem Formulation And Spatial Analysis With An Example In Global Warming And Sea Level Rise: Journal of Geoscience Education, v. 50, p. 357.
K. Richards, 2004. Rivers Form and Process in Alluvial Channels. The Blackburn Press NJ, 361 p.
Simon J. Dadson, Niels Hovius, Hongey Chen, W. Brian Dade, Meng-Long Hsieh, Sean D. Willett, Jyr-Ching Hu, Ming-Jame Horng, Meng-Chiang Chen, Colin P. Stark, Dimitri Lague and Jiun-Chuan Lin, Links between erosion, runoff variability and seismicity in the Taiwan orogen, Nature 426, 648-651 (11 December 2003) doi: 10.1038/nature02150
J.M. Trop, G.H. Krockover & K.D. Ridgway, K.D., 2000, Integration of Field Observations with Laboratory Modeling for Understanding Hydrologic Processes in an Undergraduate Earth-Science Course. Journ. Geoscience Ed. v. 48, p. 520.
Online Resources
Crabaugh, Jeff. 2005. Teaching Geoscience with Visualizations: Sedimentation Models http://serc.carleton.edu/NAGTWorkshops/visualization/collections/sedmod.html
R. Stewart. 2006, Our Ocean Planet: Oceanography in the 21st Century (online textbook): http://oceanworld.tamu.edu/resources/oceanography-book/contents2.htm
USC Stratigraphy Web Site (with animations) http://strata.geol.sc.edu/

Course Analysis Questionnaire

Section A: Details of the Course
A1. How does this course fit into the programs of the department? For which students is the course designed? Explain why this content cannot be incorporated into an existing course.
This course is designed as a core class for B.S. Geology/Geology Track and B.S. Geology/Environmental Track majors, and as a controlled elective for Earth and Space Science Education majors and Geology minors. The content cannot be incorporated into an existing course as it extracts introductory elements from a number of sub-disciplines within the Geosciences. Development of this introductory course reflects shifting emphases in the broader field of the geosciences.

A2. Does this course require changes in the content of existing courses or requirements for a program?
No. This course will serve as one of our new introductory courses designed to introduce majors and minors to wide range of upper-level geoscience courses.

A3. Has this course ever been offered at IUP on a trial basis?
This course has not been previously offered at IUP in any form.

A4. Is this course to be a dual-level course?
This course is not a dual-level course.

A5. If this course may be taken for variable credit, what criteria will be used to relate the credits to the learning experience of each student?
This course cannot be taken for variable credit.

A6. Do other higher education institutions currently offer this course? If so, please list examples.
Yes.
California State University Sacramento, GEOL 120 – Surficial Processes
University of Michigan, GEOSCI 442 – Earth Surface Processes and Soils
University of Calgary, GEOL 373 – Surficial Geology
Whittier College, Earth Sciences 310 – Surficial Processes and Landforms
University of Maine at Farmington, GEY 210 – Surficial Processes
University of Toledo, Earth, Ecological and Environmental Sciences 3100 – Surficial Processes

A7. Is the content, or are the skills, of the proposed course recommended or required by a professional society, accrediting authority, law or other external agency?
No.

Section B: Interdisciplinary Implications
B1. Will this course be taught by instructors from more than one department.
No.

B2. What is the relationship between the content of this course and the content of courses offered by other departments?
There is a small amount of potential content shared between the proposed course and GEOG 342 (Physiography) in as much as both classes address landforms and the erosional processes that shape them. The underlying difference in how this common content is explored is that, in the proposed class, emphasis will be placed on how these features are ultimately preserved in the geologic record. The Department of Geography and Regional Planning has been informed of this potential overlap; at the time of submission, the Geoscience Department has received no official response (see "Letters of Support or Acknowledgement" section in the main body of the Program Revisions Proposal).

B3. Will this course be cross-listed with other departments?
No.

B4. Will seats in this course be made available to students in the School of Continuing Education?
No.

Section C: Implementation

C1. Are faculty resources adequate?

Faculty resources are currently adequate to teach this course. This course will be counted as one preparation and six hours of equated workload.

C2. What other resources will be needed to teach this course and how adequate are the current resources?

The resources previously used for Physical Geology and Historical Geology lectures and labs will utilized in the teaching of this class so no new resources will be required.

C3. Are any of the resources for this course funded by a grant?

No.

C4. How frequently do you expect this course to be offered?

Once per academic year. There are no seasonal restrictions

C5. How many sections of this course do you anticipate offering in any single semester?

One.

C6. How many students do you plan to accommodate in a section of this course? What is the justification for this planned number of students?

The lecture and laboratory for this course will be integrated and our laboratory facilities accommodate 24 students, therefore, 24 will be the maximum number of students per section.

C7. Does any professional society recommend enrollment limits or parameters for a course of this nature?

No.

C8. Not applicable.

Section D: Miscellaneous

None

Part III. Letters of Support or Acknowledgment

See "Letters of Support or Acknowledgement" section in the main body of the Program Revisions Proposal.