22A
88-89

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

LSC Use Only	
Number	LS-8
Action	
Date	

UWUCC Use Only	
Number	[illegible]
Action	
Date	

I. TITLE/AUTHOR OF CHANGE
COURSE/PROGRAM TITLE PHYSICAL GEOLOGY & HISTORICAL GEOLOGY
DEPARTMENT GEOSCIENCE
CONTACT PERSON K.R. Cercone

II. THIS COURSE IS BEING PROPOSED FOR:
____ Course Approval Only
_X_ Course REVISION and Liberal Studies Approval
____ Liberal Studies Approval only (course previously has been approved by the University Senate)

III. APPROVALS

Connie J. Sutton
Department Curriculum Committee

[signature]
Department Chairperson

[signature]
College Curriculum Committee

[signature]
College Dean*

Director of Liberal Studies
(where applicable)

Provost
(where applicable)

*College Dean must consult with Provost before approving curriculum changes. Approval by College Dean indicates that the proposed change is consistent with long range planning documents, that all requests for resources made as part of the proposal can be met, and that the proposal has the support of the university administration.

IV. TIMETABLE

Date ~~Submitted~~
to LSC _____
to UWUCC _____

~~Semester/Year to be implemented~~ Fall 1989

~~Date to be published~~ in Catalog _____

Revised 5/88

[Attach remaining parts of proposal to this form.]

APPLICATION FOR LIBERAL STUDIES APPROVAL FOR 1989-90

DEPARTMENT: GEOSCIENCE
COURSES: GS 121/122/123 PHYSICAL GEOLOGY
GS 131/132/133 HISTORICAL GEOLOGY
LIBERAL STUDIES CATEGORY: NATURAL SCIENCE
TWO SEMESTER LAB OPTION

FACULTY COORDINATORS: CONNIE J. SUTTON, CHAIRPERSON
KAREN ROSE CERCONE, DARLENE S. RICHARDSON, FRANK W. HALL,
JOHN F. TAYLOR, FREDERICK R. PARK

INTRODUCTION

The Geoscience Department has been informed by Dr. Cashdollar that IUP's new Liberal Studies guidelines are not intended to discourage students from satisfying their requirements with rigorous introductory courses if they so desire. On that basis, the department would like to offer GS 121/122/123 (Physical Geology) and GS 131/132/133 (Historical Geology) as Liberal Studies courses which can be used to fulfill the two-laboratory natural science requirement. We would like the Liberal Studies committee to be aware that the Geoscience Department is also proposing the course sequence GS 101/102 and 103/104 (Earth Science) as a Liberal Studies course specifically designed to introduce concepts of geology, oceanography, meteorology and astronomy to the non-science major.

The sequence of Physical Geology and Historical Geology will offer a thorough and wide-ranging introduction to the science of geology, covering all aspects of the earth's formation, evolution and dynamic behavior. The course sequence is intended as a liberal studies option particularly for students majoring in geology-related fields such as biology and environmental health, chemistry, physics, geography and safety science. All liberal studies students will take a two-hour lab option (GS 121 and 131). Geology and Geoscience majors will share the same lecture sections (GS 121 and 131) but will be required to take a three-hour lab option for professional training (GS 123 and 133).

For Curriculum Committee information, please note that this proposal involves a name change from General Geology I and II to Physical Geology and Historical Geology. This change is intended to reflect the emphasis on concepts and overview in the lecture section, while professional training for majors is restricted to the new lab sections: Intensive Physical Geology Lab (GS 123) and Intensive Historical Geology Lab (GS 133).

I. BASIC INFORMATION

A. Knowlege Area: Natural Sciences: Laboratory Course
B. Regular approval
C. Substitution for General Education GS 121/122 and 131/132

II. GOALS

A.) Intellectual skills - primary

1.) Inquiry & critical anlysis: test questions and term projects will be used to stimulate critical analysis of geological problems such as relative age dating.

2.) Understanding numerical data: lab exercises will involve manipulation of numerical data such as topographic elevations, longitude and latitude, etc.

3.) Scientific inquiry: all aspects of this course will emphasize application of the scientific method, in readings, term projects and lab assignments.

B.) Acquiring a body of knowlege - primary

A thorough understanding of the way in which the earth works and its historical evolution will be emphasized in all lectures and many labs. This will involve acquisition by the student of the fundamental facts of earth behavior and the events of the geologic record.

III. FULFILLMENT OF GENERAL CRITERIA

A.) The lecture portion of the proposed course sequences (GS 121, Physical Geology, and GS 131, Historical Geology) will be taught in two sections, each consisting of a mixture of majors and non-majors. Each section will use a similar text and cover similar material (see attached syllabi). The difficulty of assignments and exams will be kept consistent by frequent instructor consultation (including test comparison). The two-hour lab portions of these sequences (GS 121, Physical Geology Laboratory and GS 131, Historical Geology Laboratory) will be taught in several sections using the same lab manual and the same syllabus. Laboratory exams will also be compared for equivalence between sections. The three-hour lab portion of these sequences (GS 123, Intensive Physical Geology Laboratory and GS 133, Intensive Historical Geology Laboratory) will be taught as a single section in which Geology/Geoscience majors receive more detailed, pre-professional training in geologic laboratory techniques. They will use a different lab manual from students in GS 122/132.

B.) Both Physical and Historical Geology will highlight and discuss many contributions by women and minorities. Examples include Tanya Atwater's contributions to plate tectonic theory; Jennifer Kitchell's new theories of punctuated evolution; Ken

Hsu's theories of sea-level rise and fall in the Miocene Mediterranean and Luis and Walter Alvarez' provocative theories of asteroid impact in connection with the Cretaceous extinction of the dinosaurs. In addition, tests will be constructed and reading materials will be assigned with sensitivity to both gender and ethnic identity. For instance, the lab manual will identify "the geologist" in word problems as "she" 50% of the time.

C.) The sciences are faced with special difficulties in meeting the Liberal Studies criterion of non-text, book-length reading assignments. In cases where appropriate, up-to-date books exist (for example, John McPhee's In Suspect Terrain, Basin and Range and Rising from the Plains, Walter Sullivan's Landprints and Continents in Motion, Bob Bakker's The Dinosaur Heresies or David Raup's The Nemesis Affair) such readings will be assigned. Where no appropriate modern monographs exist, substitute readings will be assigned from professional journals such as Science, Nature and Geology.

D.) As stated in our introduction, the Geoscience Department will offer a course sequence (Earth Science) specifically designed to provide non-science majors with an appropriate overview of our field. However, the lecture portions of both Physical and Historical Geology will provide an equally wide-ranging overview, due to the nature of the material being covered. Because our content fields include the earth's dynamic processes (in Physical Geology) and its evolution through time (in Historical Geology), the scope of this course sequence necessarily embraces concepts of wide interest to all concerned citizens. Examples include the relationships between plate tectonics and natural disasters such as volcanic eruptions and earthquakes; the interactions among the earth's atmosphere, hydrosphere and biosphere discussed both during examination of the earth's early history and its more recent responses to pollution (the greenhouse effect); and the cycles of evolution and extinction seen in the fossil record and their relationships to climate and extraterrestrial forces.

The actual training that our Geology and Geoscience majors receive in the working techniques of geology occurs not in lecture but in laboratory. For this reason, we have designed two laboratory options: an intensive three-hour lab which all majors will be required to take and a two-hour lab option for the Liberal Studies students in the course. The three-hour lab will focus on the use of geologic techniques such as mineral and rock identification, map reading, cross-section drawing and field collection of data. This intensive course will prepare students for future geology coursework. The two-hour lab option will cover some of the same material, but will always place it in a context of conceptual discovery. Geologic techniques will not be learned for their own sake but for what they teach students about the nature of geologic reasoning, the limitations of the scientific method in geology and the applications of geologic

knowlege to problems likely to be encountered by non-geologists in the real world. In this way, the course sequence becomes appropriate as a Liberal Studies elective for the Natural Science requirement.

E.) The Physical and Historical Geology course sequences will contribute to students' abilities in the following ways:

1.) Confronting major ethical issues: in studying the way that the earth works as a system, it is necessary to examine those cases in which the system has become perturbed by human activity. Such ethical issues as the disposal of waste in geologic environments, the utilization of the earth's limited natural resources and the construction of cities in tectonically active regions are all discussed in detail in these courses.

2.) Defining and analyzing problems: in the two-hour laboratory option, students will be required to collect geologic data and to apply techniques of information-gathering to typical problems that might be encountered in the real world: putting a house site in a flood-plain, for example: or drilling a water well into a structurally complex sequence of rocks. These types of lab exercises are designed to focus on problem-solving skills.

5.) Continue learning: one comment which we receive again and again from former General Education students who have passed through our department is how much they appreciate their geologic coursework when they travel through other parts of the country. (Our departmental collection of post-cards testifies to this!) Both Physical and Historical Geology focus on the earth's landscape, in terms of dynamic processes such as river flow, landslides and beach erosion and also in terms of historical evolution, such as the rock record of ancient climates, ancient mountain chains and ancient forms of life. The concepts taught in both of these courses allow students to continue observing the earth with an informed eye and enable them as voters to make important decisions on environmental issues.

6.) Recognize relationships between the course and current events: the nature of the earth as an ever-changing body demands that we use current events within our teaching, in order to present our course content in an up-to-date manner. Examples of current geologic events discussed in Physical and Historical Geology include volcanic eruption (Surtsey; Mount St. Helens); earthquakes (Mexico City); storms and climate changes (Hurricane Gilbert; the 1988 drought); natural disasters (Yellowstone forest fires; rockslides on Rt. 28 near Pittsburgh every spring); and disposal of waste in geologic environments (Atlantic beach pollution by hospital wastes). All news stories which involve the earth are likely to be used as illustrations of geologic processes within this course sequence: our field of

study here IS the real world. In addition, knowlege of present geological events (for example widespread forest fires in North America in 1988 or in Australia in 1981-82) serve as a key to help us evaluate past geologic events (for example, the continent-wide fires that may have occurred 65 million years ago).

IV. Fulfillment of natural science criteria

A.) Physical Geology:

The lecture portion of this class discusses the dynamic processes which shape the earth, with emphasis placed on the complex relationships between atmosphere, hydrosphere, biosphere and lithosphere. Processes such as lithospheric plate motions, rock formation and landscape evolution are covered in depth in order to allow students to grasp the fundamental concepts of earth behavior. Major intellectual questions are clearly presented in areas where geologic knowlege is still evolving, for example in the mechanics of earthquakes and the causes of glaciation. In these cases, theories of plate tectonics and climatic variation are examined in detail. Great moments in the science (ie, Norman Bowen's discovery of the mineral reaction series in crystallizing magma; Fred Vine's discovery of the significance of magnetic anomalies on the sea-floor; Ken Hsu's discovery of shallow-water salt in the Mediterranean) are presented and students are asked to formulate their own hypotheses for these data sets in order to recreate the way in which major theories were originally proposed.

The two-hour laboratory portion of the class emphasizes gathering geologic data, such as mineral and rock type, land elevation and subsurface rock distribution in order to solve geologic problems. Exercises include: determining the environment of rock formation from mineral content; proposing hypothetical construction sites from topographic maps; predicting areas prone to floods from river studies; predicting the degree of hazard in areas prone to earthquakes.

In comparison, the three-hour laboratory portion of the class not proposed for Liberal Studies approval will focus simply on developing the students' ability to identify all geologically-significant rocks and minerals in the field and to analyze map data as a preparation for future geology coursework.

B.) Historical geology:

The lecture portion of this class treats the evolution of the earth's atmosphere, hydrosphere, biosphere and lithosphere through time, from the planet's formation to the recent ice ages. Processes such as mountain-building and natural selection are covered in depth to allow students to grasp the fundamental concepts of earth history. Major intellectual questions are clearly presented in areas where geologic knowlege is still evolving, for example the early history of the planet, or the

detailed record of evolution. In these cases, theories of plate tectonics and natural selection are examined in detail. Great moments in the science (ie, James Hutton's discovery of unconformities at Siccar Point; Charles Darwin's discovery of natural selection in the Galapagos Islands; Tanya Atwater's discovery of spreading ridge subduction under California) are presented and students are asked to formulate their own theories for these data sets in order to recreate the way in which major theories were originally proposed.

The two-hour laboratory portion of this course emphasizes gathering geological data such as fossil identification and sedimentary and tectonic rock structures to solve geologic problems. Exercises include: determining the relative ages of rocks using fossil content; reconstructing geologic history of an area from its stratigraphic record; and documenting landscape evolution from geologic structure.

The three-hour laboratory portion of this course [redacted] will concentrate on developing the students' abilities to recognize all geologically-significant fossils and structures as a preparation for upper-level coursework.

V.) Course syllabi: see attachments

VI.) Curriculum committee course proposal forms: see attachments

Physical Geology
Lecture Syllabus

Section 01A
Dr. J.F. Taylor
102 Walsh Hall

Office Hours
M 10:15-11:45/1:00-2:00
T 10:45-11:45
W 10:15-11:45
(or by Appointment)

Text: Earth, 4th Edition, Press & Siever

Sequence of Lecture Topics

Date	Lec. #	Topic	Text Chapter
Sept. 7	1.	Basic Chemistry/Minerals defined	3
9	2.	Silicate Mineral Class	3
12	3.	Other (Non-silicate) Mineral Classes	3
14	4.	Igneous Rock Classification/Plutonism	3,15
16	5.	Plutonism & Plutons (Intrusives)	15
19	6.	Volcanism & Extrusives	16
21	7.	FILM	
23	8.	Volcanism (continued)	16
26	9.	Mechanical Weathering	5
28	10.	Chemical Weathering	5
30	11.	EXAM #1 (Chapter 1 required reading)	
Oct. 3	12.	Products of Weathering/Detrital Sedimentary rocks	12
5	13.	Chemical and Biochemical Sedimentary rocks	12
7	14.	Metamorphism and Metamorphic rocks	17
10	15.	Metamorphic Rocks/Rock Cycle	17
12	16.	Geologic Time and the Rock Record	2
14	17.	Structural Geology	4
17	18.	Structural Geology	4
19	19.	Mass Movement	6
21	20.	Hydrologic Cycle: Fluvial Erosion	8
24	21.	Fluvial Erosion and Sediment Transport	8
26	22.	Fluvial Deposition/FILM: Rivers: the Work of Running Water	8
28	23.	EXAM #2 (Chapter 7 required reading)	
31	24.	Groundwater	7
Nov. 2	25.	Groundwater	7
4	26.	Groundwater	7
7	27.	Deserts & Wind	9
9	28.	Deserts & Wind/Glaciation	9/10
11	29	Glaciation	10
14	30.	Glaciation	10
16	31.	Glaciation/Geophysics	10/18
18	32.	Seismology (Earthquakes)	18
21	33.	Seismology and The Earth's Interior	18
THANKSGIVING BREAK			
28	34.	FILM: Earthquakes	
30	35.	EXAM #3 (Chapter 19 required reading)	
Dec. 2	36.	Oceans (Shorelines & Continental Shelves)	11
5	37.	Oceans (Deep Sea Processes)	11

Date	Lec. #	Topic	Text Chapter
Dec. 7	38.	Plate Tectonics (Continental Drift)	20
9	39.	Plate Tectonics (Paleomagnetism)	19
12	40.	Plate Tectonics Theory (Sea Floor Spreading/Subduction)	20
14	41.	Plate Tectonics Theory (Birth & Death of an ocean basin)	20
16	42.	Energy and Mineral Resources	23

Grading: The semester grade will be based on four exams, each worth 25% of the grade:

Exam #1, Sept. 30 - Covers material from lectures 1-10 (+Chapter 1)
Exam #2, Oct. 28- Covers material from lectures 12-22 (+Chapter 7)
Exam #3, Nov. 30- Covers material from lectures 24-34 (+Chapter 19)
Final Exam, (scheduled final exam period)
- Covers material from lectures 36-42 (+Chapter 23)

If mean (average) score of an exam is significantly lower than 75%, the assigned grades will be based on a curve, i.e., the scores will be "adjusted" slightly to establish a grading scale.

Make-up Policy: Anyone who misses, through illness or other emergency, Exam #1, #2, or #3 should plan on taking a make-up exam during the last week of classes. This exam will cover material from lectures 1-33. (comprehensive over the first 3/4 of the semester). One third of the questions in the makeup exam will be taken from each of the three quarters.

It will not be possible to improve the point total accumulated during the semester through "extra credit" assignments. Please put the "extra" effort into preparing for the lecture exams.

GS 121 Physical Geology

D. Richardson
Office 116 Walsh
Office: MF 1-2, W 1-4

Section 01A MWF 11:45-12:45
Walsh 104

Textbook: Skinner & Porter, 1987, Physical Geology

Course outline:

Introduction (what geology is about) Chapter 1, Origin of the Solar System Chapter 23, Plate Tectonics Chapter 2, geologic time, (memorize the geologic time scale p. 175, know eras, periods, and ages between eras) Chapters 7-8

Earth materials;
Minerals, rocks, rock cycle, hydrologic cycle, tectonic cycle: Chapter 2, Chapter 3, Chapter 4 (pp. 70-76,), Chapter 5 (pp. 101-103), Chapter 6 (pp. 138-140)

Internal processes:
Earthquakes, seismicity, the interior of the Earth, plate tectonics revisited: Chapters 16 and 17
Magmatism and igneous rocks: Chapter 4
Metamorphism and metamorphic rocks: Chapter 6
Crustal deformation: Chapter 15
Evolution of ocean basins and continents: Chapter 18

External processes:
Weathering and erosion, formation of sedimentary rocks: Chapters 5 and 9
Transportation mechanisms:
- Mass movement downslope: Chapter 9
- Streams: Chapter 11
- Groundwater: Chapter 10
- Ice: Chapter 13
- Ocean waves and currents: Chapter 14
- Wind: Chapter 12

Plate tectonics revisited Chapters 16-18
Economic geology: Chapters 21 and 22
Environmental geology--some basic principles

Course assessment:

Your grade for the course will be based on 4 tests. Exam questions are of two types--questions designed to encourage you to develop a particular line of reasoning to solve a problem and questions designed to consolidate what you have learned in lectures and readings. By necessity, so that we share a common vocabulary and understanding, the major part of each test will consist of recall and/or memorization-type questions (as examples: definitions, memorization of the geologic time scale, memorization of different rock types, etc.). Letter grades are based on the following percentages of correct answers: $\geq$ 90% = A; 89-80% = B; 79-70% = C; 69-60% = D; $\leq$ 59% = F when the class mean has be adjusted to 75%, if necessary. All exams are closed book and closed door: this means that you should have only a pencil at your desk when taking the test (op-scan, computer graded) and that once you start the test you should remain in your seat until ready to turn in your exam. Tentatively the exams are scheduled for Sept. 30, Oct. 26, Nov. 21, and week of final exams Dec. 17-22; each exam will cover 10 days of lecture material.

GS 123 - 001
INTENSIVE PHYSICAL GEOLOGY LAB
Syllabus

Section 001
Dr. J.F. Taylor
102 Walsh Hall

OFFICE HOURS
M 10:15-11:45/1:00-2:00
T 10:45-11:45
W 10:15-11:45

Date	Lab #	Topic/Exercise
Sept. 12	0	Introduction
19	1	Mineral Identification (Rock-forming)
26	2*	Mineral Identification (Economic)
Oct. 3	3	Igneous Rocks
10	4*	Sedimentary & Metamorphic Rocks
17	5	FIELD TRIP: Torrance, PA
24	6	MIDTERM (Rock & Mineral Identification)
31	7*	Topographic Maps
Nov. 7	8	FIELD TRIP: Coal Geology (or) Hydrology Field Trip
14	9	Structural Geology
21	10	FIELD TRIP: Strangford, PA
28	11*	Geologic Maps
Dec. 5	12*	Geomorphology
12	13	FINAL EXAM (Including Select Minerals & Rocks)

Grading: Based on:

a) Five scheduled quizzes (at beginning of labs marked with asterisks). (60-70 points)

Quiz #1 - Rock-forming Minerals (Exercise #1)
Quiz #2 - Economic Minerals & Igneous Rocks (Ex. 2,3)
Quiz #3 - Torrance Field Trip (Ex. 5) & Intro Material for Topo. maps (Ex. 7)
Quiz #4 - Topo. Maps & Structural Geology (Ex. 7, 9)
Quiz #5 - Strangford Field Trip & Geologic Maps (Ex. 9, 11)

b) At least one "Pop Quiz" on Intro Material (10-30 points)

c) Two Exams (100 points each)

1. Midterm (Rock & Mineral ID)
2. Final Exam (Maps, Field Trips, some rocks & minerals)

All exams and quizzes are "closed book"
Quizzes cannot be made up if a lab is missed.

PHYSICAL GEOLOGY LABORATORY
GS 122

Dr. K.R. Cercone
112 Walsh Hall
Office Hours: MWF 1-3 pm

Week	Lab Topic
1	Exercises in scientific reasoning
2	What is the earth made of: mineral classes
3	Where do our resources come from: mineral deposits
4	Predicting volcanic hazards: igneous rocks
5	Reading the earth's history: sedimentary/metamorphic rocks
6	FIELD EXERCISE: the landscape of ancient Pennsylvania
7	MIDTERM EXAM
8	Environmental damage: mining and waste disposal
9	FIELD EXERCISE: how well does reclamation work?
10	Hydrologic data: where does our water come from?
11	Structural geology: locating construction sites
12	Topographic maps: locating flood hazards
13	Geologic maps: locating earthquake hazards
14	FINAL EXAM

Grading: Your grade will be based on weekly quizzes worth 10 points each and two exams worth 100 points each. All exams and quizzes are "closed book."

Text: Physical Geology Lab Manual (available at Kinko's)

GS 131 Historical Geology
Spring Semester, 1988
Tentative Course Outline

Section 01A
Dr. J.F. Taylor — M 10:15-11:45
Office 102 Walsh — W 10:15-11:45/1:30-3:30

Textbook: Stanley, (1986), Earth and Life Through Time, W.H. Freeman and Company, N.Y.

Date	Lecture	Topic	Text Chapter
Jan 20	1	Introduction: History of Geology: Basic Principles	1
22	2	History of Geology/Basic Principles	1
25	3	Geologic Time: Development of a Relative Time Scale	1
27	4	Geologic Time: Absolute Age Dating	5
29	5	Paleontology/Fossil Preservation	1, Appendix II
Feb 1	6	Organic Evolution	6
3	7	Organic Evolution	6
5	8	Modern Stratigraphic Principles	5
8	9	The Geosyncline Concept & Plate Tectonics	7,8
10	10	EXAM #1 - (Required Reading Chapter 6)	
12	11	Major Tectonic Settings and Associated Rock Types	8
15	12	Earth's Origin and Early History	9
17	13	Evolution of Earth's Atmosphere and Hydrosphere	9
19	14	The Archean Physical Record	9
22	15	Archean Life	9
24	16	Proterozic Physical Record	10, 11
26	17	Proterozoic Life	10
29	18	The Cambrian System	12
Mar 2	19	Cambrian Life	12
4	20	EXAM #2 (Required Reading - Chapter 10)	
14	21	The Ordovician System	12
16	22	Ordovician Life	12
18	23	The Silurian System/Silurian Life	13
21	24	The Devonian System	13
23	25	The Devonian System/Devonian Life	13
25	26	The Mississippi System/Mississippian Life	14
28	27	The Pennsylvania System	14
30	28	The Pennsylvania System/Pennsylvanian Life	8, 14
Apr 1	29	The Permian System	14
5	30	The Permian System/Permian Life	14
6	31	The Triassic System/Triassic Life	15
8	32	EXAM #3 (Required Reading - Chapter 8)	
11	33	The Jurassic System	15
13	34	The Cretaceous System	16
15	35	Jurassic-Cretaceous Life	15,16
18	36	Jurassic-Cretaceous Life	16
20	37	The Paleogene System	17
22	38	Paleogene Life	17
25	39	The Neogene System	18
27	40	Neogene Life	18
29	41	Geoscience Day	

Pleistocene Glaciation
Final Exam (in specified period during Finals Week)
(Required Reading - Chapter 18)

Course grade based on the 4 exams, each worth 25% of final grade; last of the 4 exams is a non-comprehensive final exam. Each exam will consist of 40 multiple choice questions (38 questions from lecture material and 2 questions from a specified text chapter).

Make-up Policy - a single make-up exam, comprehensive over the first 3/4 of the semester, will be given in the last week of classes to those who missed one of the first three exams.

NO EXTRA CREDIT WORK POSSIBLE.

GS 131 02A - HISTORICAL GEOLOGY

	LECTURE TOPIC	READING IN STANLEY (1986)
Jan 20	The geologic time scale	Chapter 1
22	Radiometric age dating	Chapter 5
25	Relative timing	
27	Evolution	Chapter 6
29	Biostratigraphy	
Feb 1	Plate tectonics	Chapter 7
3	More plate tectonics	
5	Mountain building	Chapter 8
8	The making of a planet	Chapter 9
10	The Archean world	
12	North America: 3800-2500 Ma.	
15	Life begins with mud and slime	
17	Early atmospheres & oceans	Chapter 10
19	Symbiosis and sex	
22	The Proterozoic world	Chapter 11
24	North America: 2500-590 Ma.	
26	FIRST HOURLY EXAM	
29	an overview of the Phanerozoic	
Mar 2	The Early Paleozoic world	Chapter 12
4	North America: 590-438 Ma.	
	SPRING BREAK	
14	New critters in the sea	
16	Reefs	
18	Plants on land	Chapter 13
21	FILM: Life on earth	
23	FILM: Life on earth	
25	The Middle Paleozoic world	
28	North America: 438-360 Ma.	
Apr 30	North America: 360-248 Ma.	Chapter 14
1	The Late Paleozoic world	
5	Animals on land	
6	Life in wet and dry times	
8	SECOND HOURLY EXAM	
11	The Mesozoic world	Chapter 15
13	North America: 248-65 Ma.	
15	The rise and fall of the dinosaurs	Chapter 16
18	Flowering planets and grasses	
20	Mammals take over	Chapter 17
22	The Cenozoic world	Chapter 18
25	North America: 65-0 Ma.	
27	The Ice Ages	
29	GEOSCIENCE DAY	
May 2	Review	

GS 131 - 02a
HISTORICAL GEOLOGY

Instructor: Karen Rose Cercone

Office: 112 Walsh

Office Hours: Mon., Tue., Wed. 9:30-11:30

Course text: S.M. Stanley, Earth and Life Through Time. There will be questions based on the assigned reading in all three exams.

Course mechanics: There will be two 1-hour exams in class (each worth 100 points) and one 2-hour comprehensive final (worth 150 points). All exams will consist of short essay, diagram interpretation and identification questions. Exam grades will be adjusted to a mean of 75% so that 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; and below 60% = F.

In addition, a 100-point research paper will be due on April 22. In five pages this paper should discuss the age, fossil content and geologic history of a single rock formation. Topics will be assigned on February 29 to allow use of libraries other than IUP during spring break. If you have a favorite area of the country or a favorite time period, please see KRC before February 29 to arrange your own topic. Be warned. 3 points will be subtracted from your paper score for each day it is late.

There will be one make-up exam given on April 15 which can be used if either of the first two exams are missed. This exam will be considerably more difficult, as it will intergrate material from the first eleven weeks of the course. No other make-up exams will be given without official medical request.

GS 133 - 002
INTENSIVE HISTORICAL GEOLOGY LAB
SYLLABUS

Instructor: Karen Rose Cercone
Office: 112 Walsh
Hours: Mon 2:15-5:15; Tue 10:30-11:30; Wed 4:15-5:15

Jan 20	Introduction
Jan 27	Primary sedimentary structures, depositional environments and geological history
Feb 3	Introduction to fossils
Feb 10	Classification of fossils: proterozoa through mollusca
Feb 17	Classification of fossils: arthropoda through plants
Feb 24	Fossils: age and environment
Mar 3	FIRST EXAM
Mar 10	Field trip: fossils and environments (Shelocta PA)
Mar 17	SPRING BREAK
Mar 24	Introduction to geological maps and cross-sections
Mar 31	Field trip: Structure and stratigraphy, Conemaugh water gap (Bolivar PA)
Apr 7	Structural evolution of Pennsylvania (Paleozoic) and the Appalachians
Apr 14	Field trip: Allegheny Front/Valley & Ridge (Altoona PA)
Apr 21	NO LAB (Monday schedule)
Apr 28	Structural evolution of Pennsylvania (Mesozoic and Cenozoic) and some western structure
May 5	FINAL EXAM

Lab manual: Hall, Richardson & Taylor, 1987, General Geology II Lab Manual

Grades: Each exam will be worth 100 points. Grades will be adjusted to a mean of 75% so that 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; and below 60% = F. Each lab assignment handed in will be worth 10 points.

GS 132 - 001
HISTORICAL GEOLOGY LAB
SYLLABUS

Instructor: Karen Rose Cercone
Office: 112 Walsh
Hours: MWF 1-3

WEEK	LAB ASSIGNMENT
1	Introduction to scientific method
2	Using sedimentary structures to reconstruct geological history
3	The history of life: what is the record?s
4	Fossil groups: ancestral relationships
5	Fossil groups: lifestyles determine structure
6	Dating rocks: an exercise in reconstructive reasoning
7	MIDTERM
8	FIELD EXERCISE: what do fossils tell us?
9	SPRING BREAK
10	Earth history recorded in rock distribution
11	FIELD TRIP: tectonic history of western Pennsylvania
12	Reconstructing the history of western Pennsylvania
13	Reconstructing the history of western Pennsylvania (continued)
14	FINAL EXAM

Grades in this course will be determined by five quizzes and two exams. Quizzes will be worth 15 points each whereas exams will be worth 100 points each.

Text for lab: Historical Geology Lab Manual (available at Hinkos)

REQUEST FOR NAME CHANGE AND ADDITIONAL LAB SECTION

DEPARTMENT: GEOSCIENCE
CONTACT PERSON: KAREN CERCONE
TIMETABLE: FALL 1989 IMPLEMENTATION (FOR LIBERAL STUDIES)

DESCRIPTION OF CHANGE:

1.) Catalogue description: see attachment

2.) Listing of changes:

OLD: GS 121 GENERAL GEOLOGY I
GS 122 GENERAL GEOLOGY I LABORATORY

NEW: GS 121 PHYSICAL GEOLOGY
GS 122 PHYSICAL GEOLOGY LABORATORY
GS 123 INTENSIVE PHYSICAL GEOLOGY LABORATORY

OLD: GS 131 GENERAL GEOLOGY II
GS 132 GENERAL GEOLOGY II LABORATORY

NEW: GS 131 HISTORICAL GEOLOGY
GS 132 HISTORICAL GEOLOGY LABORATORY
GS 133 INTENSIVE HISTORICAL GEOLOGY LABORATORY

3.) Justification of change:

In seeking to fulfill the new Liberal Studies standards for Natural Science requirements, three changes have been made in the introductory geology course GS 121/122 and 131/132. These are:

a.) The name of the course sequence has been changed to reflect the specific concepts being taught in each semester. This change brings IUP in line with most geology departments across the country and allows Liberal Studies students who take only one of these semester sequences to have an informative course title on their transcripts.

b.) The laboratory for Liberal Studies students (GS 122/132) has been reduced from three hours to two hours. It remains a one credit course. This brings Physical and Historical Geology in line with other Natural Science introductory courses such as Earth Science, Physical Science, etc.

c.) An additional intensive laboratory for Geology and Geoscience majors has been added (GS 123/133). This laboratory will introduce majors to the professional working techniques needed in upper-level geology classes. It will remain at three hours/one credit.

Please refer to detailed explanations for this change given in the Liberal Studies proposal document if there are any further questions.

NEW CATALOGUE DESCRIPTIONS:

GS 121 PHYSICAL GEOLOGY 3c-0l-3sh

Introduction to science of the earth: physical properties and processes of the earth's interior and crust and their interaction with surface processes which shape and modify the physical environment.

GS 122 PHYSICAL GEOLOGY LABORATORY 0c-2l-1sh
Should be taken concurrently with GS 121.

Identification of common rocks and minerals, introduction to geologic landforms and structures, analysis of the effects of geologic processes on the environment. Includes field trips.

GS 123 INTENSIVE PHYSICAL GEOLOGY LABORATORY 0c-3l-1sh
Should be taken concurrently with GS 121 by all Geology/Geoscience majors

Selected problems in rock and mineral identification, topographic and geologic mapping techniques. and geomorphology designed to prepare students for upper-level geology classes. Includes field trips.

GS 131 HISTORICAL GEOLOGY 3c-0l-3sh

Introduction to the history of the earth and the record of physical and biologic evolution.

GS 132 HISTORICAL GEOLOGY LABORATORY 0c-2l-1sh
Should be taken concurrently with GS 131

Use of geologic map interpretation. fossil identification and stratigraphic rock sequences to solve problems in earth history. Includes field trips.

GS 133 INTENSIVE HISTORICAL GEOLOGY LABORATORY 0c-3l-1sh
Should be taken concurrently with GS 131 by all Geology/Geoscience majors.

Selected problems in stratigraphic analysis, paleontology and structural geology designed to prepare students for upper-level geology classes. Includes field trips.

COURSE ANALYSIS QUESTIONNAIRE

Section A: Details of the course

1.) The new introductory geology sequence (GS 121/122/123 and 131/132/133) will fulfill the academic needs of both geology and geoscience majors, who will be prepared for upper-level course-work, and of non-science majors who would like to take a more rigorous Liberal Studies natural science option. These two different groups will share the same lecture but will enroll in completely separate labs.

2.) The changes in this course do not affect the content of any other courses offered by the Geoscience Department.

3.) Traditionally, the Geoscience Department has offered both two-hour and three-hour labs, but in different introductory courses. With the changes in this course, we will simply be offering both lab options within a single course.

4.) This course has been taught in its previous format for many years at IUP.

5.) This will not be a dual-level course.

6.) This is not a variable-credit course.

7.) All major institutions offer some form of introductory geology course to their students. All institutions that we know of allow this course to be taken as a distrbutional requirement by non-science majors.

8.) This course is not required by a professional society or agency.

Section B: interdisciplinary implications

1.) Each section of this course will be taught from start to finish by an individual instructor. Multiple sections of both lecture and two-hour labs will be offered each year to accomodate as many Liberal Studies students as possible. Evaluation policies between lab sections are kept consistent by use of the same lab exercises and lab manuals. Lecture sections use the same text and cover the same material (see syllabi).

2.) No additional or corollary courses are required, other than those included in this course sequence.

3.) No other departments offer any course which overlaps with the content of Physical and Historical Geology.

4.) Continuing Education students are welcome to enroll in this class.

Section C: Implementation

1.) Because the new course sequence GS 121/122/123 and GS 131/132/133 represent a revision of a pre-existing course at IUP, no new resources will be required to teach this course.

2.) No grants have been sought for this course, as there will be no additional costs involved in teaching it.

3-4.) GS 121 will be offered in two sections every fall and in one section in the spring. GS 131 will be offered in two sections every spring and frequently as one section in the summer, enabling those students who took GS 121/122/123 in the spring to finish the two-semester sequence before the next academic year. Each offering of GS 121 and 131 will be accompanied by multiple sections of GS 122 and 132, and by a single section of GS 123 and 133.

5.) Each lecture section (GS 121 and 131) can accomodate either 40 or 75 students, depending on availability of lecture rooms. Each lab section (GS 122/123/132/133) can accomodate only 24 students due to a limited number of laboratory benches.

6.) No professional society specifies enrollment limits for this course.

7.) The new GS 121/123 will be substituted for the old GS 121/122 as a required course for Geology and Geoscience majors and minors. Similiarly, the new GS 131/133 will substitute for the old GS 131/132 requirement. The number of free electives allotted to majors will not be changed in any way.