LSC Use Only
Number: _____
Action: _____
Date: _____

UWUCC Use Only
Number: 91-46
Action: _____
Date: _____

CURRICULUM PROPOSAL COVER SHEET
University–Wide Undergraduate Curriculum Committee

I. Title/Author of Change

Course/Program Title: GS 338 Geology of the American Southwest
Suggested 20 Character Course Title: Geol American SW
Department: Geoscience
Contact Person: Darlene Richardson

II. If a course, is it being Proposed for:

X Course Revision/Approval Only
_____ Course Revision/Approval and Liberal Studies Approval
_____ Liberal Studies Approval Only (course previously has been approved by the University Senate)

III. Approvals

Darlene Richardson
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 to be implemented: Summer 1992

Date to be published in Catalog: Fall 1992

Catalog Description

GS 338 Geology of the American Southwest var-3sh

Prerequisite: Permission of instructor

A field study of the major geologic features and relationships exposed in the American Southwest, including the Colorado Plateau, the Rio Grande Rift, Death Valley, and parts of the Southern Rocky Mountains. (3 weeks, summer only)

Course Syllabus

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Course Objectives:

1. The student will understand and appreciate the major geologic features of the American Southwest and the geologic processes which created them.

2. The student will apply what he/she learned in previous geology courses to deduce the geologic history of the American Southwest.

3. The student will learn to record geologic observations and to maintain a road log and road map.

4. The student will learn how to camp and cooperate for a successful field experience.

Course Outline:

This course is a 3-week field study of the American Southwest. Thus, a detailed course outline is an itinerary. A preliminary meeting will be held during the Spring semester to acquaint student with what is expected of them, to hand out information on what to pack, ground rules for behavior on the field trip, medical information form, itinerary, and so on.

Day Program

1 Indiana: morning: division of students and faculty into working groups for camping responsibilities and driving; lectures on maintaining a field notebook and short field studies which the students will undertake at different stops. Afternoon: meal planning and purchase of food, packing field and camping equipment.

2 Indiana to Mammoth, KY: short stops along roadcuts to look at coal cyclothems

3 Mammoth Cave: tour of caverns, study of groundwater dissolution and precipitation; students will compare Mammoth Cave with Carlsbad Caverns; drive to Missouri

4 Missouri to Oklahoma: visits to classic turbidite sequences in the Arbuckle Mountains

5 Oklahoma to West Texas: stops along the way to see important rock formations such as the Paloduro caliche

6 West Texas: McKittrick Canyon (Permian reef complex): 5 mile hike up the canyon from the forereef to the main reef complex; Permian evaporites

7 West Texas to New Mexico: stops to look at the backreef part of the Permian reef complex, the Raderslide and Castile formations; Carlsbad Caverns; the Rio Grande Rift

8 Carlsbad to Alamogordo: White Sands: gypsum sand dunes; to Santa Fe

9 Santa Fe: free day (laundry, rest, a chance to put the previous 8 days' experiences in perspective)

10 Santa Fe to Los Alamos: volcanic structures of the Jemez Mts.; continue to Shiprock, NM to see erosional remnants and radiating dikes; Nacimiento Fault

11 Shiprock to Canyon de Chelly: 3 mile hike to study Canyon de Chelly eolian sand dunes; Monument Valley--erosional remanants

12 Canyon de Chelly to Petrified Forest: short hikes to study petrified wood and unconformities marked by basal conglomerates; continue to Flagstaff: Sunset Crater

13 Flagstaff to Grand Canyon (South Rim): study of Paleozoic sedimentary rocks, hike into canyon to look at the Precambrian sedimentary, igneous, and metamorphic rocks

14 Grand Canyon--South Rim to North Rim, study of Mesozoic sedimentary rocks of Colorado Plateau

15 Grand Canyon to Page, AZ to Zion, UT: study of outcrops along the way of Paleozoic and Mesozoic sedimentary rocks in the Painted Desert and Vermillion Cliffs (collect fossils); contrast in weathering and erosional styles; tour of the Glen Canyon dam; discussion of environmental impact of coal mining and coal-fired electricity plants; study the sand dunes at Coral Sand Dunes and the Sevier Fault

16 Zion National Park: study eolian cross-bedding in Mesozoic sedimentary rocks (compare with what we saw at Canyon de Chelly); study of weathering of these rocks and fluvial erosional features (entrenched meanders of the Virgin River and hanging valleys)

17 Zion to Death Valley: study of the Death Valley rift; evaporites; landslides and debris flows; playa lakes

18 Death Valley to Hoover Dam to Bryce Canyon: study of Mesozoic and Cenozoic sedimentary rocks, study the sequence of younger sedimentary rocks and what they tell us of the geologic history of this area; different weathering and erosional processes; Bryce to Capitol Reef National Park to Arches National Park: study of primary sedimentary structures and erosional structures

19 Arches to Mesa Verde (visit cave dwellings) to Durango

20 Durango to Indiana

21 Unpack vans, check field equipment, rest

22 Exam

Evaluation Methods:

The student will keep a daily journal which will cover geological as well as logistical topics. We expect you to record your observations daily. You will also be given quizzes (3 or 4) while we are on the road. The quizzes will be of the short essay type and will cover field observations as well as assigned readings. There will be a final exam when we return to Indiana. This exam will contain short essay and longer essay questions which will ask you to synthesize what you have learned. You will turn in your field notebook after the test and it will be graded. You will also be graded on participation--paying attention, showing cooperation and enthusiasm, asking questions, discussing geology with your colleagues, and fulfilling your camping responsibilities.

Summary of course assessment:

40% field notebook
10% quizzes (3 or 4)
30% final exam
20% participation

Required textbooks:

There are no required textbooks, although there will be required readings in the vans (one set of readings, maps, field guides, etc.) in each van. You are expected to keep up with the assigned readings and to read on your own from the materials in our "van libraries." Harris and Tuttle, 1983, Geology of the National Parks, 3rd ed. and the AAPG Geological Highway Map of the U.S. Southwest will be helpful. We will have these in the vans also, but you may want to purchase your own copies. You must have a map of the contiguous U.S.

Special Resource Requirements:

Be sure to bring the following in addition to your other personal gear: clothes for both cold and warm (hot) weather--dress in layers; hat; boots and gym shoes; small backpack for daily use; water bottle or canteen; flashlight; sleeping bag; geopick; small first-aid kit with insect repellent, sunscreen, few bandaids, vaseline or lip balm, lotion for dry skin or for sunburned skin, ace bandage. Bring any necessary medication and let the instructors know what medicine (and where) you have. You will find that film is cheaper here than the film we can buy on the road in convenience stores. You must have a small hardcover notebook for your journal.

Bibliography

Harris, Ann and Esther Tuttle, 1983, Geology of National Parks, 3rd ed.: Kendall-Hunt (Dubuque), 554 p.

Harris, David and Eugene Kiver, 1985, The Geologic Story of the National Parks and Monuments, 4th ed.: Wiley (N.Y.), 464 p.

Geologic maps of states of the Southwest

Many geological guidebooks of the Southwest including:

Chronic, Halka, 1985-1989, Roadside Geology of New Mexico, Roadside Geology of Utah, Roadside Geology of Arizona, Roadside Geology of Colorado: Mountain Press (Missoula, MT), about 150-200 pages each

DNAG (Decade of North American Geology) Guidebooks published in 1987: 6 volumes

Many articles from recent geological journals such as Bulletin of the Geological Society of America, Geology, Univesity of Arizona Notes.

Course Analysis Questionnaire

Section A: Details of the Course

A1: This course is intended for majors and minors in the Geoscience Department and for other students who have sufficient background in geology (as examples, archeology and geography majors). It is not a Liberal Studies course. This course acquaints our students with the geologic milieu of the Southwest--an area which has undergone more recent tectonic changes than those our students see in the Northeast. Field experiences are valuable for our students in that they see in nature what they have learned about in their lectures.

A2: No

A3: Yes, we have two other field courses which are similar in format.

A4: This course was offered as GS 481 Geology of the Southern Rocky Mountains in early summer 1989 and was taken by 13 students who were primarily majors and minors in the Geoscience Department, although we did have one anthropology major and one English major (both of whom had sufficient previous coursework in geology). This course was successful not only in the study of geology and environmental impacts of utilization of mineral resources, but was also eye-opening to those of our students who were not familiar with Hispanic or Native American peoples or their influences in the American Southwest. During the "free day" in Santa Fe, for example, most students visited natural history, ethnographic, and art museums and we, as a group, visited cliff dwellings in Arizona and Colorado.

A5: No

A6: No

A7: Many universities and colleges offer similar courses: as an example: Penn State University: GEOS 471: Field Studies in North America: An extended excursion to areas of geologic, mineralogic, and petrologic interest. Includes observations, recording and interpretation (3 sh).

A8: No

Section B: Interdisciplinary Implications

B1: This course will be taught by Richardson and Cercone. We are both in the field the full three weeks, but each is primarily responsible for one-half of the outcrop discussions. Students benefit greatly from hearing us disagree with each other about the mode of formation/origin of a rock or geologic structure and from our disagreeing with other geologists' printed interpretations.

B2: No

B3: This is the only geological field excursion to the American Southwest.

B4: Yes, if the students have sufficient breadth and depth in geology.

Section C: Implementation

C1: Resources are sufficient except for the aging of our 15-passenger vans. We have put a new van on our equipment request for AY 91-92.

C2: This course was taught in summer 1989 with financial assistance from a Senate Creative Teaching Award which paid for student wages (as drivers), books, maps, camping fees, and so on. We certainly appreciate the grant which purchased most of the books, maps, and field guides in the "van library."

C3: Every third summer in rotation with our other field courses.

C4: One

C5: 20 students maximum; controlled by our taking 2 vans

C6: No

C7: No