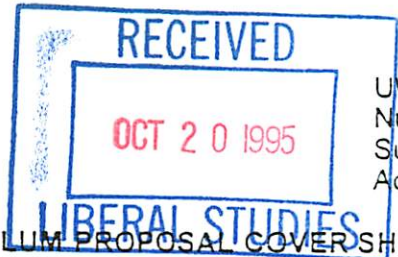


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Action-Date: \_\_\_\_\_



UWUCC USE Only  
Number: 95-41  
Submission Date: \_\_\_\_\_  
Action-Date: App 12/12/95  
Senate App 2/6/96

CURRICULUM PROPOSAL COVER SHEET  
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person Karen Rose Cercone Phone 5623  
Department Geoscience

II. PROPOSAL TYPE (Check All Appropriate Lines)

- COURSE Research Techniques  
Suggested 20 character title
- New Course \* GS 380 Research Techniques in Geoscience  
Course Number and Full Title
- Course Revision \_\_\_\_\_  
Course Number and Full Title
- Liberal Studies Approval + \_\_\_\_\_  
for new or existing course Course Number and Full Title
- Course Deletion \_\_\_\_\_  
Course Number and Full Title
- Number and/or Title Change \_\_\_\_\_  
Old Number and/or Full Old Title  
\_\_\_\_\_  
New Number and/or Full New Title
- Course or Catalog Description Change \_\_\_\_\_  
Course Number and Full Title
- PROGRAM:  Major  Minor  Track
- New Program \* \_\_\_\_\_  
Program Name
- Program Revision \* \_\_\_\_\_  
Program Name
- Program Deletion \* \_\_\_\_\_  
Program Name
- Title Change \_\_\_\_\_  
Old Program Name  
\_\_\_\_\_  
New Program Name

III. Approvals (signatures and date)

Karen Rose Cercone 4-7-95 Department Curriculum Committee  
John D. Ed 4-7-95 Department Chair  
John D. Ed 10/20/95 College Dean

+ Director of Liberal Studies (where applicable) \*Provost (where applicable)

## II. DESCRIPTION OF THE CURRICULUM CHANGE

### COURSE SYLLABUS: GS 380 Research Techniques in Geoscience

#### I. Catalog description

<b>GS 380 Research Techniques in Geoscience</b>	2 credits
	2 lecture hours
Prerequisites: Second-semester junior standing	0 lab hours
(75 credits or permission of instructor)	(2c-0l-2sh)

For students majoring in some aspect of geoscience. Teaches students the techniques of geoscience research: defining a project; doing background research; proposing multiple working hypotheses and collecting evidence pertaining to each. Students will then write up their research in both abstract and professional manuscript format. Cannot be taken subsequent to GS 480.

#### II. Course Objectives

1. Students will synthesize the research skills acquired in upper-level geoscience courses by selecting and carrying out an actual research topic of their choice, using library resources and laboratory facilities at IUP and elsewhere. Each student will be mentored in their research project by an external IUP Geoscience faculty member in addition to the course instructor.
2. Students will learn and practice the diverse writing skills needed for conference abstracts, funding grants and technical papers in the geological sciences. Self-critiques and peer-critiques will allow students to prepare a 5-10 page manuscript summarizing their research results, as well as a professional-quality abstract for the follow-up course, GS 480 Geoscience Senior Seminar.

#### III. Course Outline

##### A. Introduction (2 hours)

Overview of course; review of previous student research at IUP; introduction to lab facilities, field equipment and available funding. Introduction to the method of multiple working hypotheses and review of scientific data-collection procedures.

##### B. Starting a Research Project (4 hours)

Use of geologic resources (libraries, professional journals, IUP professors, other professional geologists, scientific meetings) to define a research project. Individual student counseling by external IUP Geoscience faculty to select and begin a field-based, lab-based and/or library-based research project.

**C. Student Research Projects (16 hours)**

Students will carry out geologic research under the direction of their faculty mentor and report each week on their results. Meanwhile, the class will cover fundamentals of science writing: sentence structure, paragraph structure, report organization, use and abuse of illustrations, citation & bibliography styles, use of appendices. Lectures will be augmented by critical reading of scientific literature and by panel discussions among students.

**D. Research Writing (6 hours)**

Students will present and critique of abstracts of their research results to be used in the follow-up course GS 480: Geoscience Senior Seminar, which teaches techniques of oral presentation in the following spring semester. Students will also individually critique first drafts of their final scientific manuscripts, following actual scientific journal reviewing guidelines. Students will then have an opportunity to revise their work based on other students' input before turning in a final research paper.

**IV. Evaluation Methods**

The final grade for this course will be determined as follows:

- 10% class participation on panel discussions of papers
- 10% written reviews of academic papers
- 25% student oral research presentations
- 25% abstract writing
- 30% final research paper

**V. Required Textbooks, Supplemental Books and Readings**

All readings in this course will be taken from actual geologic sources: technical articles in the geologic literature, research proposals and published abstracts.

**VI. Special Resource Requirements**

None. Research projects will be done using existing IUP laboratory and field equipment. IUP library resources will be augmented by trips to the Pitt Geology and Engineering Libraries.

**VII. Bibliography**

Anonymous, 1992, Instructions to authors: Journal of Sedimentary Petrology, v. 62, inside cover.

Anonymous, 1992, Instructions to Bulletin authors: American Association of Petroleum Geologists Bulletin, v.76, p. ix.

Carson, R.J. and Sadd, J.L., Land-use-planning writing assignment for an environmental geology course: *Journal of Geologic Education*, v. 39, p. 206-212.

Cochran, W., 1985, *Geowriting*: American Geoscience Institute.

Davis, L.E., Eves, R.L., Corner, H.M. and Urbanczyk, K.M., 1991, Student abstract writing as a tool for writing across the curriculum in large introductory-geology courses: *Journal of Geologic Education*, v. 39, p. 178-180.

Hansen, W.R., 1991, *Suggestions to authors of reports of the United States Geological Survey*: US Government Printing Office.

Niemitz, J.W. and Potter N.P., 1991, The scientific method and writing in introductory landscape-development laboratories: *Journal of Geologic Education*, v. 39, p. 190-195.

MacDonald, R.H., 1991, Writing assignments challenge students in a physical geology course: *Journal of Geologic Education*, v. 39, p. 199-201.

## COURSE ANALYSIS QUESTIONNAIRE

### Section A: Details of the Course

- A1: Student research in the Geoscience Department was previously informal and squeezed into one semester, in conjunction with the oral-presentation course GS 480 Geoscience Senior Seminar. In order to give students a more structured and longer experience in conducting their own research, as well as more practice in writing up their research results, this course was designed as a "prequel" to GS 480. It will be taken in the Fall semester of the senior year by both **B.S. - Geology** and **B.S. - Environmental Geoscience** majors. GS 480 is traditionally offered in the subsequent Spring semester.
- A2: This course does not require any changes in content of other existing courses. It will allow students to focus on the original intentions of GS 480 -- oral presentation of the research they carried out the previous semester in this new course..
- A3: This course has never been offered previously at IUP.
- A4: This is not a dual-level course.
- A5: This is not a variable credit course.
- A6: I am not aware of other courses exactly like this one.
- A7: No external agency specifically requires the research and writing skills taught in this course; however environmental consultants commonly tell us that writing skills are the most important thing they look for in potential employees.

### Section B: Interdisciplinary Implications

- B1: This course will be taught by a single instructor for each offering. All instructors have been given the syllabus included here and have agreed to abide by the spirit and guidelines of this proposal.
- B2: This course does not overlap with any other courses at the University.
- B3: Students from Continuing Education are welcome in this course as long as they have second-semester junior standing in Geology or Environmental Geoscience.

**Section C: Implementation**

- C1: At present, faculty resources are adequate for teaching this course, provided we alternate existing upper-level courses to free up hours. In order to make room for a new upper-level course to be taught each fall, the department will offer sections of upper-level majors classes such as hydrogeology, geochemistry, oceanography and meteorology in alternate years. The release of 5 contact hours from those classes will free their instructors to teach GS 380 (two contact hours) and to either cover the two-hour increase in contact hours needed to implement our introductory course sequence (if approved by the University Senate) or to teach a three-contact hour Liberal Studies class. Thus, the addition of GS 380 to the schedule will actually provide more departmental seats for Liberal Studies and other non-major students, rather than fewer. Department majors will not be substantially penalized, since they will still have at least one opportunity in junior and senior years to take hydrogeology, geochemistry, oceanography and meteorology. Careful departmental advising will be done to ensure that no student fails to enroll in these courses at the proper time.
- C2: Other Resources
- a. Current space allocations are sufficient for this course.
  - b. No special equipment is needed to teach this course. The department is already planning to buy updated computers for students out of existing ESF funds, so all students will have access to word-processing facilities for this course.
  - c. The department budget is sufficient to buy supplies such as paper and printer cartridges.
  - d. Library holdings are adequate for this course, but not ideal. Field trips to the University of Pittsburgh Libraries will be made in department vans to consult references not held at IUP.
  - e. No travel funds are needed for this course.
- C3: No grant funds are associated with this course.
- C4: This course will be offered every year in the fall, planned to precede the spring offering of GS 480 (Geoscience Senior Seminar).
- C5: One section of this course will be offered a year.
- C6: A maximum of twenty-five students can be accommodated in this course. The number of senior department majors per year generally ranges from 10 to 16.

C7: No enrollment limits exist for a course of this type.

**Section D. Miscellaneous**

No additional information is necessary.