New Course Proposal

ESC/GEG/GEL 5590 Special Topics

1. Catalog description

5590 ESC/GEG/GEL. Special Topics. (Arr.-Arr.- 1 to 6) Su or F or S. Special Topics. Readings, discussion, reports, on-campus and/or off-campus fieldwork about specific areas or topics in earth science, geography or geology. May be repeated for credit if a different topic is taught. Prerequisite: Teaching certificate or bachelor’s degree in an appropriate field.

2. Objectives

To allow students the opportunity to study topics of special interest and/or timeliness not ordinarily covered in traditional courses.

3. Outline of the Course

Because the topics and setting of this course will vary, the outline will be unique each time the course is taught.

A sample outline for a 3 sh special topics course on Applications of Hydrologic Principles might go like this:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>The water cycle (molecular structure and properties of water).</td>
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| 2    | Water in the atmosphere (processes of evaporation and condensation).  
  Applications: Reduction of water loss by evaporation suppression; disposal of wastewater by evaporation; evaporative cooling of industrial waters. |
| 3 - 4| Precipitation (forms, types, measurement, patterns, analysis of data).  
  Applications: Weather prediction; weather modification; environmental effects of weather modification. |
| 5    | Infiltration (properties of soil, zones of subsurface water, processes of infiltration, storage and migration).  
  Applications: Irrigation; domestic water; groundwater recharge. |
Evapotranspiration (processes of transpiration, measurement of evapotranspiration, phreatophytes).

*Applications:* Crop demands for water; waste water disposal; effects on runoff.

Exam #1

Groundwater (areas of natural storage, recharge and discharge, measurement of groundwater table.)

*Applications:* Aquifer resource determination; water surplus storage; contamination trends.

Runoff (streamflow measurements, seasonal cycles, affects of climate and landuse).

*Applications:* Flood probability studies; reservoir water balance; soil erosion and sediment transport; watershed analysis.

Chemical qualities of natural waters (salinity, dissolved solids, circulation of dissolved solids).

*Applications:* Mineral extraction from natural waters; effects on agricultural systems; affects on human body.

Historical perspectives on human use of water (beginnings of civilization, the middle ages, modern times).

*Applications:* An understanding of the breakthroughs in use and mistakes made; future prospects for the world’s water supply.

Exam #2

Evaluation of student performance will be based on performance on weekly in-class lab exercises, two examinations, a term paper on applied hydrology and the quality of input into class discussions.

4. Implementation

a. This course will be taught by qualified members of the Geology/Geography faculty. Number of hours credit to be offered (1-6), as well as background preparation of students, will be determined by the Department Chair, in consultation with the assigned faculty member.

2. No major extra costs to students unless a field trip or other special project is involved. These costs will be explained to students prior to enrollment in the course.
3. Textbooks will be selected based on the chosen topic. For the sample course provided, the textbooks may be: John C. Manning, Applied Principles of Hydrology, 2nd edition, 1993, MacMillan Publishing Company.

4. This course may first be offered in Summer of 2001.

5. Rationale

1. There is a need to provide practicing professional educators and other practicing professionals, with knowledge and experiences relating to new and emerging concepts and theories in earth sciences, geography or geology.

2. The level of this course is justified because all participants of this course will hold baccalaureate degrees. Many will be teaching earth science, geography or geology related subjects but will be seeking additional education in specific areas. Other professionals may need to enhance their knowledge on appropriate topics.

3. This course offers the opportunity to present knowledge not found in other courses, so there will be no similarity to existing courses.

4. This course is neither a requirement nor an elective in any program. It serves to provide additional training to practicing teachers who have an interest or need for the subject. The course will also serve to enhance the knowledge base for other professionals who seek additional background on specific topics.

6. Community College Transfer

Not applicable.

7. Date approved by the Geology/Geography Department 12-8-00

8. Date approved by the College of Sciences curriculum committee 1-26-01

9. Date approved by the CGS 3-8-01