PROPOSAL NUMBER: 99- 414 (R)
95-99-414

CURRICULUM PROPOSAL FORM

DEADLINES:
REGULAR COURSE PROPOSALS: OCTOBER 23, 1998 FOR FALL, 1999 AND FEBRUARY 19, 1999 FOR SPRING, 2000
SHORT-TERM COURSE PROPOSALS: DECEMBER 11, 1998 FOR FALL, 1999 AND MARCH 26, 1998 FOR SPRING 2000

PROPOSAL TITLE: Solid and Hazardous Waste Management

SPONSOR/S: Ralph Alan Dusseau

DEPARTMENT: Civil Engineering CIVE. 531

CHECK ALL THAT APPLY:
____UNDERGRADUATE ___x___GRADUATE

COLLEGE: Engineering
If LAS: ____History/Humanities
____ Math/Sciences
____Social/Behavioral Sciences

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TYPE OF PROPOSAL *(Check ALL that Apply)*

____General Education
___*New Course in* _____*Bank*
___*Existing course, Add To* _____*Bank*
___*Multicultural/Global Designation*
___*Writing Intensive Designation*

____ New Minor/Concentration/Specialization
____ New Major/Degree Program
____ Short Term Course Proposal

___x___ New Course (NOT Gen. Ed.)
____ Name Change (Dept., School, Major)
____ Changes in Degree Requirements
___*Changes Involve Gen. Ed. requirements*

____Minor Changes to Existing Courses
____ *Course is NOT General Education*
____ *Course IS General Education*

DEPARTMENT
(SIGNATURE INDICATES APPROVAL)

10/5/98 — DEPT. CURRICULUM CHAIR / DATE
10/5/98 — DEPT. CHAIRPERSON / DATE

COLLEGE CURRICULUM COMMITTEE
DATE OF OPEN HEARING (if necessary) 2/9/99
X APPROVED
— NOT APPROVED
COMMENTS:

Robert P. Hesketh 2/9/99
SIGNATURE DATE

ACADEMIC DEAN (& GRADUATE DEAN, for New Graduate Programs Only)
✓ APPROVED
— NOT APPROVED
COMMENTS:

10/19/98
SIGNATURE (Academic Dean) DATE

SIGNATURE (Graduate Dean) DATE

UNIVERSITY CURRICULUM COMMITTEE

DATE OF OPEN HEARING (if necessary) 2/5/99 (College hearing only)

✓ APPROVED

— NOT APPROVED

COMMENTS:

[signature] 3/4/99

SIGNATURE DATE

SENATE

Date announced at Senate 2/23/99

Voted upon at Senate: Approved Not Approved Date:

EXECUTIVE VICE PRESIDENT/PROVOST

_____APPROVED

_____NOT APPROVED If no, reasons are as follows:

STUDENT CREDIT HOURS ______ FACULTY LOAD HOURS ________ EQUALIZED CREDIT HOURS______

OFFICIAL COPY & APPROVAL SHEET FILED (DATE): _____

DATE/SIGNATURE EXECUTIVE VICE PRESIDENT/PROVOST [signature]

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED ___________

HEGIS TAXONOMY & COURSE NUMBER ASSIGNED 0908 531

DATE/SIGNATURE OF REGISTRAR Robert A. Kubat 3/25/99

NOTIFICATION FORWARD:

✓ SENATE CURRICULUM COMMITTEE CHAIRPERSON

✓ DEPARTMENT CHAIRPERSONS

✓ ACADEMIC DEAN(S)

✓ REGISTRAR

SPONSOR(S)

TM 3/31/99

curricul/curfrms.989/9899prop.wpd

3. Essence of the Course:

a) Objectives:

Upon completion of the course, civil and environmental engineering graduate students will be able to do the following:

- Apply the environmental regulations for solid and hazardous wastes.
- Understand the management practices, treatment and disposal methods of solid and hazardous wastes.
- Understand the basic principles of toxicology and risk assessment.

b) Topical Outline:

The instructor will supply the students with a syllabus during the first week of classes. The instructor will assess any engineering technology advances and make necessary topic changes as deemed appropriate to maintain the standards of the course. Graduate students will be expected to attain a higher level of understanding of the topics covered compared with undergraduate students who are taking the undergraduate version of this course. The topics to be covered are listed below:

- Introduction to Solid and Hazardous Wastes:
  - Working Definition
  - Classification and Generation
  - Historical Roots and Landmark Episodes
- The Regulatory Process:
  - Environmental Laws:
    - Resource Conservation and Recovery Acts (RCRA)
    - Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
    - Toxics Substance Control Act (TSCA)
  - Other Federal Regulations
- Solid Wastes:
  - Collection, Transfer and Transport
  - Processing Techniques and Equipment
  - Recovery of Resources, Conversion Products and Energy
  - Disposal of Solid Wastes:
    - Site Selection
    - Landfill Design and Operation
    - Incineration
    - Other Disposal Methods

Hazardous Wastes:
- Toxicology:
  - Principles of Toxicology:
    - Dose Response Relationships
    - Carcinogens and Non-Carcinogens
    - Toxic Effects
  - Ecotoxicology
  - Risk Assessment:
    - Hazard Identification
    - Exposure Assessment
    - Toxicity Assessment
    - Risk Characterization
  - Site Remediation:
    - Site and Subsurface Characterization
    - The Remedial Investigation/Feasibility (RI/FS) Study
    - Treatment and Disposal Methods
    - Containment

c) Evaluation and Grading Procedure of Students:

Student grades will be based on team problems, team projects, team lab reports, individual examinations, and individual homework.

d) Course Evaluation:

The proposed course will be evaluated based on student evaluations and curriculum review by engineering faculty.

4. Results of Consultations:

The proposed course is part of the Engineering Curriculum Proposal approved by the College Senate in December 1994. Consultations were submitted with the original proposal as specified by the Curriculum Committee. Additional consultations were sought from the Biological Sciences Department and the Department of Chemistry and Physics. A letter of consultation was received from the Biological Science Department.

Catalog Description:

Solid and Hazardous Waste Management (0908.531)

Prerequisites: Permission of Instructor

The course deals with solid and hazardous waste sources, regulations and management; engineering principles, treatment and disposal methods; design of landfills; recycling; toxicology principles; and risk assessment. The course includes appropriate laboratory experiments and computer applications.

Course Proposal:

1. Details:

a) Course Title: Solid and Hazardous Waste Management

b) Sponsor: Civil Engineering Curriculum Committee

c) Credit Hours: 3 credit hours

d) Course Level: Graduate (0908.531)

e) Curricular Effect: Elective course for civil and environmental engineering graduate students

f) Prerequisites: Permission of Instructor

g) Suggested Time/Scale of Implementation: One section every other spring semester

h) Resources:

Faculty: Existing faculty will teach this course.

Library: Library acquisitions will be required.

Equipment: Laboratory space and appropriate experimental equipment for solid waste management analysis and design will be required.

Computers: Computer laboratory space and appropriate environmental engineering analysis and design software will be required.

2. Rationale:

This course is the graduate version of the course entitled "Solid and Hazardous Waste Management for Seniors" which was approved by the University Senate and which was recently renamed.

The purpose of the course is to give civil and environmental engineering graduate students a working knowledge of the rapidly growing field of solid and hazardous waste management. This knowledge is essential for civil and environmental engineers who work in the area of environmental engineering.