PROPOSAL TITLE: Civil Engineering Systems 2/90/130

CHECK APPROPRIATE: ___ UNDERGRADUATE ___ GRADUATE ___ SEMESTER HOURS

SPONSOR(S): Ralph Alan Dusseau and College of Engineering Curriculum Committee

DEPARTMENT/TELEPHONE #: 256-4628

CHECK ONE: ___ COURSE ___ MINOR PROGRAM ___ CONCENTRATION ___ SPECIALIZATION
___ ACHIEVEMENT CERTIFICATE ___ CERTIFICATION PROGRAM ___ MAJOR PROGRAM

Step #1 (Department)
___ Approved (Date) 10/12/97
___ Not Approved (Date)

Dept. Curriculum Chr.

10/12/97
Reviewed (Date)

Dept. Chr.

Step #2 (Receipt)

SCC# 97-98-124

10/24/97
Date Received Senate

Senate Curriculum Chr.

Step #3 (School)

Reviewed Date: 10/12/97

___ Recommend to Approved
___ Recommend NOT to Approve

Forward for Open Hearing:
___ WITHOUT Reservations
___ WITH Reservations:

Comments:

School Committee Chr.

Step #4 (Academic Dean): ___ Recommended ___ NOT Recommended ___ Conditionally Recommended (See Comments)

Comments:

Dean Signature/Date 10/12/97

Step #5 (Senate Curriculum Committee): Open Hearing Date: Approved by Curriculum Committee Date

Returned to Sponsor(s) for the following reason:

Step #6 (Senate) Date announced/voted on at Senate ___ If voted on: ___ Approved ___ NOT Approved

Date forwarded to Executive Vice President/Provost 2/5/98

Senate Curriculum Committee chair Signature/Date 2/5/98
Step #7 (Executive Vice President/Provost): Date Received

Approved

NOT Approved If no, reasons are as follows:

Student Credit Hours

Faculty Load Hours

Equalized Credit Hours

Official Copy & Approval Sheet Filed (Date) 2/14/98

Executive Vice President/Provost Signature

Registrar

Date Approved Course Description Received 2/24/98

Hegis Taxonomy and Course Number Assigned 0108-365

Date/Signature of Registrar 3/2/98

Notification Forward:

☑ Senate Curriculum Committee Chairperson

☑ Department Chairpersons

☑ Academic Dean(s)

☑ Registrar

☑ Sponsor(s)
Course Proposal:

1. Details:

a) Course Title: Civil Engineering Systems

b) Sponsor: Dr. Ralph Alan Dusseau and College of Engineering Curriculum Committee

c) Credit Hours: 2 credit hours

d) Course Level: Junior (0908.305)

e) Curricular Effect: Required course for all undergraduate civil engineering students

f) Prerequisites: Microeconomics and Civil Engineering Materials

g) Suggested Time/Scale of Implementation: One section during spring semesters

h) Resources

   Faculty: Existing faculty can teach this course.

   Library: No library acquisitions will be required.

   Equipment: No laboratory equipment will be required.

   Computers: Computer laboratory access will be required and additional software may be required.

2. Rationale:

The proposed course is an additional required course for all undergraduate civil engineering students. The inclusion of this course in the civil engineering curricula is consistent with the goals of the original civil engineering curricula which were approved by the University Senate in December 1994 and which were subsequently revised and approved in May 1996 and May 1997.

The course introduces students to the theories and principles of civil engineering systems as applied to real-world analysis and design problems. The course covers four of the
most-important areas of civil engineering systems: linear programming, project scheduling, probability and statistics, and engineering economics. Thus, this course will serve as a logical introduction to the senior capstone design project.

3. Essence of the Course:

a) Objectives:

Upon completion of the course, civil engineering students will be able to solve civil engineering analysis and design problems including the ability to perform the following tasks:

Solving problems using linear programming including:
   Solving linear programs graphically
   Solving linear programs using the simplex algorithms
   Applying sensitivity analysis

Scheduling using the critical path method including:
   Using arrow diagrams
   Utilizing activity diagrams
   Using bar charts
   Utilizing resource leveling

Using probability and statistics including:
   Utilizing random sampling
   Using the method of regression
   Utilizing computer simulation
   Applying statistical analysis in water resources
   Applying statistical analysis in transportation

Assessing economic impact of decisions including:
   Developing benefit-cost ratios
   Conducting rate-of-return analysis
   Calculating pay-back periods
   Utilizing break-even analysis

b) Topical Outline:

The topical outline of the course may vary to some extent depending on the interests of the instructor and the students. The topics to be covered will include the following:

Linear Programming:
   Graphical Solutions
   Simplex Algorithms
Sensitivity Analysis

Critical Path Method:
   Arrow Diagrams
   Activity Diagrams
   Bar Charts
   Resource Leveling

Probability and Statistics:
   Random Sampling
   Method of Regression
   Computer Simulation
   Statistical Analysis in Water Resources
   Statistical Analysis in Transportation

Engineering Economics:
   Benefit-Cost Ratios
   Rate-of-Return Analysis
   Pay-Back Periods
   Break-Even Analysis

c) Evaluation and Grading Procedure of Students:

   Student grades will be based on individual examinations and individual and group homework.

d) Course Evaluation:

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

4. Results of Consultations:

   The proposed course is an additional required course that supplements the civil engineering curricula and is consistent with the original civil engineering curricula which were approved by the University Senate in December 1994 and which were revised and approved in May 1996 and May 1997. Consultations were submitted with the original civil engineering curricula proposal as specified by the University Curriculum Committee.
Catalog Description:

Civil Engineering Systems (0908.305)

(Prerequisites: Microeconomics and Civil Engineering Materials)

The course deals with the theories and principles of civil engineering systems as applied to real-world analysis and design problems. The course covers four important areas of civil engineering systems: linear programming, project scheduling, probability and statistics, and engineering economics. The course includes appropriate computer applications.