

ROWAN UNIVERSITY CURRICULUM PROPOSAL

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PROPOSAL TITLE:
Civil Engineering Systems 0908-305

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

<p>Step #1 (Department)</p> <p><input checked="" type="checkbox"/> Approved (Date) <u>10/20/97</u></p> <p><input type="checkbox"/> Not Approved (Date)</p> <p><u><i>[Signature]</i></u> Dept. Curriculum Chr.</p> <p><u>10/20/97</u> Reviewed (Date)</p> <p><u><i>[Signature]</i></u> Dept. Chr.</p>	<p>Step #2 (Receipt)</p> <p>SCC# <u>97-98-174</u></p> <p><u>10-24-97</u> Date Received Senate</p> <p>_____ Senate Curriculum Chr.</p>	<p>Step #3 (School)</p> <p>Reviewed Date: <u>10/20/97</u></p> <p><input checked="" type="checkbox"/> Recommend to Approved <i>[Signature]</i></p> <p><input type="checkbox"/> Recommend NOT to Approve <i>[Signature]</i></p> <p>Forward for Open Hearing:</p> <p><input checked="" type="checkbox"/> WITHOUT Reservations</p> <p><input type="checkbox"/> WITH Reservations:</p> <p>Comments:</p> <p><u><i>Robert P. Heckerl</i></u> School Committee Chr.</p>
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Step #4 (Academic Dean): Recommended NOT Recommended Conditionally Recommended (See Comments)

Comments:

Dean Signature/Date *[Signature]* 10/20/97

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 2/25/98

Senate Curriculum Committee chair Signature/Date: *[Signature]* 2/25/98

Step #7 (Executive Vice President/Provost): Date Received 2/24/98

Approved

NOT Approved If no, reasons are as follows:

Student Credit Hours _____

Faculty Load Hours _____

Equalized Credit Hours _____

Official Copy & Approval Sheet Filed (Date) 2/24/98

Executive Vice President/Provost Signature C. M. Atkinson

Registrar

Date Approved Course Description Received 2/24/98

Hegis Taxonomy and Course Number Assigned 0908-305

Date/Signature of Registrar S. C. Galt 3/2/98

Notification Forward:

Senate Curriculum Committee Chairperson

Department Chairpersons

Academic Dean(s)

Registrar

Sponsor(s)

Transmitted
3/4/98

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.