

ROWAN COLLEGE
CURRICULUM COMMITTEE

(R)

PROPOSAL TITLE: Structural Engineering I 0908-281

UNDERGRADUATE GRADUATE 3 CREDIT HOURS

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

DEPARTMENT & TELEPHONE# Civil Engineering Program, School of Engineering

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

<p style="text-align: center;">STEP #1 (DEPARTMENT)</p> <p>APPROVED/DATE: <u>4-24-96</u></p> <p>NOT APPROVED/DATE: _____</p> <p style="text-align: center;"><i>[Signature]</i> DEPT. CURRICULUM CHR.</p> <p>REVIEWED/DATE: <u>4-24-96</u></p> <p style="text-align: center;"><i>[Signature]</i> DEPT. CHR.</p>	<p style="text-align: center;">STEP #2 (RECEIPT)</p> <p>SCC# <u>96 97-04</u></p> <p>DATE RECEIVED: _____</p> <p style="text-align: center;">SENATE</p> <p style="text-align: center;">JUL 9</p> <p style="text-align: center;">RECEIVED</p> <p style="text-align: center;"><i>[Signature]</i> SENATE CURRICULUM CHR.</p>	<p style="text-align: center;">STEP #3 (SCHOOL)</p> <p>REVIEWED DATE: <u>4-18-96</u></p> <p><input type="checkbox"/> RECOMMEND TO APPROVE</p> <p><input type="checkbox"/> RECOMMEND NOT TO APPROVE</p> <p style="text-align: center;">FORWARD FOR OPEN HEARING</p> <p><input type="checkbox"/> WITHOUT RESERVATIONS</p> <p><input type="checkbox"/> WITH RESERVATIONS</p> <p>COMMENTS: _____</p> <p style="text-align: center;"><i>[Signature]</i> SCHOOL COMMITTEE CHR.</p>
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<p>STEP #4 (ACADEMIC DEAN)</p> <p><input checked="" type="checkbox"/> RECOMMEND</p> <p><input type="checkbox"/> NOT RECOMMEND</p> <p><input type="checkbox"/> CONDITIONALLY RECOMMEND (SEE COMMENTS)</p> <p>DATE & SIGNATURE, DEAN OF SCHOOL _____</p>	<p>COMMENTS: _____</p> <p style="text-align: center;"><i>[Signature]</i> <u>5/19/96</u></p>
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<p>STEP #5 (SENATE CURRICULUM COMMITTEE)</p> <p>DATE OF OPEN HEARING <u>10-28-96</u></p> <p>APPROVED BY SENATE CURRICULUM COMMITTEE (DATE) <u>10/28/96</u></p> <p><input type="checkbox"/> RETURNED TO SPONSOR(S) FOR THE FOLLOWING REASONS: _____</p> <p>_____</p> <p>_____</p>
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<p>STEP #6 (SENATE)</p> <p>PRESENTED TO SENATE <u>11-20-96</u> <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> NOT APPROVED</p> <p>NOTIFICATION TO EXECUTIVE VICE PRESIDENT/PROVOST (DATE) _____</p> <p>SENATE CURRICULUM COMMITTEE CHAIR SIGNATURE/DATE <u><i>[Signature]</i> 10/28/96</u></p>

STEP #7 (EXECUTIVE VICE PRESIDENT/PROVOST)

DATE RECEIVED _____

APPROVED: ___ YES ___ NO

IF NO, REASONS ARE AS FOLLOWS:

STUDENT CREDIT HOURS 3

FACULTY LOAD HOURS _____

EQUALIZED CREDIT HOURS _____

OFFICIAL COPY & APPROVAL SHEET FILED (DATE) 1/31/97

SIGNATURE, EXECUTIVE VICE PRESIDENT/PROVOST [Signature]

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED 14 Mar 97

HEGIS TAXONOMY AND COURSE NUMBER ASSIGNED 0908.281

DATE/SIGNATURE OF REGISTRAR B. Kelly

NOTIFICATION FORWARD:

___ SENATE CURRICULUM COMMITTEE CHAIRPERSON

___ DEPARTMENT CHAIRPERSON(S)

___ ACADEMIC DEAN(S)

___ REGISTRAR

___ SPONSOR(S)

Course Proposal:

1. Details:

- a) Course Title: Structural Engineering I
- b) Sponsor: Dr. Ralph Alan Dusseau and School of Engineering Curriculum Committee
- c) Credit Hours: 3 credit hours
- d) Course Level: Sophomore (0908.281)
- e) Curricular Effect: Required course for all civil engineering students
- f) Prerequisites: Statics and Solid Mechanics
- g) Suggested Time/
Scale of Implementation: One section during spring semesters
- h) Resources:

Faculty: Existing faculty will teach this course.

Library: Library acquisitions will be required.

Equipment: No laboratory equipment will be required.

Computers: Computer laboratory access will be required. Acquisition, training, and utilization of professional structural engineering analysis and design software will also be required.

2. Rationale:

The proposed course is the revised version of a civil engineering course entitled "Structural Analysis I" which was part of the Engineering Curriculum Proposal approved by the College Senate in December 1994. The proposed course is consistent with the establishment of the School of Engineering approved by the Board of Trustees in February 1995.

The two fundamental themes of the course are the analysis of simple structures and the design of reinforced concrete members. These are the two most-essential structural engineering skills that civil engineers must have. Most civil engineering structures are simple structures (i.e., statically-determinate

structures) and many civil engineering structures (especially those built for environmental engineering projects) are made of reinforced concrete (i.e., concrete with steel reinforcing bars embedded inside). Thus, the two fundamental themes of the proposed course are essential for all civil engineering students.

The proposed course is the only structural engineering course required for civil engineering students who select the Environmental Engineering Option in the Civil Engineering Program. More-advanced topics in structural engineering analysis and design will be covered in the two civil engineering courses entitled "Structural Engineering II and III" which are required for civil engineering majors who select the Infrastructure Engineering Option in the Civil Engineering Program.

3. Essence of the Course:

a) Objectives:

Upon completion of the course, civil engineering students will be able to analyze simple structures by hand calculation and by computer including the following tasks:

Determining the types of simple structures

Determining the types of simple loads

Analyzing various types of statically determinate structures

Deriving influence lines in statically-determinate beams

Calculating deflections of statically-determinate beams

Upon completion of the course, civil engineering students will also be able to design reinforced concrete members by hand calculation and by computer including the following tasks:

Selecting appropriate concrete

Selecting appropriate reinforcing steel

Selecting appropriate reinforced concrete design methods

Calculating the required cross-section dimensions for the following reinforced concrete members:

Rectangular beams

Tee beams

One-way slabs

Calculating the development length of steel reinforcing bars

Designing concrete members to resist shear forces

Calculating the deflection of reinforced concrete members

b) Topical Outline:

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

Analysis of Simple Structures:

Types of Simple Structures

Types of Simple Loads

Analysis of Statically Determinate Structures

Influence Lines in Statically Determinate Beams

Deflection of Statically Determinate Beams

Design of Reinforced Concrete Beams and Slabs:

Types of Concrete

Types of Reinforcing Steel

Methods of Design

Cross-section Design Dimensions for the following
Reinforced Concrete Members:

Rectangular Beams

Tee Beams

One-Way Slabs

Development Length of Steel Reinforcing Bars

Catalog Description:

Structural Engineering I (0908.281)

(Prerequisites: Statics and Solid Mechanics)

The course deals with the analysis of simple structures and the design of reinforced concrete structural members. The study of simple structures includes the analysis of statically determinate structures, influence lines in simple beams, and deflections of simple beams. The design of reinforced concrete structural members includes types of concrete and steel, methods of design, rectangular beams, tee beams, slabs, development length, shear, and deflection. The course includes appropriate computer applications.