

ROWAN COLLEGE  
CURRICULUM COMMITTEE

PROPOSAL TITLE: Structural Engineering III

0908-383

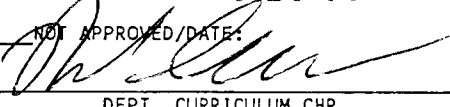



(R)

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

STEP #1 (DEPARTMENT)	STEP #2 (RECEIPT)	STEP #3 (SCHOOL)
APPROVED/DATE: <u>4-24-96</u> NOT APPROVED/DATE: _____  DEPT. CURRICULUM CHR.  REVIEWED/DATE: <u>4-24-96</u>   DEPT. CHR.	SCC# <u>96-97-06</u> DATE RECEIVED: _____ <div style="text-align: center; font-size: 2em; font-weight: bold;">SENATE</div> <div style="text-align: center; font-size: 1.5em; font-weight: bold;">JUL 9</div> <div style="text-align: center; font-size: 1.5em; font-weight: bold;">RECEIVED</div>  SENATE CURRICULUM CHR.	REVIEWED DATE: <u>4-24-96</u> <input checked="" type="checkbox"/> RECOMMEND TO APPROVE <input type="checkbox"/> RECOMMEND NOT TO APPROVE FORWARD FOR OPEN HEARING <input checked="" type="checkbox"/> WITHOUT RESERVATIONS <input type="checkbox"/> WITH RESERVATIONS COMMENTS: _____   SCHOOL COMMITTEE CHR.

STEP #4 (ACADEMIC DEAN)      COMMENTS:

RECOMMEND  
 NOT RECOMMEND  
 CONDITIONALLY RECOMMEND (SEE COMMENTS)

DATE & SIGNATURE, DEAN OF SCHOOL: James D. Hayes 5/19/96

STEP #5 (SENATE CURRICULUM COMMITTEE)

DATE OF OPEN HEARING 10-28-96

APPROVED BY SENATE CURRICULUM COMMITTEE (DATE) 10/28/96

RETURNED TO SPONSOR(S) FOR THE FOLLOWING REASONS:

\_\_\_\_\_

\_\_\_\_\_

STEP #6 (SENATE)

DATE PRESENTED TO SENATE 11-20-96       APPROVED       NOT APPROVED

NOTIFICATION TO EXECUTIVE VICE PRESIDENT/PROVOST (DATE) \_\_\_\_\_

SENATE CURRICULUM COMMITTEE CHAIR SIGNATURE/DATE: Ronald J. Gordon 11/21/96

STEP #7 (EXECUTIVE VICE PRESIDENT/PROVOST)

DATE RECEIVED \_\_\_\_\_

APPROVED:  YES  NO

IF NO, REASONS ARE AS FOLLOWS:

STUDENT CREDIT HOURS \_\_\_\_\_

FACULTY LOAD HOURS \_\_\_\_\_

EQUALIZED CREDIT HOURS \_\_\_\_\_

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

SIGNATURE, EXECUTIVE VICE PRESIDENT/PROVOST *C. M. Hester*

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED 14 Mar 97

HEGIS TAXONOMY AND COURSE NUMBER ASSIGNED 0908-353

DATE/SIGNATURE OF REGISTRAR *B. J. 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 III
- b) Sponsor: Dr. Ralph Alan Dusseau and School of Engineering Curriculum Committee
- c) Credit Hours: 3 credit hours
- d) Course Level: Junior (0908.383)
- e) Curricular Effect: Required course for civil engineering students who choose the infrastructure engineering option and elective course for students who choose the environmental engineering option
- f) Prerequisites: Structural Engineering II
- 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 Design" 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 fundamental theme of the course is the analysis and design of structural frames using reinforced concrete, structural steel, wood, mixed construction, and composite construction. Most buildings are designed using frame construction, i.e. with structural columns providing the vertical support and with structural beams providing the horizontal support. While frames are generally designed using a single structural material, more and more civil engineering structures are being designed using mixed construction (i.e., with two or materials in the same structural frame) and/or using composite construction (i.e., with two materials in the same structural member). Therefore, the ability to design structural frames using any of the structural materials (concrete, steel, or wood) either individually or in combination will be critical for the structural engineer of the future.

The proposed course is required for all civil engineering students who choose the Infrastructure Engineering Option in the Civil Engineering Program and is an elective for students who choose the Environmental Engineering Option.

### 3. Essence of the Course:

#### a) Objectives:

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

Designing frame members (not covered in previous structural engineering courses) which includes the following:

Selecting types of wood and cross-section dimensions for wood beams and columns

Calculating cross-section dimensions for continuous reinforced concrete columns and beams

Calculating steel cross-sections and concrete deck depth for composite steel and concrete beams

Selecting structural steel sections and wood deck type and depth for composite steel and wood beams

Analyzing and designing structural frames which includes the following:

Analyzing and designing wood frames with wood decks

Analyzing and designing concrete frames with concrete decks

Analyzing and designing steel frames with reinforced concrete decks

Analyzing and designing steel frames with wood decks

Analyzing and designing steel frames with composite decks

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:

Design of Miscellaneous Frame Members:

Wood Members:

Cross-Section Dimensions and Type for Beams

Cross-Section Dimensions and Type for Columns

Continuous Reinforced Concrete Members:

Cross-section Dimensions for Continuous Columns

Cross-section Dimensions for Continuous Beams

Composite Steel and Concrete Beams:

Structural Steel Cross-Sections

Concrete Deck Depth

Composite Steel and Wood Beams:

Wood Deck Type and Thickness

Structural Steel Cross-Sections

## Analysis and Design of Structural Frames:

Wood Frames with Wood Decks

Reinforced Concrete Frames with Concrete Decks

Steel Frames with Reinforced Concrete Decks

Steel Frames with Wood Decks

Steel Frames with Composite Concrete or Wood Decks

### c) Evaluation and Grading Procedure of Students:

Student grades will be based on team problems, team projects, 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 the revised version of a course entitled "Structural Design" that was 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.

Catalog Description:

Structural Engineering III (0908.383)

(Prerequisites: Structural Engineering II)

The course deals with the analysis and design of structural frames of uniform, mixed, and composite construction. The design of frame members includes members not covered in previous courses such as wood beams and columns, reinforced concrete columns, continuous reinforced concrete beams, composite steel and concrete beams, and composite steel and wood beams. The analysis of structural frames includes the analysis of wood frames with wood decks, reinforced concrete frames with reinforced concrete decks, and steel frames with various types of decks. The course includes appropriate computer applications.