PROPOSAL SCC #01-02- 411

CURRICULUM PROPOSAL FORM 2001-2002

NON-GENERAL EDUCATION PROCESS A

***DEADLINES: Deadline dates for 2001/2002 submissions: Regular proposals: October 19, 2001 to be implemented in Fall 2002; Short-Term proposals: December 7, 2001 to be implemented in Fall, 2002; Regular proposals February 15, 2002 to be implemented in Spring, 2003; March 22, 2002 for short-term courses to be implemented in Spring 2003.**

PROPOSAL TITLE: Advanced Pavement Analysis and Evaluation

SPONSOR(S): Yusuf Mehta, x 5327

DEPARTMENT: Civil and Environmental Engineering

COLLEGE:

IF LAS CHECK ONE: ___ History/Humanities ___Math/Sciences ___Social/Behavioral Sciences

Check one: ____Undergraduate __X__Graduate

THE ATTACHED ***NON-GEN-ED*** PROPOSAL IS BEST DESCRIBED BY THE ITEM(S) CHECKED.

___X_New non-gen-ed course

____Short-term non-gen-ed course

____Minor curricular changes (fewer than three) to:

____existing non-gen-ed course

_____non-gen-ed degree requirements

_____major

_____ minor, specialization, concentration, track, certificate program

DEPARTMENT

(Signature indicates approval) David D Clay 2/15/02

Dept. Curriculum Chair / Date

-Kirsten Parker 2/15/02

Dept. Chairperson / Date

.CADEMIC DEAN

Approved ✓ Not Approved ___ Comments: No additional resource needs in excess of base budget ~~funding~~ are anticipated.

Dean's Signature/Date Dianne Worland 4/22/02

COLLEGE CURRICULUM COMMITTEE

Date of open hearing (if necessary) 4/26/02 Approved X Not Approved _____

Comments:

Signature of College Chair/Date: [signature]

UNIVERSITY CURRICULUM COMMITTEE

Date Received/Processed _____

Comments:

Curriculum Chair Signature Jeanette Reeves Date Announced At Senate 6/5/02

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): _____ Executive VP/Provost Signature/Date [signature] 11/3/02

REGISTRAR

Date Approved Course Description Received _____ Hegis Taxonomy & Course Number Assigned 0903 363

Registrar Signature/Date [signature] 11/5/02

NOTIFICATION FORWARD

✓ Senate Curriculum Committee Chairperson

✓ Academic Dean(s) Cap Int Rech Im 11/22/02

✓ Department Chairpersons

✓ Registrar

_____ Sponsor(s) ✓

Course Proposal

1. Details

a) Course Title: **Advanced Pavement Analysis and Evaluation**

b) Sponsor: Dr. Yusuf A. Mehta, Civil Engineering, x5327

c) Credit Hours: 3 credit hours

d) Course Level: Graduate, (0908.563)

e) Prerequisites: Transportation Engineering (0908.461) or permission of instructor.

f) Suggested Time: One section during spring semesters, offered alternate years, starting Spring semester, 2003

g) Curricular Effect: Elective course for civil engineering graduate students

h) Resources

Faculty:	Existing faculty can teach this course.
Library:	Library acquisitions will be required.
Equipment:	Existing laboratory facilities and equipment are adequate for this course.
Computers:	Computer laboratory access will be required. Acquisition, training, and utilization of professional pavement materials and design software will also be required.

i) Library Resources: Library acquisitions will be required.

2. Rationale

The proposed course is a new course, derived from an existing course entitled "Advanced Transportation Engineering" (0908-562) which is currently part of the graduate Engineering Curriculum. The existing course will be changed to "Advanced Pavement Analysis and Evaluation," (0908-563), and offered in even-numbered years. This new course will cover in greater depth selected aspects of the existing course, and add new topics.

By splitting the single, existing course that is offered every year into two distinct courses offered in alternate years, the variety of technical electives in Civil and Environmental Engineering is broadened.

3. Essence of the Course

a) Objectives

Upon completion of the course, students will be able to analyze the following phenomenon by field experimentation, computer modeling, and hand calculation:

Response of layered systems
Interaction between load and pavement
Response of discontinuous pavement systems
Material characterization for response and failure
Non-linear behavior
Thermal response
Pavement performance relationships

In addition, upon completion of the course, graduate students will be able to independently investigate additional areas related to the topic, write a technical paper, conduct a seminar on their findings, and develop a design exercise of a quality suitable for use in an undergraduate course.

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 pavement materials and design technology. The topics initially planned include the following:

Overview of Mechanistic Pavement Design
Pavement Distress and Its Causes
Response of Layered Systems
- *Closed form solutions*
- *BISAR*

Interaction between load and pavement
- *Rigid load (Plate tests)-RIGID*
- *FWD Backcalculation-BISDEF*

Measured tire contact stresses
Response of discontinuous pavement systems
- *Effect of stiffness gradient, crack length and load position.*

Material Characterization for Response and Failure
- *Review of classical fatigue*
- *Classical fracture mechanics*
- *Continuum damage mechanics*
- *Crack growth model*

Non linear behavior
- *Source of nonlinearity*
- *Effective layer modulus*
- *ILLIPAVE*

Thermal response

Effect of viscoelastic behavior, contraction coefficient, and rate of cooling

TCMODEL

Pavement performance relationships

c) Evaluation and Grading Procedure of Students:

Student grades will be based on individual and/or group examinations, individual homework, design projects, and lab reports.

d) Course Evaluation:

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

4. Results of Consultations

The proposed course is derived from an existing course entitled "Advanced Transportation Engineering" (0908-562) which is part of the current Engineering Curriculum approved by the University Senate. Consultations were submitted with the original proposal as specified by the Curriculum Committee.

Catalog Description

Pavement Analysis and Evaluation (0908.563)

Prerequisites: Transportation Engineering (0908.461), or permission of instructor.

(Offered odd-numbered years) The fundamental theme of the course is the engineering study of pavement response. The topics covered include non-linear behavior of pavement materials and interaction between tires and pavements. Modeling and analysis of pavement behavior will also be taught, with content varying based upon instructor and student interests. The course includes field experiments and computer applications.

ROWAN UNIVERSITY
Department of Geography and Anthropology

October 29, 2002

Dr. Ralph Dusseau
DRBA Professor and Chair
Department of Civil and Environmental Engineering
Rowan University
Glassboro, NJ 08028

Dear Dr. Dusseau:

As you requested, I am writing to offer my support for five course proposals written by professor Mehta of your department. I have carefully reviewed the proposals for the following courses:

1. Transportation Engineering [0908-361]
2. Design Elements of Transportation Engineering [0908-564]
3. Pavement Analysis and Evaluation
4. Advanced Pavement Analysis and Evaluation
5. Surveying and Engineering Graphics [0908-203]

Considered individually, each of the course proposals is complete, logical, and well thought out. Taken together, the proposals would seem to provide undergraduate and graduate students with a comprehensive overview of many of the issues relevant to transportation systems. I am especially impressed by the way in which the proposals dovetail with one another, thereby providing students with a complete tapestry of related material relevant to the topics covered.

A frequent concern of curriculum committees is the question of whether or not proposals for new courses in one department overlap inappropriately with those offered by another department. In this set of courses, I see no significant overlap with courses offered by our department. Even though we do offer a course in transportation geography, that course has very little in common with those proposed here. Specifically, the only area in which there might be overlap is with the course, Design of Elements of Transportation Engineering, where there is some treatment of traffic generation and demand forecasting, a topic treated, to some degree, in our geography of transportation course. Inasmuch as this course is at the graduate level, this overlap in material treated is no concern to me. Moreover, I am very strongly opposed to the notion that there can be no overlap among or between disciplines.

Additionally, I believe that some of the courses might be of interest to students in departments other than yours. For instance, majors in our department who have an interest in planning could certainly benefit from Transportation Engineering [0908-361] and Surveying and Engineering Graphics [0908-203].

After careful review of these proposals, I can give my strong support to all of them and urge the curriculum committee to vote their approval.

Sincerely yours,

RICHARD A. SCOTT, Ph.D.
Professor of Geography