

# ROWAN UNIVERSITY CURRICULUM PROPOSAL

911

**PROPOSAL TITLE**  
 Creation of a Graduate Specialization: Environmental Engineering

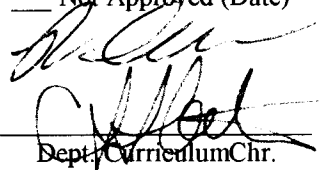
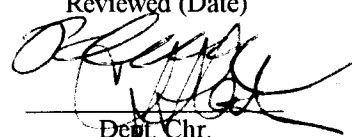

**CHECK APPROPRIATE:**     UNDERGRADUATE     GRADUATE     SEMESTER HOURS

**SPONSOR(S):** Dr. R. Dusseau and Dr. C.S. Slater

**DEPARTMENT/TELEPHONE #** Dr Dusseau: Civil Engineering/256-4628    Dr C.S. Slater/256-4361


**CHECK ONE:**     COURSE     MINOR PROGRAM     CONCENTRATION     SPECIALIZATION

ACHIEVEMENT CERTIFICATE     CERTIFICATION PROGRAM     MAJOR PROGRAM

<p><b>Step #1 (Department)</b></p> <p><input checked="" type="checkbox"/> Approved (Date) <u>10-28-97</u></p> <p><input type="checkbox"/> Not Approved (Date)</p> <p>                  Dept. Curriculum Chr.</p> <p><u>10-28-97</u>                  Reviewed (Date)</p> <p>                  Dept. Chr.</p>	<p><b>Step #2 (Receipt)</b></p> <p>SCC# <u>97-98-169</u></p> <p><u>10-24-97</u>                  Date Received Senate</p> <p>_____                  Senate Curriculum Chr.</p>	<p><b>Step #3 (School)</b></p> <p>Reviewed Date: <u>10/24/97</u></p> <p><input checked="" type="checkbox"/> Recommend to Approved</p> <p><input type="checkbox"/> Recommend NOT to Approve</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>                  School Committee Chr.</p>
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**Step #4 (Academic Dean):**     Recommended     NOT Recommended     Conditionally Recommended (See Comments)

Comments:


Dean Signature/Date:  10/28/97

**Step #5 (Senate Curriculum Committee)**    Open Hearing Date: 5-11-98    Approved by Curriculum Committee Date \_\_\_\_\_

Returned to Sponsor(s) for the following reason:

**# 6 (Senate)**    Date announced/voted on at Senate 5/12/98    If voted on:     Approved     NOT Approved

Date forwarded to Executive Vice President/Provost 10/1/97

Senate Curriculum Committee chair Signature/Date: 



## **Creation of a Graduate Specialization: Environmental Engineering**

### **1. Narrative**

- a. Title and Sponsor: Specialization in Environmental Engineering for the Degree of Master of Science in Engineering - R. Dusseau & S. Slater
- b. Need for the Program: There is a need to provide a graduate education which focuses on the needs of the graduate students in environmental engineering.
- c. Relationship to Dept. And School: This specialization will be jointly administered by the Department of Civil Engineering and the Department of Chemical Engineering.
- d. Summary of curriculum: The curriculum is provided in the graduate catalog for the Master of Science in Engineering.
- e. Implementation time frame: Effective Fall Semester 1998
- f. Resources required: No additional resources are required.

### **2. Details**

- a. Title: Formation of a Specialization in Environmental Engineering for the degree of Master of Science in Engineering.
- b. Sponsor: R. Dusseau and C.S. Slater
- c. Scope: This specialization will serve those students who wish to focus their studies in the area of environmental engineering.
- d. Relationship to Curriculum: The program requirements are the same as those for the Master of Science in Engineering except for the specification of the technical electives as given in Section 4c of this proposal.
- e. Prerequisites: The admissions requirements are the same as for the Master of Science in Engineering program, as provided in the College Catalog.

- f. Suggested time scale  
for implementation: Full scale implementation in Fall1998.
- g. Resource Requirement: There are no additional resources required.
- h. Recommended Library  
Resources: There are no additional library resources required.

### **3. Rationale**

As the College of Engineering grows, it will be providing highly specialized graduate courses within its discipline. In concert, there is a need for graduate students to obtain recognition of their expertise in the area. This specialization will address both of these observations.

### **4. Essence of the Specialization**

- a. Major Goal: The major goal of the program is to enhance the ability of environmental engineers and others who are working in the area of environmental engineering.
- b. Objectives: The objectives of the program are to provide courses in the area of environmental engineering, to enhance the professional development of those who are working in the area of environmental engineering, and to provide means to specialize in an area of study.
- c. Structure: Out of 21 credits in the technical area, 15 credits in Environmental Engineering technical courses will qualify for specialization in Environmental Engineering.
- d. Administration: Each department will provide guidance to the student and coordinate the activity with the graduate advisor.

### **5. Results of**

**Consultation:** The Dean (J. Tracey), Associate Dean (S. Chin) and Department Chairs of the other engineering programs (T.R. Chandrupatla, and J. Schmalzel) were all consulted and concurred with forming a specialization in Environmental Engineering.

## CREATION OF SPECIALIZATIONS IN MASTER OF SCIENCE IN ENGINEERING

Total: 30 credits

**Common Core:** 6 to 9 S.H.

One math course: Engineering Applications of Analysis (3)

Computer application: May be satisfied by a technical course

One business course (3)

The core requirements remain unchanged.

### **MS in Engineering with Specialization**

Of the remaining 21 to 24 credits, 15 Credits in the area of Specialization as listed below will qualify for specialization in that area. Five areas of specialization are given below.

#### Chemical Engineering

- Courses: 906.502 Special Topics in Chemical Engineering  
906.506 Process Heat Transfer  
906.508 Membrane Process Technology  
906.510 Biochemical Engineering  
906.512 Safety in the Process Industries  
906.514 Transport Phenomena for Engineers  
906.515 Advanced Reactor Design  
906.516 Advanced Separation Process Technology  
906.518 Polymer Engineering  
906.520 Environmental Design for Process Industries  
906.5xx Graduate courses in Chemical Engineering to be introduced
- 901.503 Engineering Optimization

#### Civil Engineering

- Courses: 908.503 Special Topics in Civil Engineering  
908.504 Engineering Estimating  
908.552 Foundation Engineering  
908.553 Earth Retaining Systems  
908.562 Advanced Transportation Engineering  
908.573 Advanced Structural Analysis  
908.584 Prestressed Concrete  
908.585 Advanced Reinforced Concrete  
908.586 Bridge Engineering  
908.5xx Graduate courses in Civil Engineering to be introduced  
Upto three courses from Environmental Engineering 908.5xx below
- 901.502 Finite Element Analysis  
901.503 Engineering Optimization

### Environmental Engineering

Courses: 908.512 Physicochemical Unit Processes  
908.522 Advanced Wastewater Treatment  
908.532 Groundwater and Soil Remediation  
908.543 Advanced Water Resources Engineering  
908.5xx Graduate courses in Environmental Eng. to be introduced

906.502 Special Topics in Chemical Engineering  
906.506 Process Heat Transfer  
906.508 Membrane Process Technology  
906.512 Safety in Process Industries  
906.516 Advanced Separation Process Technology  
906.520 Environmental Design in Industry

910.511 Combustion  
901.502 Finite Element Analysis  
901.503 Engineering Optimization

### Electrical Engineering

Courses: 909.504 Special Topics in Electrical Engineering  
909.551 Digital Signal Processing  
909.552 Digital Image Processing  
909.553 Digital Speech Processing  
909.560 Artificial Neural Networks  
909.571 Instrumentation  
909.5xx Graduate courses in Electrical Engineering to be introduced

901.503 Engineering Optimization

### Mechanical Engineering

Courses: 910.501 Computer Integrated Manufacturing and Automation  
910.505 Special Topics in Mechanical Engineering  
910.511 Combustion  
910.512 Rocket Propulsion  
910.541 Advanced Mechanism Design  
910.5xx Graduate courses in Mechanical Engineering to be introduced

901.502 Finite Element Analysis  
901.503 Engineering Optimization

The credits for the Thesis/Project can be used toward specialization if the principal area of the thesis is in that speciality.

Remaining 6 to 9 credits may be across the disciplines.

**MS in Engineering (no specialization)**

This option is available for those who plan to take courses across disciplines.

21-24 credits of Technical Electives.

Each degree candidate is expected to closely coordinate his/her program of study with a faculty advisor.