ROWAN UNIVERSITY CURRICULUM PROPOSAL

PROPOSAL TITLE: DIGITAL I

CHECK APPROPRIATE: ✓ UNDERGRADUATE  ___ GRADUATE  2 SEMESTER HOURS

SPONSOR(S): J. SCHMUTZEL

DEPARTMENT/TELEPHONE #:  *4629

CHECK ONE: ✓ COURSE  ___ MINOR PROGRAM  ___ CONCENTRATION  ___ SPECIALIZATION

___ ACHIEVEMENT CERTIFICATE  ___ CERTIFICATION PROGRAM  ___ MAJOR PROGRAM

Step #1 (Department)

2206/97 Approved (Date)

___ Not Approved (Date)

Dept. Curriculum Chr.

Step #2 (Receipt)

SCC# 97-98-184

10-24-97 Date Received Senate

Dept. Chr.

Senate Curriculum Chr.

Step #3 (School)

Reviewed Date: 22 OCT 97

✓ Recommend to Approved

___ Recommend NOT to Approve

Forward for Open Hearing:

✓ WITHOUT Reservations

___ WITH Reservations:

Comments:

School Committee Chr.

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: 11/19/97 Approved by Curriculum Committee Date 1/14/97

Returned to Sponsor(s) for the following reason:

Step #6 (Senate) Date announced/voted on at Senate 1/29/98 If voted on: ___ Approved  ___ NOT Approved

Date forwarded to Executive Vice President/Provost:

Senate Curriculum Committee chair Signature/Date: 1/27/98
Step #7 (Executive Vice President/Provost): Date Received 2-8-98

_ Approved

_ NOT Approved If no, reasons are as follows:

Student Credit Hours ______

Faculty Load Hours ______

Creditized Credit Hours ______

Official Copy & Approval Sheet Filed (Date) ____________________________

Executive Vice President/Provost Signature ____________________________

Registrar

Date Approved Course Description Received 2-4-98

Regis Taxonomy and Course Number Assigned 6904-241

Date/Signature of Registrar 2-9-98

Notification Forward:

_____ Senate Curriculum Committee Chairperson

_____ Department Chairpersons

_____ Academic Dean(s)

_____ Registrar

_____ Sponsor(s)
Course Proposal

1. Details:
   a) Course Title: Digital I (0909.241)
   b) Sponsor: Dr. John L. Schmalzel, Electrical Engineering and Electrical Engineering Curriculum Committee
   c) Credit Hours: 2 credit hours
   d) Course Level: Sophomore
   e) Curricular Effect: Required course for electrical engineering majors
   f) Prerequisites: Network I and Computer Science & Programming or permission of instructor
   g) Suggested Time/Scale of Implementation: Spring 1998
   h) Resources: One section
      Faculty will be hired and laboratory equipment obtained consistent with College of
      Engineering multi-year budget. Library acquisitions will be required.

2. Rationale:

   The proposed course is a revision to 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.

   A foundation element of modern electrical engineering (EE) is digital systems theory.
   This underpins a substantial portion of the total technology that is dependent on bi-logic digital
   and computer systems. Students must gain a working knowledge of boolean algebra and its
   application to switching theory, asynchronous networks, and synchronous networks. In addition,
   technology details are an essential component of this understanding as the speed-power products
   available in the marketplace are determined by implementation.

3. Essence of the Course:

   a) Objectives:

      The proposed course has a number of objectives:

      (i) Provide an overview of the basics of digital system design.
(ii) Provide a working knowledge of boolean algebra, switching theory, and techniques for minimization.

(iii) Provide a working knowledge of fundamental logic circuits and networks including asynchronous and synchronous networks.

(iv) Introduce principles of fault tolerance.

(v) Develop the ability to design, simulate, and implement logic networks using some combination of logic elements, programmable logic arrays & devices in a simulation and development environment.

b) Topical Outline:

- Foundation mathematics: number systems, base conversions, arithmetic operations; fixed-point and floating-point math; coding, Boolean algebra.

- Logic technologies: bipolar and CMOS technologies; speed-power product; AC and DC performance characteristics.

- Logic simulation: design capture, test vectors, simulation. Hardware descriptor languages (HDL).

- Combinational networks: Network analysis; network synthesis; minimization techniques; SSI-, MSI-, and LSI-design; PLA, PLD, and FPGA design. VLSI design.

- Sequential networks: Network analysis; network synthesis; SSI-, MSI-, and LSI-design.

- Applications: Sequencers, registers, state machines.

c) Evaluation and Grading Procedures:

Student grades will be based on projects, examinations, homework, and written and oral technical communication.

d) Course Evaluation:

The proposed course will be evaluated based on student evaluations and critical review by engineering faculty.

e) Texts:


4. Results of Consultations:

a) Consulted Departments: Computer Science

b) Consultants and Consultant Statements: (See attached.)

c) Written Consultations: (See attached.)

5. Additional Supporting Information: N/A
6. Catalog Description:

The first course in digital systems covers boolean algebra, switching theory, minimization, asynchronous and synchronous network design, and hardware design using state equations in a simulation and development environment. The course also treats applications of digital system design.

Prerequisite of Network I and Computer Science and Programming required or permission of instructor.