ROWAN UNIVERSITY CURRICULUM PROPOSAL

PROPOSAL TITLE: DIGITAL I CEEG. 241

CHECK APPROPRIATE: ✓ UNDERGRADUATE ___ GRADUATE 2 SEMESTER HOURS

SPONSOR(S): J. SCHMALZEL

DEPARTMENT/TELEPHONE # x4629

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

___ ACHIEVEMENT CERTIFICATE ___ CERTIFICATION PROGRAM ___ MAJOR PROGRAM

Step #1 (Department)

22OCT97 Approved (Date)

___ Not Approved (Date)

Dept. Curriculum Chr.

22 OCT 97 Reviewed (Date)

Dept. Chr.

Step #2 (Receipt)

SCC# 97-98-184

10-24-97 Date Received Senate

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:

Robert T. Howell

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 11/19/97

Returned to Sponsor(s) for the following reason:

Step #6 (Senate) Date announced/voted on at Senate 1/27/98 If voted on: ___ Approved ___ NOT Approved

Date forwarded to Executive Vice President/Provost _____

Senate Curriculum Committee chair Signature/Date: 1/27/98

tep #7 (Executive Vice President/Provost): Date Received JAN 2 8 1998

\ Approved

__ NOT Approved If no, reasons are as follows:

udent Credit Hours _____

aculty Load Hours _____

qualized Credit Hours _____

icial Copy & Approval Sheet Filed (Date) _____

xecutive Vice President/Provost Signature C O Mottes

egistrar

ate Approved Course Description Received 2-4-98

egis Taxonomy and Course Number Assigned 0504.241

ate/Signature of Registrar BJ Kelley 2-9-98

otification 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 One section
h) Resources	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:

E. Karalis, *Digital Design Principles and Computer Architecture*. Prentice-Hall: New Jersey, 1997.

M.M. Mano, C.R. Kime, *Logic and Computer Design Fundamentals*. Prentice-Hall: New Jersey, 1997.

G. Langholz, A. Kandel, and J.L. Mott, *Digital Logic Design*. Wm. C. Brown: Dubuque, Iowa, 1988.

F.J. Hill and G.R. Peterson, *Digital Logic and Microprocessors*. J. Wiley & Sons: New York, 1984.

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.