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Approval Form

Proposal Title: Principles of Digital Computers

Sponsor(s) Jianning Xu Dept.: Computer Science Ext. 5038

Check one: ~~XXXXX~~ Course Specialization Concentration Minor Achievement Certificate
 Certification Program Major Program Minor Change (please name deletion or credit/title/catalog change)

Undergraduate Graduate Credit Hours

<p>Step 1 (Department)</p> <p><input checked="" type="checkbox"/> Approved <u>1/21/93</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>A. Michael Benner</u> Dept. CC Chairperson</p> <p><input checked="" type="checkbox"/> Reviewed <u>2/1/93</u> Date</p> <p><u>D. C. Smith</u> Dept. Chairperson</p>	<p>Step 2 (Receipt)</p> <p><input checked="" type="checkbox"/> SCC# <u>9.843.0.1</u></p> <p>Proposal Received _____ Date</p> <p><u>Mary J. Petron</u> SCC Chairperson</p>	<p>Step 3 (School CC)</p> <p>Reviewed <u>4-28-93</u></p> <p><input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not Approved</p> <p>Comments:</p> <p><u>J. Caldwell</u> School Curr Comm Chairperson</p>
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Step 4 (Academic Dean) **Comments:**

Recommend
 Not Recommend
 Conditionally Recommend (see comments)

Reviewed _____
Date

Signature, Dean of School

Step 5 (SCC)

Open Hearing 11/2/94 Approved by Senate Curriculum Committee 11/2/94
Date Date

Returned to sponsor(s) for the following reasons:

Step 6 (Senate)

Presented to Senate 11/2/94 Approved Not Approved
Date

Notification to Executive Vice-President/Provost _____
Date

Mary J. Petron
Signature SCC Chairperson

Step 7 (Executive V.P./Provost)

Received 12/9/94
Date

Approved: Yes No

If no, reasons are as follows:

Student credit hours 24

Faculty load hours 24

Equalized credit hours _____

Official copy and approval sheet filed 12/9/94
Date

Donald L. Copeland
Signature, Executive Vice President/Provost

Registrar

Approved course description received 7 Dec 94
Date

Hegis Taxonomy and Course Number assigned 0706-310

B. J. Kelly
Signature, Registrar

7 Dec 94
Date

Notification forwarded:

- Senate Curriculum Committee Chairperson
- Department Chairperson(s)
- Academic Dean(s)
- Registrar
- Sponsor(s)

**Rowan College of New Jersey
Department of Computer Science**

Course Proposal

Principles of Digital Computers

0706-310

1. Details

- a. Course Title: Principles of Digital Computers
- b. Sponsor: Jianning Xu, Computer Science Department
- c. Credit Hours: 4
- d. Course Level: Sophomore/Junior
- e. Curricular Effect: Major requirement
- f. Prerequisites: Computer Organization (0706.2##) and Discrete Mathematics (1703.150)
- g. Suggested Time: One or two sections each semester.
- h. Resources: Faculty and lab facilities are adequate.

2. Rationale

This course is intended to replace Digital Design and Lab as a required course for computer science majors. Although the current Digital Design and Lab course lays necessary foundations for the understanding of computer hardware structure and functions, the amount of time devoted to the topics of digital circuit design is excessive. It is rare that a computer science program within a liberal arts and sciences setting requires a 4 s.h. course devoted virtually exclusively to the topics of digital systems. The proposed course will combine principles of digital design and principles of computer hardware design into one single course. The new course will reduce the coverage on general digital circuit design and include the coverage on computer architecture and design principles of computer hardware components. This course will also have a 1 s.h. laboratory component.

A proposal will be submitted to delete Digital Design and Lab from the catalog as soon as this proposal is approved. Students who are under the current program and have not taken Digital Design and Lab will be asked to take Principles of Digital Computers.

3. Essence of the course

- a. Objective in relation to students outcome

Students will learn principles of digital system design: digital logic, combinational circuits, and sequential circuits. They will also learn principles of computer hardware design: memory system structure, bus and interconnection structure, implementation of arithmetic operations, I/O system structure, hardwired control unit, and microprogrammed control unit. They will also learn about alternative computer architectures.

b. Topic outline

Boolean Algebra
Combinational circuits
Sequential circuits
Memory and storage
Computer interconnection structure
ALU design
Control unit design
I/O system structure
Alternative computer architecture

c. Evaluation and grading procedure of students

Students will be evaluated based on homework, laboratory assignments, one or more in-term examinations, and a final examination.

d. Course evaluation

This course will be evaluated as part of the curriculum review for our next departmental Self-Study scheduled for 1996-97.

4. Results of consultation

This proposal is part of the effort to revise computer science curriculum, as recommended by the Computer Science Self-Study conducted in the Spring of 1992. (See page 43 of the Self-Study Report.) Dr. John Beidler of University of Scranton, consultant for the Self-Study, made following comments on the proposed changes to the hardware oriented courses, including this one: "This restructuring is a must. It will help balance the coverage of the core component of your new curriculum." (See page 5 of Dr. Beidler's report.) No students from other majors are required to take this or Digital Design and Lab course.

5. Additional Information

Catalog Description of Digital Design and Lab (to be replaced):

0706.370 Digital Design and Lab 4 s.h.

(Prerequisites: 0704.204 Assembly Language and 1703.150 Discrete Mathematics)

This course provides an introduction to the logical structure of digital computers. The topics include switching algebra, combinational and sequential circuits, the implementation of arithmetic operations, the control unit, microprogramming, buses, memory and addressing, interface design and microprocessors.

6. Catalog description

Proposed Title, Number, and Catalog Description:

0706.3## Principles of Digital Computers 4 s.h.

(Prerequisites: 0706.2## Computer Organization and 1703.150 Discrete Mathematics)

This course provides an introduction to the fundamentals of computer hardware systems. The topics include digital logic, combinational circuits, sequential circuits, memory system structure, bus and interconnection structure, computer arithmetic and the ALU unit, I/O system structure, hardwired control unit, microprogrammed control unit, and alternative computer architectures. This course is not open to students who have taken 0706.370 Digital Design and Lab.