

Glassboro State College Senate Curriculum Committee

Approval Form

(Handwritten mark)

Proposal Title: Advanced Computer Architecture

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

Check one: ~~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>1/27/93</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>A. Michael</u> Dept. CC Chairperson</p> <p><input checked="" type="checkbox"/> Reviewed <u>1/27/93</u> Date</p> <p><u>Don C. Stone</u> Dept. Chairperson</p>	<p>Step 2 (Receipt)</p> <p><input checked="" type="checkbox"/> SCC# <u>92929</u></p> <p>Proposal Received _____ Date</p> <p><u>Mary J. Palmer</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)

Recommend
 Not Recommend
 Conditionally Recommend (see comments)

Reviewed _____
Date

Comments:

[Signature]
Signature, Dean of School

Step 5 (SCC)

Open Hearing 11/17/92 Approved by Senate Curriculum Committee 1/27/93
Date Date

Returned to sponsor(s) for the following reasons:

Step 6 (Senate)

Presented to Senate 1/22/93
Date

Approved Not Approved

Notification to Executive Vice-President/Provost _____
Date

[Signature]
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 3

Faculty load hours 3

Equalized credit hours _____

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

[Signature]
Signature, Executive Vice-President/Provost

Registrar

Approved course description received 7 Dec. 94
Date

Hegis Taxonomy and Course Number assigned B706-412-

[Signature]
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

Advanced Computer Architecture

05.26.412

1. Details

- a. Course Title: Advanced Computer Architecture
- b. Sponsor: Jianning Xu, Computer Science Department
- c. Credit Hours: 3
- d. Course Level: Junior/Senior
- e. Curricular Effect: Restricted elective for Computer Science Majors
- f. Prerequisites: Principles of Digital Computers (0706.3##)
- g. Suggested Time: One or two sections each year
- h. Resources: Faculty and lab facilities are adequate.

2. Rationale

This course is intended to replace Computer Architecture and change it into a restricted elective course for Computer Science Majors. This change is related to the proposed changes to the two preceding courses of Computer Architecture: Assembly Language Programming and Digital Design and Lab. Under the proposed changes to those two courses, much of the basic materials currently covered in the Computer Architecture course will be incorporated into two modified courses: Computer Organization and Principles of Digital Computers. Therefore, there will be more room for more advanced materials to be covered in this course, and it will also allow more in-depth study of certain architectural topics that interest both students and the instructor. Consequently, we feel that it would be more appropriate to offer this course as a junior/senior level elective topics course. Making this course a restricted elective would also allow the Computer Science Department to introduce new courses to strengthen the weak areas in its current program.

A proposal will be submitted to delete Computer Architecture from the catalog as soon as this proposal is approved. Students who are under the current program and have not taken Computer Architecture will be asked to take Advanced Computer Architecture.

3. Essence of the course

- a. Objectives in relation to student outcome

Students will be exposed to different advanced architectural features of modern computers. They will learn various performance enhancement techniques such as DMA, I/O processor, cache memory, multi-port memories, RISC, pipelining, and superscalar processors. Students will also learn various advanced architectures such as high-level

language architecture, data-flow architecture, and multiprocessor and multicomputer architecture.

b. Topic outline

Memory system enhancement:

Banking, Interleaving, Multiport memories, and cache memory.

I/O system enhancement:

DMA and I/O processor.

Processing unit enhancement:

Pipelining, RISC processors, and Superscalar processors.

Advanced architecture:

High-level-language architecture, data-flow architecture, and multiprocessor and multicomputer architecture.

Detailed examination of one or two contemporary computers.

c. Evaluation and grading procedure of students

Students will be evaluated based on homework, programming 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 Computer Architecture course.

5. Additional Information

Catalog Description of Computer Architecture (to be replaced):

0706.380 Computer Architecture 3 s.h.

(Prerequisites: 0704.240 Assembly Language Programming and 0706.370 Digital Design and Lab)

This course bridges the gap between hardware and software. The topics include microprogramming, the machine language instruction sets and formats of microcomputers, minicomputers and mainframes, assembly language, operating systems, and computer communications.

6. Catalog Description

0706.4## Advanced Computer Architecture 3 s.h.

(Prerequisites: 0706.3## Principles of Digital Computers)

This is an advanced course in computer architecture designed to expand the knowledge gained by students in the Principles of Digital Computers course. The topics include various performance enhancement techniques such as DMA, I/O processor, cache memory, multiport memories, RISC, pipelining, and various advanced architectures such as high-level language architecture, data-flow architecture, and multiprocessor and multicomputer architectures. This course also allows detailed examination of one or two contemporary computers. This course is not open to students who have taken 0706.380 Computer Architecture.