

# ROWAN UNIVERSITY CURRICULUM PROPOSAL

(2)

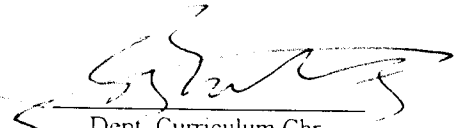
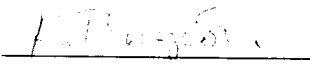
**PROPOSAL TITLE:**  
System Programming and Operating System Internals

**CHECK APPROPRIATE:**  UNDERGRADUATE     GRADUATE    3 SEMESTER HOURS

**SPONSOR(S):**  
Jianning Xu

**DEPARTMENT/TELEPHONE #** Computer Science / 3884

**CHECK ONE:**  COURSE     MINOR PROGRAM     CONCENTRATION     SPECIALIZATION  
 ACHIEVEMENT CERTIFICATE     CERTIFICATION PROGRAM     MAJOR PROGRAM

Step #1 (Department)	Step #2 (Receipt)	Step #3 (School)
<input checked="" type="checkbox"/> Approved (Date) <u>10/24/97</u> <input type="checkbox"/> Not Approved (Date)  Dept. Curriculum Chr.  <u>10/24/97</u> Reviewed (Date)  <u>Dept. Chr.</u> Dept. Chr.	SCC# <u>97-98-96</u>  <u>10-24-97</u> Date Received Senate  Senate Curriculum Chr.	Reviewed Date: <u>11/7/97</u> <input checked="" type="checkbox"/> Recommend to Approved <input type="checkbox"/> Recommend NOT to Approve Forward for Open Hearing: <input checked="" type="checkbox"/> WITHOUT Reservations <input type="checkbox"/> WITH Reservations: Comments:   School Committee Chr.

**Step #4 (Academic Dean):**  Recommended     NOT Recommended     Conditionally Recommended (See Comments)

Comments:

Dean Signature/Date: [Signature] 10/24/97

**Step #5 (Senate Curriculum Committee):** Open Hearing Date 2/20/98 Approved by Curriculum Committee Date \_\_\_\_\_

Returned to Sponsor(s) for the following reason:

**Step #6 (Senate)** Date announced/voted on at Senate 2/24/98 Voted on  Approved     NOT Approved

Be forwarded to Executive Vice President/Provost \_\_\_\_\_

Senate Curriculum Committee chair Signature/Date: [Signature] 2/25/98

Step #7 (Executive Vice President/Provost): Date Received 3/19/98

Approved

NOT Approved If no, reasons are as follows:

Student Credit Hours 2

Faculty Load Hours 2

Equalized Credit Hours \_\_\_\_\_

Official Copy & Approval Sheet Filed (Date) 2/26/98

Executive Vice President/Provost Signature C. M. Atkeson

#### Registrar

Date Approved Course Description Received \_\_\_\_\_

Hegis Taxonomy and Course Number Assigned 0704-392

Date/Signature of Registrar E. C. G. [Signature] 3/2/98

#### Notification Forward:

Senate Curriculum Committee Chairperson

Department Chairpersons

Academic Dean(s)

Registrar

Sponsor(s)

**Rowan University**  
**Department of Computer Science**

**Course Proposal**

**System Programming and Operating System Internals**

1. Details

- a. Course Title: System Programming and Operating System Internals
- b. Sponsor: Jianning Xu, Computer Science Department
- c. Credit Hours: 3
- d. Course Level: Junior/Senior
- e. Curricular Effect: Major restricted elective
- f. Prerequisites: Operating Systems (0704.390) and  
Computer Lab. Techniques (0701.205)
- g. Suggested Time: One section each year.
- h. Resources: Faculty and lab facilities are adequate.

2. Rationale

This course covers the internal structures and algorithms of the system kernel of a modern operating system as well as the system call interface to the kernel. Currently in the Computer Science program, we have a required course titled Operating Systems that addresses the concepts of operating system design and functions. This new course will be offered as a restricted elective that will provide students with reinforcement of basic operating system concepts, concrete examples of actual system structures and design, and the useful experiences of system level programming which deals with such important concepts as interprocess communications, concurrency, and multithreading. This course can help students better understand the relationships between user programs, system software, and machine hardware.

3. Essence of the course

a. Objectives in relation to student outcomes

Student will learn the basic system structures and functions of a modern operating system. They will be exposed to the major functional components of the system kernel and the algorithms and data structures used in the implementations of these components. Students will gain hand-on experience in system level programming in a modern operating system environment. They will learn how to use various system calls for basic file operations, I/O operations, and process control operations. The emphasis will be on interprocess communications and concurrency.

b. Topic outline

- Introduction to kernel
- The file structure and implementation
- System calls for the file system
- The process structure and process scheduling
- System calls for process control
- Memory management policies
- The I/O subsystem
- Primitive interprocess communication
- Advanced interprocess communication

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 by the department curriculum committee.

4. Results of consultation

The consultation is internal to the Computer Science Department.

5. Catalog Description:

0704.3## System Programming and Operating System Internals 3 s.h.

(Prerequisites: 0704.390 Operating Systems and 0701.205 Computer Lab.

Techniques )

This course examines the system kernel of a modern operating system including the file structure and implementation, the process structure and process scheduling, memory management policies, and the I/O subsystem. This course also covers the system call interface to the system kernel and various interprocess communication schemes.