

CURRICULUM PROPOSAL FORM 2000-2001

NON-GENERAL EDUCATION PROCESS A

515
0706 420

*DEADLINES: Deadline dates for 2000/2001 submissions: Regular proposals: October 20, 2000 to be implemented in Fall 2001; Short-Term proposals: December 8, 2000 to be implemented in Fall, 2001; Regular proposals February 16, 2001 to be implemented in Spring, 2002; March 23, 2000 for short-term courses to be implemented in Spring 2002.

PROPOSAL TITLE: Embedded Systems Programming

SPONSOR(S): Ganesh Baliga, Computer Science Dept.

DEPARTMENT: Computer Science Dept.

COLLEGE: LAS

IF LAS CHECK ONE: History/Humanities Math/Sciences Social/Behavioral Sciences

Check one: Undergraduate Graduate

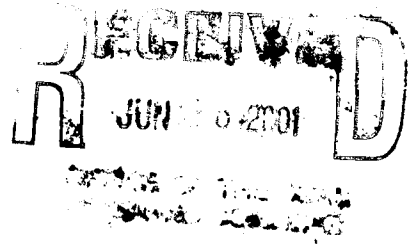
THE ATTACHED **NON-GEN-ED** PROPOSAL IS BEST DESCRIBED BY THE ITEM(S) CHECKED.

New non-gen-ed course

Short-term non-gen-ed course

Minor curricular changes (fewer than three) to:

- existing non-gen-ed course
- non-gen-ed degree requirements
- major
- minor, specialization, concentration, track, certificate program



DEPARTMENT (Signature indicates approval) *[Signature]* (For Jennifer Kay)

Dept. Curriculum Chair / Date

Dept. Chairperson / Date *[Signature]* 6/7/01

ACADEMIC DEAN

Approved Not Approved Comments:

Dean's Signature/Date *[Signature]*

COLLEGE CURRICULUM COMMITTEE

Date of open hearing (if necessary) 11/18/99 Approved Not Approved _____

Comments:

Signature of College Chair/Date: _____

UNIVERSITY CURRICULUM COMMITTEE

Date Received/Processed _____

Comments:

Curriculum Chair Signature Maureen M. Reeves Date Announced At Senate 12-7-99

EXECUTIVE VICE PRESIDENT/PROVOST

Approved Not Approved _____ If no, reasons are as follows:

Student Credit Hours _____ Faculty Load Hours _____ Equalized Credit Hours _____

Official Copy & Approval Sheet Filed (Date): _____ Executive VP/Provost Signature/Date _____

OFFICE OF THE PROVOST

OCT 17 2001

Robert Gale - Provost
ROWAN UNIVERSITY

11/30/01

REGISTRAR

Date Approved Course Description Received _____ Hegis Taxonomy & Course Number Assigned 0766 ^{SIS} ~~700~~

Registrar Signature/Date E.C. Ely 12/5/01

NOTIFICATION FORWARD

Senate Curriculum Committee Chairperson

Academic Dean(s)

Department Chairpersons

Registrar

senate
____ Sponsor(s) _____

12/18/01

✓

**Rowan University
Department of Computer Science**

Course Proposal

Embedded Systems Programming

1. Details

A. Course Title	Embedded Systems Programming
B. Sponsor	Ganesh R. Baliga, Department of Computer Science.
C. Credit Hours	3
D. Course Level	Graduate
E. Curricular Effect	Restricted elective (Advanced Computer Science course) for computer science majors
F. Prerequisites	Operating Systems (0704.390)
G. Suggested Time	One section per year
H. Resources	Faculty, advanced lab facilities and library resources are adequate

2. Rationale

Nowadays embedded software is used in almost every electronic device, such as the digital watches, toaster ovens and security systems. The use of embedded software will proliferate to an even larger degree over the next decade. This course deals with the software issues that arise in the context of embedded systems programming. Since each embedded system is unique, this course will focus on the most common issues that an embedded systems programmer needs to be aware of. These issues include the complexities of device driver programming, multi-tasking, task synchronization with real-time constraints, and, development tools such as emulators, simulators and debuggers.

3. Essence of the course

a) Objectives in relation to student outcome

Students will

- Be able to study a newly designed embedded system and understand its programming interface
- Be able to appreciate issues such as device driver programming and multitasking
- Be able to design and implement software that programs a given embedded system.

b) Topic outline

- Popular embedded system architecture
- Embedded system programming interfaces
- Multitasking with real-time constraints
- Task synchronization
- Software efficiency issues
- Embedded system testing and debugging

c) Evaluation and grading procedure for students

Students will be evaluated based on homework, assignments and one or more tests.

d) Course Evaluation

The department curriculum committee will evaluate this course.

4. Results of consultation

This proposal was approved at a Computer Science Department meeting. The Departments of Mechanical and Electrical and Computer Engineering were also consulted.

5. Catalog Description:

0706.4## Embedded Systems Programming

3 s.h.

(Prerequisites: 0704.390 Operating Systems)

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Embedded software is used in almost every electronic device. This course deals with software issues that arise in embedded systems programming. Important concepts covered in this course will include device programming interfaces, device drivers, multi-tasking with real-time constraints, task synchronization, device testing and debugging, and embedded software development tools such as emulators and debuggers. These concepts will be applied to design and implement embedded software for one or more modest-sized embedded systems.

From: Tirupathi R Chandrupatla
To: Kay, Jennifer S.
Date: 10/22/99 9:51AM
Subject: Consultations

Jennifer:

We support the following minor changes and course proposals from Computer Science.

Minor Changes:

- Change Semester Hours of Data Structures and Algorithms
- Change Restricted Electives for CS Majors
- Change Prereq's for CS Senior Project
- Drop pre-calc minimum grade requirement for CS majors

Course Props

- Data Structures For Engineers
- Grad Topics in CS
- Embedded Systems Programming

T.R.

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Rowan University
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Glassboro, NJ 08026
Ph: 856-256-5340 Fax: 856-256-5241

From: John L. Schmalzel
To: Kay, Jennifer S.
Date: 10/22/99 3:52PM
Subject: Re: Embedded Systems Programming Consultation

MEMO

22 OCT 1999

TO: Dr. Jennifer Kay and CS Curriculum Committee
FR: J. Schmalzel, ECE Chair

SUBJ: Consult on Embedded Systems Programming

1. Thank you for your offer to receive consultation on your proposed course.
2. We believe that embedded systems programming shouldn't be taught from an entirely software perspective. The principle role of the embedded systems developer is to wrestle with the hardware/software trade-offs needed. This requires hardware background (e.g., Principles of Digital Computers), and it requires appropriate laboratory equipment.
3. Perhaps this is an opportunity for a team-teaching effort between our two departments.

CC: ECE_Faculty