

**SIMON FRASER UNIVERSITY**  
**Senate Committee for Undergraduate Studies**  
**NEW COURSE PROPOSAL**

Course Number: CMPT 433-3

Course Title: Embedded Systems

Short Course Title: Embedded Systems

Course vector: 3 lecture

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**Course Description (for Calendar). Attach a course outline to this proposal.**

The basics of embedded system organization, hardware-software co-design, and programmable-chip technologies are studied. Formal models and specification languages for capturing and analyzing the behavior of embedded systems. The design and use of tools for system partitioning and hardware/software co-design implementation, validation, and verification are also studied.

Prerequisite: CMPT 250, CMPT 300.

Corequisite: none

Course(s) to be dropped if this course is approved: none

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**Rationale for Introduction of this Course:**

This course will be optional in the proposed Software Systems program for the Surrey campus.

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**Scheduling and Registration Information:**

Indicate effective **semester/year** course would be first offered and planned **frequency** of offering thereafter.

Fall 2009, initially offered annually in Surrey

Waiver required: no

Will this be a required or elective course in the curriculum?

Elective in the Software Systems program.

What is the probable enrolment when offered?  
40 students.

Which of your present CFL faculty have the expertise to offer this course?  
Mohamed Hefeeda, Alexandra Fedorova, Richard Vaughan, Janice Regan

Are there any proposed student fees associated with this course other than tuition fees? (if so, attach mandatory supplementary fee approval form)  
no

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**Resource Implications:**

**Note: Senate has approved (S.93-11) that no new course should be approved by Senate until funding has been committed for necessary library materials. Each new course proposal must be accompanied by a library report and, if appropriate, confirmation that funding arrangements have been addressed.**

Campus where course will be taught:  
Surrey.

Library report status

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Provide details on how existing instructional resources will be redistributed to accommodate this new course. For instance, will another course be eliminated or will the frequency of offering of other courses be reduced; are there changes in pedagogical style or class sizes that allow for this additional course offering?

See attached Software Systems Curriculum document.

Any outstanding resource issues to be addressed prior to implementation: space, laboratory equipment, etc.

See attached Software Systems Curriculum document.

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**Approvals**

1. **Departmental approval** indicates that the Department has approved the content of the course, and has consulted with other Departments and Faculties regarding proposed course content and overlap issues.

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Chair, Dept./School

Date

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Chair, Faculty Curriculum Committee

Date

**2. Faculty approval** indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required Library funds.

\_\_\_\_\_  
Date: \_\_\_\_\_  
Dean or Designate

*List which other Departments and Faculties have been consulted regarding the proposed course content including overlap issues. Attach documentary evidence of responses.*

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**Other Faculties approval** indicates that the Dean(s) or designate of other Faculties affected by the proposed new course support(s) the approval of the new course.

\_\_\_\_\_  
Date: \_\_\_\_\_

\_\_\_\_\_  
Date: \_\_\_\_\_

**3. SCUS approval** indicates that the course has been approved for implementation subject, where appropriate, to financial issues being addressed.

Course approved by SCUS (Chair of SCUS)

\_\_\_\_\_  
Date: \_\_\_\_\_

**Approval is signified by date and appropriate signature.**

## Proposed CMPT 433 Course Outline

The basics of embedded system organization, hardware-software co-design, and programmable-chip technologies are studied. Students will learn formal models and specification languages for capturing and analyzing the behavior of embedded systems. The design and use of tools for system partitioning and hardware/software co-design implementation, validation, and verification are also studied. Students will also gain familiarity with embedded-systems simulation tools, and use them to study examples of complex embedded systems.

### TOPICS:

- Overview of embedded systems and their applications
- Introduction to hardware-software co-design
- Embedded system partitioning into hardware and software modules
- System on programmable chips
- Fault-tolerant (mission and safety-critical) embedded systems
- Simulation of complex embedded systems
- Case studies of embedded systems

### GRADING:

20% homework assignments, 30% projects, 50% exams

### TEXTBOOKS:

Frank Vahid and Tony Givargis, *Embedded System Design: A Unified Hardware/Software Introduction*, John Wiley & Sons, 2002.

### PREREQUISITES:

CMPT 250, CMPT 300