

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

Course Number: CMPT 432-3

Course Title: Real-time Systems

Short Course Title: Real-time Systems

Course vector: 3 lecture

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

The design and implementation of real-time systems. Techniques for specifying system timing requirements and determining if these requirements are met. Different models for the design of real-time schedulers are examined and analyzed. The design of real-time operating systems and their role in supporting real-time systems 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.

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Library report status

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

### 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.

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

**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 432 Course Outline

The design and implementation of real-time systems. Students will learn techniques for specifying system timing requirements, and empirical and analytical models for determining if these requirements are met. Different models for the design of real-time schedulers, including the cyclic executive and priority-driven task models, are examined and analyzed. The design of real-time operating systems and their role in supporting real-time systems are also studied.

### TOPICS:

- Characteristics and applications of real-time systems
- Models for real-time systems
- Real-time scheduling
- Analysis of system schedulability and utilization bounds
- Scheduling of aperiodic and sporadic tasks
- Clock-based real-time systems
- Priority-based real-time systems
- Scheduling with shared resources
- Real-time operating systems

### GRADING:

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

### TEXTBOOKS:

Jane W.S. Liu, *Real-Time Systems*, Prentice-Hall, 2000.

### PREREQUISITES:

CMPT 250, CMPT 300