**Carleton University**
**Department of Systems and Computer Engineering**

# SYSC 4805 Computer Systems Design Laboratory
# Winter 2012

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# Course Outline

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## Course Objectives

The course develops professional level expertise in selected, important areas of the field by applying, honing, integrating and extending previously acquired knowledge, in team projects in the laboratory. Lecture periods are devoted to new knowledge required for the selected areas, to project related issues, and to student presentations. The course objectives are:

- To develop team working skills that are much needed in the software industry. Team work has been recognized as an important aspect of today's engineering education and is, as such, explicitly specified in the accreditation requirements for our program.
- To develop the communication skills of the students through presentations on theme topics.
- To obtain practical hands-on experience with a Model-Driven Development commercial tool for real-time object oriented systems, which generates code from high-level software models. This year we'll be using ***Rational Rose RealTime***, which is a UML-based engineering tool, specifically optimized for developing complex event driven real-time software applications for various domains such as telecommunications, data communications, defense, aerospace and other industries.

## Calendar Description

***Lectures: 2 hours/week; Lab: 4 hours/week***
Developing professional level expertise in selected, important areas of the field by applying, honing, integrating and extending previously acquired knowledge, in team projects in the laboratory. Lecture periods are devoted to new knowledge required for the selected areas, to project related issues, and to student presentations.

## Prerequisites

SYSC 3303 and SYSC 4800 are the prerequisite for SYSC 4805. **Prerequisite waivers will not be granted**. Students who have not received credit for the prerequisite courses

must withdraw from SYSC 4805 by the last date for registration in Winter term courses; otherwise, they will be deregistered before the end of term. Students who received DEF in the Fall 2010 session of SYSC 4800 are eligible to register in SYSC 4805, provided that they write the deferred exam in February 2011. These students can remain in SYSC 4805 if the DEF is changed to a passing grade; otherwise, they must withdraw from SYSC4805 by the last day for withdrawal from the Winter term courses (which is the last day of classes).

## Approach

This is a *laboratory* course. The instructor will give lectures in the first part of the term to present the UML Real-Time extensions supported by the tool, to introduce the use of the tool and to discuss design methodology issues. After that, the lecture periods will center around student presentations on theme topics. The presentations will be organized by teams.
During the first 4-5 weeks of the term, the students will familiarize themselves with the Rational Rose RT tool by doing a set of exercises. After that, the effort will be focused on team projects until the end of the term.
More information about student presentations, lab exercises and projects will be announced in class and posted on the web site.

## Suggested topics for student presentations

- Model-Driven Development
- Model transformations: from model to code or from model to model
- Platforms for real-time distributed and embedded systems: Real-Time Operating Systems, middleware (e.g., CORBA)
- Software engineering of OO real-time systems: software development process, analysis and design methodologies, testing, maintenance, etc.
- Standard OO modeling languages: UML, SDL, AADL, SysML (features, meta-model, XML interface for tool interoperability, applications, etc).
- UML Profiles: UML Profile for Modeling and Analysis of Real-Time and Embedded Systems (MARTE), UML Profile for Testing, UML Profile for Schedulability, Performance and Time, etc.
- Design patterns and frameworks for distributed / real-time systems
- Quality and performance of real-time systems

## Laboratory

The lab is scheduled for 4 hours on Tuesdays from 1:30 pm - 5:30 pm. During the lab sessions, the students will learn how to use the MDD tool, will work on their projects and will conduct the demo sessions by teams. Each team will be expected to demonstrate the lab exercises and the project milestones to the TA. It is important to establish the teams as soon as possible in order to be able to schedule demo times with the TAs.
The computer lab for this course is located in Room 508 AA. The lab is open seven days a week, whenever the building is open. Except for those timetable slots when the room is reserved for specific courses, you may use the lab at any time.

## Evaluation

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| Lab exercises | 10% |
| Three project milestones<br>Project report | 30%<br>10% |
| Student Presentations | 10% |
| Final exam | 40% |

## Students with Disabilities

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre for Students with Disabilities to complete the necessary letters of accommodation. After registering with the PMC, make an appointment to meet and discuss your needs with me at least two weeks prior to the final exam. This is necessary in order to ensure sufficient time to make the necessary arrangements. Please note the following deadlines for submitting completed forms to the Paul Menton Centre: **March 7, 2012** for the Winter Term.

## Plagiarism

Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offence that will not be tolerated. Please refer to the section on instructional offences in the Undergraduate Calendar for additional information.

## Health and Safety

Every student should have a copy of our Health and Safety Manual. An electronic version of the manual can be found at: http://www.sce.carleton.ca/courses/health-and-safety.pdf.

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