

Course Outline

SYSC 3110 Software Systems Development Laboratory

Lecturer

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Office hours to be determined after discussion in class

TA info will be posted on CuLearn once the roster has been firmed up.

Calendar Information

(copy-pasted from <http://calendar.carleton.ca/undergrad/courses/SYSC/>)

SYSC 3110 [0.5 credit]**Software Development Project**

Development of expertise in designing, implementing and testing maintainable, reusable software through team projects. Applying modern programming languages, design patterns, frameworks, UML and modern development processes (detection of olfactible source code defects, refactoring, iterative and incremental development, version control techniques) to medium-scale projects.

Includes: Experiential Learning Activity

Precludes additional credit for SYSC 2101, SYSC 3010 and [COMP 2404](#).

Prerequisites

- [SYSC 2004](#) and [SYSC 2100](#), and enrolment in Software Engineering. Indeed, the course requires basic knowledge in object-oriented programming (SYSC 2004) and a solid understanding of data structures and algorithms (SYSC 2100) to get into the more advanced topic of designing maintainable software.

Lectures two hours a week, laboratory three hours a week.

- And students who have not satisfied the prerequisites for this course must either withdraw from the course or obtain a prerequisite waiver by visiting the Engineering Undergraduate Academic Support Office.

Course Objectives

- Development of expertise in designing, implementing, and testing industrial-quality, reusable code through individual and team projects.
- Applying and extending previously acquired knowledge of patterns, frameworks, UML, iterative and incremental development, to medium and large-scale systems.

Learning Outcomes (in no particular order)

Among others things:

1. can design software

2. can write code that applies a given design
3. can pick the appropriate data structure and algorithm and implement them
4. can draw simple UML class and interaction diagrams to capture and document design decisions
5. can test software
6. can detect code “smells”
7. has some early experience of working in teams

Graduate Attributes (GA's)

The Canadian Engineering Accreditation Board requires graduates of engineering programs to possess 12 attributes at the time of graduation. Activities related to the learning outcomes listed above are measured throughout the course and are part of the department's continual improvement process. Graduate attribute measurements will not be taken into consideration in determining a student's grade in the course. For more information, please visit: <https://engineerscanada.ca/>.

GA	Learning Outcome
1.4.S Programming and algorithms	3
1.8.S Software engineering	5
4.4 Design solution(s)	1
4.5 Design implementation / task(s) definition	2
5.1 Diagrams and engineering sketches	4
6.1 Personal and group time management	7
6.2 Group culture, group dynamics	7
6.3 Leadership: initiative and mentoring, areas of expertise, and interdisciplinary teams	7

Textbook

Selected chapters from: *Objects First with Java: A Practical Introduction Using BlueJ*, any edition (the current one is the Sixth Edition), David J. Barnes and Michael Kolling, Pearson Education Limited/Prentice Hall.

Note that this was the textbook for many offerings of SYSC2004, i.e. a pre-requisite course for SYSC3110.

The URL for the book's Web site is <http://www.bluej.org/objects-first>.

Web Site

Course material and lab exercises will be posted on cuLearn.

Lecture and Lab Periods

Two one-hour lectures per week: time and location TBD

Labs 3 hours a week: time and location TBD. **Important: there will be lab sheets distributed during those lab hours, which you will need to complete during the lab and submit as part of your overall grade.**

Outline (more detail available on the course web site)

Part I User Interface Design as an Exercise in Using Design Patterns

Part II Design in Practice: Refactoring and Test-driven development

Part III Framework Studies: JUnit, Persistence and possibly others.

Lab hours will be used to introduce Eclipse as an Integrated Development Environment and to practice material introduced in class.

Project

A major component of the course is a project that will lead you through the process of building a reasonably complex system. This will be a group project. Each team member must participate in all aspects of the project: design, coding, testing and debugging, etc.

The project will be divided into several milestones, which will be evaluated and graded separately, with the weight depending on the milestone.

Exams

There are two exams in this course: a midterm exam (1/3 of the weight of the “Exam” component of the final grade), which will take place during class at some point during the term, and a final lab exam (2/3 of the “Exam” component) which will be held during the University's examination period. It is important to note that the final exam will require a thorough understanding of the topics discussed in class or in the lab, and so meticulous note-taking and study of those notes before the exam are important skills for success.

The final examination is for evaluation purposes only and will not be returned to students. You will be able to make arrangements with the instructor or with the department office to see your marked final examination after the final grades have been made available.

Students who miss the final exam may be granted permission to write a deferred examination (see the Undergraduate Calendar for regulations on deferred exams). These students have additional months to study and a less crowded examination schedule compared to their colleagues who write the final exam. As such, it is only fair to expect substantially better performance from these students on the deferred examination than on the final exam.

Evaluation and Grading Scheme

Students will be evaluated by means of in-lab assignments, a project, a midterm exam and a final lab exam.

To pass the course, a student must pass the project and the examination component (D- or better in both components). For these students, the grade will be calculated as follows:

Lab Assignments:	10%
Project:	40%
Exam (midterm exam + final exam):	50%

General Regulations

Attendance: Students are expected to attend all lectures and lab periods. The University requires students to have a conflict-free timetable. For more information, see the current *Undergraduate Calendar, Academic Regulations of the University, Section 2.1.3, Course Selection and Registration and Section 2.1.7, Deregistration*.

Health and Safety: Every student should have a copy of our Health and Safety Manual. A PDF copy of this manual is available online: <http://sce.carleton.ca/courses/health-and-safety.pdf>

Deferred Term Work : Students who claim illness, injury or other extraordinary circumstances beyond their control as a reason for missed term work are held responsible for immediately informing the instructor concerned and for making alternate arrangements with the instructor and in all cases this must occur no later than three (3.0) working days after the term work was due. The alternate arrangement must be made before the last day of classes in the term as published in the academic schedule. For more information, see the current *Undergraduate Calendar, Academic Regulations of the University, Section 4.4, Deferred Term Work*.

Appeal of Grades: The processes for dealing with questions or concerns regarding grades assigned during the term and final grades is described in the *Undergraduate Calendar, Academic Regulations of the University, Section 3.3.4, Informal Appeal of Grade and Section 3.3.5, Formal Appeal of Grade*.

Academic Integrity: Students should be aware of their obligations with regards to academic integrity. Please review the information about academic integrity at: <https://carleton.ca/registrar/academic-integrity/>. This site also contains a link to the complete Academic Integrity Policy that was approved by the University's Senate.

Plagiarism: Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated.

Academic Accommodation: You may need special arrangements to meet your academic obligations during the term. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/> For an accommodation request, the processes are as follows:

- **Pregnancy or Religious obligation:** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>
- **Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students

- with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*).
- **Survivors of Sexual Violence:** As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/sexual-violence-support/>.
 - **Accommodation for Student Activities:** Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

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