



UNIVERSITY OF CALGARY  
FACULTY OF SCIENCE  
DEPARTMENT OF COMPUTER SCIENCE  
COURSE OUTLINE

1. **Course:** SENG 301: Software Analysis and Design

**Lecture Sections:**

L01, TR 9:30-10:45, ICT 121, Robert Walker, ICT 546, 210-9593, [walker@ucalgary.ca](mailto:walker@ucalgary.ca)

Office Hours: TR 12:00-13:00

**Course Website:** D2L

**Computer Science Department Office, ICT 602, 220-6015, [cpsc@cpsc.ucalgary.ca](mailto:cpsc@cpsc.ucalgary.ca)**

2. **Prerequisites:** CPSC 319 or 331

(<http://www.ucalgary.ca/pubs/calendar/current/computer-science.html#3620>)

3. **Grading:** The University policy on grading and related matters is described in sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Assignments (4)	35%
Laboratory Exercises (15)	15%
Midterm Exam	20%
(In-Class Thursday November 17 <sup>th</sup> , 2016)	
Final Examination	30%

This course **will** have a Registrar's Scheduled Final Exam.

Special Regulations affecting the Final Grade: To obtain an overall grade of C- or better in the course, the student must obtain a C- or better on the weighted combination of the examination components.

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar. Section 3.6. It is the student's responsibility to familiarize themselves with these regulations. See also Section E.6 of the University calendar.
5. **Scheduled Out-of-Class Activities:** REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY. If you have a clash with this out-of-class activity, please inform your instructor as soon as possible so that alternative assignments can be arranged.

6. **Course Materials:**

Object Oriented Software Engineering: Practical Software Development Using UML and Java 2<sup>nd</sup> Edition, Lethbridge and Laganière, *McGraw Hill* (Required)

How to Use Objects, Gast, *Addison-Wesley* (Recommended)

Code Complete 2<sup>nd</sup> Edition, McConnell, *Microsoft* (Recommended)

Clean Code: A handbook for Agile Software Craftsmanship, Martin, *Prentice Hall* (Recommended)

**Online Course Components:**

Lecture slides, assignments, notes and lab instructions will be on D2L.

7. **Examination Policy:** Students may bring a single, US letter sized sheet of paper to examinations ("cheat sheet") as a memory aid. Students should also read the Calendar, Section G, on examinations.
8. **Approved Mandatory and Optional Course Supplemental Fees:** None.

9. **Writing across the Curriculum Statement:** In this course, the quality of the student's writing in the weighted components of the course will be a factor in the evaluation of these components. See also Section E.2 of the University Calendar.

10. **Human Studies Statement:** Students will be expected to participate as subjects or participants in projects. See also Section E.5 of the University Calendar.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- a) **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offense that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K, Student Misconduct to inform yourself of definitions, processes and penalties.
- b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points which can be found in each classroom and building.
- c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at [http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities\\_0.pdf](http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf). Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Computer Science.
- d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>
- f) **Student Union Information:** VP Academic (403) 220-3911 [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca) SU Faculty Rep (403) 220-3913 [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca) and [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca), Student Ombuds Office: (403) 220-6420 [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca), <http://ucalgary.ca/provost/students/ombuds>
- g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend your cell phone should be turned off unless instructed otherwise. All communications with other individuals via laptop computers, cell phones or other devices connectable to the internet in not allowed during class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- h) **U.S.R.I.:** At the University of Calgary feedback provided by students through the Universal Student ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses ([www.ucalgary.ca/usri](http://www.ucalgary.ca/usri)). Your responses make a difference – please participate in USRI surveys.

Department Approval \_\_\_\_\_ Date \_\_\_\_\_

Associate Dean's Approval for out of regular class-time activity: \_\_\_\_\_ Date: \_\_\_\_\_

Associate Dean's Approval for Alternate final examination arrangements: \_\_\_\_\_ Date: \_\_\_\_\_

*\*A signed copy of this document is kept on file in the Computer Science main Office ICT 602\**

## **SENG 301 Syllabus**

### **Tentative Topics Covered**

Review of object-orientation  
Structural and behavioural modelling  
Requirements analysis  
Testing  
Test case selection  
Test automation  
Test coverage  
Design  
Design principles  
Design patterns  
Design analysis  
Debugging  
Moving from requirements to design  
Moving from design to implementation  
Refactoring  
Planning for change  
APIs, frameworks, and libraries  
Software processes

### **Learning Outcomes:**

By the end of the course: students will:

- Implement a small to medium-scale software system conforming to a design.
- Design a small- to medium-scale software system that conforms to a given description.
- Implement and to execute an automated test suite.
- Design and to justify a test plan.
- Analyze the strengths and weaknesses of a given design.
- Model a small- to medium-scale software system to represent the relevant aspects in a specified context.
- Modify an existing design and its implementation in order to achieve a specified effect.