Computer Science COMP-3415-FAO
Software Engineering

Instructor Information:

Instructor: Dr. Thiago E. A. de Oliveira
Office Location: OR1016
E-mail: talvesd [at] lakeheadu.ca
Office Hours: Friday. 2:30PM - 5:30PM - (if needed, book by email and I will return a Zoom link)

Teaching Assistant: To be defined **TA Email:** To be defined.

Course Delivery:

Lectures: Mondays and Wednesdays, 5:30-7:00 PM
Labs: Mondays, 3:30 PM - 4:30 PM
Where: OA 2017 (LEC)
Dates: 2023-09-05 - 2023-12-04 (***Study Week***: October 9 - 13, 2023)
Final Date to Withdraw (Drop): Friday, November 3rd, 2023.

Attendance and participation in lectures are highly recommended!

Pre-requisites: COMP-2412 Data Structures and COMP-2477 Object Oriented Programming.

Description:

An introduction to a spectrum of software engineering concepts: software requirement and specification, project planning and design, software development and testing, software process management, and software maintenance. Several of these topics of software design and testing will be explored in detail. Object-oriented methodology and UML will be used. A team project and class discussion will be an integral part of the course.

Course Learning Objectives:

By the end of this course, students will be able to:

1. Students will gain a solid understanding of the entire software development lifecycle, including requirements gathering, design, development, testing, process management, and maintenance.
2. Students will be able to effectively analyze and document software requirements, ensuring that software projects align with user needs and expectations.
3. Students will develop the skills to plan and design software projects, considering factors such as scope, resources, and architectural design principles.
4. Through practical experience, students will become proficient in coding software and conducting rigorous testing to ensure software quality and reliability.
5. Students will learn how to apply software development methodologies and best practices to manage the software development process efficiently and effectively.

6. Students will be able to apply object-oriented programming principles and use the Unified Modeling Language (UML) to design and represent complex software systems.
7. Through team projects and class discussions, students will enhance their ability to collaborate effectively with peers and communicate software-related concepts and ideas clearly and persuasively.

Course Outline:

1. Software and software engineering
2. Review of object orientation
3. Basing software development on reusable technology
4. Developing requirements
5. Modeling with classes
6. Using design patterns
7. Focusing on users and their tasks
8. Modeling interactions and behavior
9. Architecting and designing software
10. Testing and inspecting to ensure high quality.

Suggested Text:

Object-Oriented Software Engineering: Practical Software Development Using UML and Java*, 2nd Edition.* Timothy Lethbridge, Robert Laganiere, McGraw-Hill

Software Engineering, *I**an Sommerville, 10th edition*

Schedule (subject to change):

Week	**Tentative Topic**	**Readings from the textbook**
Week 1	Software and software engineering	Chapter 1
Week 2	Review of object orientation	Chapter 2
Week 3	Basing software development on reusable technology	Chapter 3
Week 4	Developing requirements	Chapter 4
Week 5	Modeling with classes	Chapter 5
Week 6	Holiday or Break (Thanksgiving, Study Week)	
Week 7	Using design patterns	Chapter 6
Week 8	Focusing on users and their tasks	Chapter 7
Week 9	Modeling interactions and behavior	Chapter 8
Week 10	Architecting and designing software	Chapter 9
Week 11	Testing and inspecting to ensure high quality	Chapter 10

Week 12	Managing the software process	Chapter 11
Week 13	**Review** **Final day of classes (Monday, December 4, 2023)**	Review

Assignments and Evaluations:

Students taking this course must understand and agree that:

(1) Unless otherwise allowed by the course instructor, Students must complete the assignments in this course without the assistance of anyone else.

(2) Unless otherwise allowed by the course instructor, Students must not access any sources or materials (in print, online, or in any other way) to complete any course exam.

Students must further understand and agree that, if they violate either of these two rules, or if they provide any false or misleading information about their completion of course assignments or exams, they may be prosecuted under the Lakehead University Student Code of Conduct – Academic Integrity, which requires students to act ethically and with integrity in academic matters and to demonstrate behaviours that support the University's academic values.

Group assignments: All team members must demonstrate their contributions towards each item that compose the final mark.

Late Assignments: Late assignments will automatically receive a 0, however they **will be** reviewed to provide formative evaluation feedback and **must be** submitted for course completion.

Grading Scheme:

Item	***% of Final Grade***	***Tentative dates (2023)***
Quizzes 1 - 4	10	Throughout the course (You will be informed 1 week ahead of the quiz)
Assignments 1 - 4	20	Throughout the course
Midterm	20	One week before or after the Study Week.
Team Project	20	November 26th
Final Exam	30	Refer to university's Exam Timetables

Course Policies:

- Behavioral standards to follow: Student Code of Conduct - Academic Integrity
- Attendance and participation in class discussions is highly recommended.
- Students can communicate with the instructor through email using **COMP-3415** - as a **prefix** in the subject line of their message.
- The course outline and schedule are not fixed and subject to change based on class flow.

- You will be taught theoretical Software Engineering during lecture sessions and will practice during the lab sessions.
- A passing mark is normally 50% of the total weight of all components.
- There will be no make-up test.
- University's attendance policy is followed.
- There will be 4 assignments. Late assignments will be penalized 20% and will not be accepted after passing a week from the due dates. Assignments and their due dates and time will be posted on MyCourseLink/D2L and announced via emails to all registered students.
- There will be 4 quizzes. These quizzes will be conducted in the lab sessions. Quizzes' date and time will be announced in advance.

Copyright:

Students should be aware that all instructional, reference, and administrative materials prepared for this course are protected in their entirety by copyright. Students are expected to comply with this copyright by only accessing and using the course materials for personal educational use related to the course, and that the materials cannot be shared in any way, without the written authorization of the course instructor. If this copyright is infringed in anyway, students may be prosecuted under the Lakehead University Student Code of Conduct – Academic Integrity, which requires students to act ethically and with integrity in academic matters and to demonstrate behaviours that support the University's academic values.

Regulations:

It is the responsibility of each student registered at Lakehead University to be familiar with, and comply with all the terms, requirements, regulations, policies and conditions in the Lakehead University Academic Calendar. This includes, but is not limited to, Academic Program Requirements, Academic Schedule of Dates, University and Faculty/School Policies and Regulations and the Fees and Refund Policies and Schedules (Lakehead University Regulations webpage, 2023-24).

Academic Integrity:

A breach of Academic Integrity is a serious offence. The principle of Academic Integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should view the Student Code of Conduct - Academic Integrity for a full description of academic offences, procedures when Academic Integrity breaches are suspected and sanctions for breaches of Academic Integrity.

Supports for Students: – there are many resources available to support students. These include but are not limited to:

- Health and Wellness
- Student Success Centre
- Student Accessibility Centre
- Library
- Lakehead International
- Indigenous Initiatives

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities and/or medical conditions to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please contact Student Accessibility Services (SC0003, 343-8047 or sas@lakeheadu.ca)