The University of Western Ontario
Faculty of Engineering
Department of Electrical and Computer Engineering

ECE 9200 / 9020 – Software Engineering for Human-Computer Interface Design

Course Outline: 2026

Objectives:

This graduate course highlights specific material from Software Engineering and Cognitive Science with the purpose of designing and testing user interfaces for interactive visualization, or for supervisory control of complex systems. The course material is selected from recent papers in order to stay current with HCI developments and scientific research results. Although these research areas are broad, the topics covered have been selected so as to conform to emerging trends in HCI through the ACM and IEEE special interest groups. There is a final project, which draws together additional lab demos, and allows the student to pursue a project that can potentially be tailored to their own research background. The course highlights the interplay between Software Engineering as an enterprise, and the importance of basic research on human perception and cognition to guide, inform, and inspire the design of HCI systems.

Topics:

1. Introduction to Software Architectures for Human-Computer Interface Design.
2. Behavioural Representations of User Tasks for Software Design Specification
3. Cognitive Science: Human Perception, Action, and Cognition.
4. System Development for Interactive Systems and 3D Visualization.
5. Merging Behavioural and Structural Representations into System Implementations
6. User Interface Evaluation and Human Performance Metrics

Specific Learning Objectives:

1. To establish familiarity with topics related to human factors in the design of User Interfaces.
2. To establish the mapping between user-centred requirements and systems-level implementation.
3. To exercise Software Engineering analysis and design methods.
4. To introduce advanced applications-level development within a structured systems architecture.

General Learning Objectives

Knowledge Base	3/2	Engineering Tools	3/2	Impact on Society	2/1
Problem Analysis	3/3	Individual & Team Work	3/3	Ethics and Equity	2/1
Investigation	3/2	Communication	3/2	Economics and Project Mgmt	1/1
Design	3/3	Professionalism	2/1	Life-Long Learning	2/1

Rating: *x*/*y*, where *x* is the cognitive level (1: Remember, 2: Understand, 3: Apply) at which the attribute is assessed and *y* is the academic level (1: Beginner, 2: Intermediate, 3: Advanced) at which the attribute is assessed.

Course Materials: Any High Level Language Programming Textbook or printed resource is acceptable. In addition, we will revisit some controversial topics covered in a book developed at TUM: Bruegge,B and Dutoit,A (2010) "Object-Oriented Software Engineering Using UML, Patterns, and Java", Prentice Hall. (Free)

Reference Materials: To be uploaded to OWL site when covered in class.

Evaluation:

		Late Penalty Daily	Presentation
Online and/or In-class Participation	5 %		
Online Lab Assignments	10%	5%	20%
Online or InPerson Midterm Quiz and In person Written Final Evaluation	31% 40%	5%	5%
Project-based Evaluation	14%	5%	5%

Class participation will be assigned objectively based on your attendance in class, your participation in zoom chats and your interactivity, as well as your participation in formative quizzes.

***Use of English Policy:**

In accordance with the policy of the University, the grade assigned to all written and oral work presented in English shall take into account syntax, diction, grammar and spelling. In the professional life of an engineer, the manner in which oral and written communications are presented is extremely important. An engineering student must develop these skills as an integral part of the undergraduate program. To encourage the student to do so, the grades assigned to all written and oral work will take into account all aspects of presentation including conciseness, organization, neatness, use of headings and the preparation and use of tables and figures.

All work will be marked first for content after which a penalty not to exceed the maximum shown may be applied for lack of proficiency in English and/or presentation.

Attendance Policy:

All classes, laboratories, and tutorials are mandatory, unless otherwise stated. Student participation in discussions are strongly encouraged as part of the learning experience and may be monitored and recorded by the instructor. Any student who, in the opinion of the instructor is absent, or inactive, too frequently from class or laboratory periods in any course, will be reported to the Associate Dean (after due warning has been given). On the recommendation of the department concerned, and with the permission of the Dean, the student will be debarred from evaluation in the course.

Cheating and Plagiarism Policy:

Students must design their own software implementations. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks in essays where appropriate and by proper referencing such as footnotes or citations. University policy states that cheating, including plagiarism is a scholastic offence. The commission of a scholastic offence is attended by academic penalties which might include expulsion from the program. If you are caught cheating, there will be no second warning.

All submissions may be subject for review to commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (http://www.turnitin.com)

Missed Midterm Policy:

If a student misses an evaluation component, it will not be rescheduled. The student must follow the Instructions for Students unable to Write Tests and provide documentation to their Department within 24 hours of the missed test. The Department will decide whether to allow the reweighting of the test; the reweighting

means the marks normally allotted for the test will be reallocated to the final exam. If no reasonable justification for missing the test can be found, then the student will receive a mark of zero on the evaluation.

If a student is going to miss the midterm examination for religious reasons, they must inform the instructor in writing within 48 hours of the announcement of the exam date or they will be required to write the exam.

Faculty of Engineering Policy on Repeating All Components of the Course:

Students who are required to repeat an Engineering course must repeat all components of the course. No special permissions will be granted enabling a student to retain laboratory, assignment, or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted for grading by the student in subsequent years.

Internet/Bulletin Board Policy:

It is the student's responsibility to read the course website and/or bulletin board and be aware of any information that is posted about the course. If the student fails to act on information that has been posted on these sites and does so without a legitimate explanation (i.e., those covered under the illness/compassionate form), then there are NO grounds for an appeal.

Course Accessibility:

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Course Instructor: Prof. Roy Eagleson, Ph.D., P. Eng.

Email: eagleson@uwo.ca

Consultation Hours: As arranged via email.

Course Format: In-person

Course Website: owl.uwo.ca has abruptly been moved to westernu.brightspace.com Stay tuned if there are any sudden changes.

Sickness

Students should immediately consult with the Instructor (for a particular course) or Associate Chair (Graduate) (for a range of courses) if they have problems that could affect their performance. The student should seek advice from the Instructor or Associate Chair (Graduate) regarding how best to deal with the problem. Failure to notify the Instructor or the Associate Chair (Graduate) immediately (or as soon as possible thereafter) will have a negative effect on any appeal. Obtaining appropriate documentation (e.g., a note from the doctor) is valuable when asking for accommodation due to illness.

Students who are not able to meet certain academic responsibilities due to medical, compassionate or other legitimate reason(s), could request for academic consideration. The Graduate Academic Accommodation Policy and Procedure details are available at: https://www.eng.uwo.ca/graduate/current-students/academic-support-and-accommodations/index.html

Statement on Academic Offences
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Health/Wellness Services
Students who are in emotional/mental distress should refer to Mental Health Support at
https://www.uwo.ca/health/psych/index.html for a complete list of options about how to obtain help.

Accessible Education (AE)
Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.
Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education (AE), a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AE and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations may include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

Statement on Gender-Based and Sexual Violence
Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at the following website:
https://www.uwo.ca/health/student_support/survivor_support/get-help.html To connect with a case manager or set up an appointment, please contact
support@uwo.ca.

Statement on the Use of Generative Artificial Intelligence (AI)
For the entire history of Computer Engineering, we have supposed that what is special about Computation is in microcosm the same that makes human Cognition possible. For that reason, we embrace the advent of more and more intelligent tools on the Computer side, as tools to be used by Humans. Accordingly, we embrace the

use of all computer-based tools within the course and program. It's a natural evolution, but it cuts both ways. But be cautious how you celebrate, because naturally the course will become more and more challenging, to reflect the improvements in your tools.