Western University
Faculty of Engineering
Department of Electrical and Computer Engineering

ECE 9065 – Web Application Development

COURSE OUTLINE 2023-2024

DESCRIPTION

This course aims to provide students with hands-on experience in designing, developing, and deploying web applications using cutting-edge technologies. The curriculum also covers the essential aspects of managing and securing the underlying infrastructure required for web applications. By the end of the course, students will have gained proficiency in various programming languages, tools, and frameworks necessary for modern web development.

ENROLLMENT RESTRICTIONS

Enrollment in this course is restricted to graduate students in M.Eng Program (M.E.Sc or Ph.D. students are not eligible). Students must possess a solid foundation in programming concepts and have prior familiarity with HTML and JavaScript. The course SE 3316 is anti-requisite for this course.

COURSE FORMAT

Face-to-face

TOPICS

Topic No.	Description	Learning Activities	Tentative timeline
1	Introduction		
	Lesson 1: Introduction to the Course	• Lectures • Additional reading materials • Assignment	Week 1
	Lesson 2: Overview of Web Development and How the Web Works		
	Lesson 3: Overview of Essential Technologies and Tools for Web Development		
	Lesson 4: Brief Introduction to Source Code Management with Git		
2	Web Technologies and Fundamentals		
	Lesson 1: HTML Fundamentals	• Lectures • Additional reading materials	Week 2
	Lesson 2: CSS Styling		Week 2
	Lesson 3: Introduction to JavaScript		Week 3
	Lesson 4: JavaScript in Web Pages		Week 4

	Lesson 5: XML, URL Notation, and Unicode	• Assignment • Project	Week 5
3	HTTP Protocol		
	Lesson 1: Identify key elements of HTTP protocol	• Lectures	Week 6
	Lesson 2: HTTP Verbs and Request-Response Cycle	• Additional reading materials • Assignment • Project	Week 7
4	Web Services and Modern Development		
	Lesson 1: Introduction to Web Services and REST	• Lectures	Week 8
	Lesson 2: Creating RESTful Web Services with Node.js	• Additional reading materials	Week 9
	Lesson 3: Consuming RESTful Web Services with Angular	• Assignment • Project	Weeks 10-11
	Lesson 4: Building Web Applications with Express and Angular		Week 12

SPECIFC LEARNING OUTCOMES

Degree Level Expectation	Weight	Assessment Tools	Outcomes
Depth and breadth of knowledge	25%	• Assignments • Project • Examinations	• Understanding of advanced concepts and theories • Awareness of important current problems in the field of study • Understanding of computational and/or empirical methodologies to solve related problems
Research & scholarship	15%	• Project	• Ability to conduct critical evaluation of current advancements in the field of specialization • Ability to conduct coherent and thorough analyses of complex problems using established techniques/principles and judgment
Application of knowledge	30%	• Assignments • Project • Examinations	• Ability to apply knowledge in a rational way to analyze a particular problem • Ability to use coherent approach to design a particular engineering system using existing design tools
Professional capacity / autonomy	5%	• Project	• Awareness of academic integrity • Ability to implement established procedures and practices in the coursework • Defends own ideas and conclusions • Integrates reflection into his/her learning process
Communication skills	15%	• Project	• Ability to communicate (oral and/or written) ideas, issues, results and conclusions clearly and effectively

Awareness of limits of knowledge	10%	• Project	• Awareness of the need of assumptions in complex scientific analyses and their consequences • Understanding of the difference between theoretical and empirical approaches • Ability to acknowledge analytical limitation due to complexity of practical problems

ASSESSMENTS

Assessment Type	Material Covered	Tentative Due Date	Weight
Quizzes	All Topics	Weekly	20%
Lab Assignment 1	Topic 2 (HTML & CSS)	Sept. 24	12%
Lab Assignment 2	Topic 2 (JavaScript)	Oct. 8	8%
Lab Assignment 3	Topics 3 & 4	Nov. 5	20%
Lab Assignment 4 (Web App Project)	All Topics	Dec. 3	40%

Activities in which collaboration is permitted:

- Lab Assignment 4
  Lab 4 can be group of up to 3.

Activities in which students must work alone (collaboration is not permitted):

- Lab Assignment 1
- Lab Assignment 2
- Lab Assignment 3

All laboratory assignments are checked for similarity and must be submitted on OWL as well as demonstrated during class. Email submissions will be discarded. Failure to follow lab submission instructions may result in penalties of up to 10% of each assignment. Lab submission deadline will be normally on Sundays at 9:00pm. Late submissions will be accepted until 11:55pm on the due date with a penalty of 1%. Submissions after that will not be accepted.

Weekly quizzes will be conducted every week using iClicker or OWL, and one quiz is dropped from grade calculation. In addition to this, one make-up quiz will be offered at the end. No other make-up opportunities will be offered if you miss a quiz for any reason (e.g. loss of internet).

REQUIRED TEXTBOOK

"Fundamentals of Web Development" by Randy Connolly and Richard Hoar, 3rd Edition, ISBN-13: 9780135863350, Publisher: Pearson

COURSE MATERIAL

All essential course materials, including lecture notes, lab assignments, and important announcements, will be accessible through OWL.

OPTIONAL COURSE READINGS

W3Schools Online Web Tutorials: https://www.w3schools.com/

CHEATING, PLAGIARISM/ACADEMIC OFFENCES
Academic integrity is an essential component of learning activities. Students must have a clear understanding of the course activities in which they are expected to work alone (and what working alone implies) and the activities in which they can collaborate or seek help; see information above and ask instructor for clarification if needed. Any unauthorized forms of help-seeking or collaboration will be considered an academic offense. University policy states that cheating is an academic offence. If you are caught cheating, there will be no second warning. Students must write their essays and assignments in their own words. Whenever students take an idea or a passage of text from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence. Academic offences are taken seriously and attended by academic penalties which may include expulsion from the program. 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_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in 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).

CONDUCT
Students are expected to follow proper etiquette to maintain an appropriate and respectful academic environment. Any student who, in the opinion of the instructor, is not appropriately participating in course activities and/or is not following the rules and responsibilities associated with the course activities, will be reported to the Associate Dean (Graduate) (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Associate Dean (Graduate), the student could be debarred from completing the assessment activities in the course as appropriate.

HEALTH/WELLNESS SERVICES
As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several health and wellness related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Faculty of Engineering has a Student Wellness Counsellor. To schedule an appointment with the counsellor, contact Kristen Edwards (khunt29@uwo.ca) via confidential email and you will be contacted by our intake office within 48 hours to schedule an appointment.

Students who are in emotional/mental distress should refer to Mental Health@Western: http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

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

ACCESSIBLE EDUCATION WESTERN (AEW)
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 Western (AEW): http://academicsupport.uwo.ca/accessible_education/index.html

AEW is a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW 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 include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.