

**COLLEGE OF ENGINEERING**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CMPS 350 Web Development Fundamentals**  
**Spring 2023**

**Instructor Information**

Name: Dr. Abdelkarim Erradi

Academic title: Associate Professor

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Office Hours:

**Sunday 12:20-1:30pm** at *C07-132 Female Engineering Building*

**TA Information**

TBD

**Class/Laboratory Schedule**

Two hours theory and three hours embedded laboratory.

**Coordinator Information**

Same as the instructor.

**Course Information**

Catalog Description:

Concepts, protocols and enabling technologies related to the development of modern web applications. Fundamentals of designing and developing dynamic and interactive web applications using HTML and related standards, scripting languages, client-side and server-side programming. Hands-on Lab to design and develop Web applications.

Credits:

3 Credit hours

Contact Hours:

2 Lecture hours

3 Lab hours

Prerequisites:

- CMPS 251 Object Oriented Programming

Textbook(s):

- [\*Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics\*](#), 5<sup>th</sup> Edition, Jennifer Robbins, ISBN-13: 978-1491960202, 2018, O'Reilly Media, Inc.

- [\*JavaScript: The Definitive Guide\*](#), 7<sup>th</sup> Edition, David Flanagan, ISBN-13: 978-1491952023, 2020, O'Reilly Media, Inc.

#### References:

- Web Development and Design Foundations with HTML5, 10/E. Terry Felke-Morris. ISBN-10: 0136681549, ISBN-13: 978-0136681540, 2020, Pearson.
- JavaScript for impatient programmers (ES2022 edition), Dr. Axel Rauschmayer, <https://exploringjs.com/impatient-js/index.html>
- W3Schools Online Web Tutorials <http://www.w3schools.com/>
- Mozilla Developer Network <https://developer.mozilla.org>
- Node.js Tutorial <http://www.tutorialspoint.com/nodejs/>

#### Course Objectives:

The objectives of this course are to help students acquire an understanding of how to:

- Design interactive web applications using latest available standards and web technologies.
- Implement dynamic and interactive web applications using established client-side and server-side technologies.

#### Course Learning Outcomes (CLO):

1. Design web interfaces using standard web technologies.
2. Implement dynamic web applications using client-side and server-side technologies.
3. Design and implement interactive web applications.
4. Work effectively in teams to develop an interactive and dynamic web application.

#### Relationship of Course Outcomes to Student Outcomes (SO):

Course Learning Outcomes (CLO)	Related CS Student Outcomes (SO)					
	1	2	3	4	5	6
1		√				
2		√				
3		√				
4		√	√		√	√

#### Student Outcomes (CS-SO):

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

#### Topics Covered:

Topics	Chapter	Weeks	Assessment
HTML	T1 - Part II. HTML for Structure	1.5	<b>Q1 (week 2)</b>
CSS	T1- Part III. CSS for Presentation	1.5	<b>A1 (week 3)</b>
JavaScript	T2 - Chapters 3, 4 and 5	1	<b>Q2 (week 4)</b>
JavaScript OOP & Unit Testing	T2 - Chapters 6 to 10	1	<b>A2 (week 5)</b>
Client-side JavaScript	T2 - Chapter 15	1	<b>Q3 (week 6)</b>
Web API with Node.js	T2 - Chapter 16	1	<b>A3 (Week 7)</b>
<b>Midterm Exam</b>		<b>1</b>	<b>Lab Midterm (Week 8)</b>
Asynchronous JavaScript	T2 - Chapter 13	1	<b>Q4 (week 9)</b>
Data Management using Prisma	Online readings	1	<b>A4 (week 10)</b>
Server-side content rendering using Next.js and React	Online readings	3	<b>Q5 (Week 11)</b>
			<b>A5 (Week 13)</b>
			<b>Q6 (week 13)</b>
Securing Web applications: authentication and authorization	Online readings	1	<b>Lab Exam</b>
<b>Total</b>		<b>14</b>	

#### **Method of Instruction**

The course learning outcomes will be achieving using:

- **Active Learning:** Teaching will be through in-class lectures, demos, activities and discussion, and a project. Throughout the course, students complete hands-on lab activities and assignments that build their practical knowledge and skills to design, implement and test Web applications.
- **Class Discussions:** Students are expected to participate in discussions about the lecture material.
- **Project:** There will be an integrative application development project. Students will need to allocate time outside of class to work on the project to practice and reinforce the concepts and skills introduced in the lectures.

#### **Learning Activities**

To achieve the course learning outcomes, students will carry out several learning activities:

1. **Readings:** The lectures will follow the topics listed in the course schedule. The students are expected to read the assigned textbook chapter, online resources and slides. The reading

assignments will elaborate on information presented in the lectures. **Each student is responsible for reading all related material prior to each lecture.** Students are expected to learn independently as much as needed in order to complete the course requirements.

2. **Lectures:** Lectures will cover theoretical concepts and principles related to Web application development in project-based and example-driven way. Extensive examples will be used to illustrate the taught principles. Students are expected to attend every lecture; this is where the course material will be discussed and ambiguities clarified. Class participation is highly encouraged. The technologies to be applied in the project and the assignments will be presented in the lectures via examples and demos. Students are required to practice and extend the examples and the demos provided.
3. **Lab Activities:** A weekly lab session will include hands-on in-lab activities and assignments to enable students to practice and apply the material learned in class. Multiple practical Lab activities on web application development are carried out individually.
4. **Quizzes:** Used to encourage students to regularly study the course content, check their understanding of the studied concepts, and receive quick feedback as they progress through the course.
5. **Exams:** The midterm and the final exams have a theoretical part and a practical programming part to build a solution to a simplified problem.
6. **Project:** Students will complete a web application project with significant use cases. The course project involves designing, implementing and testing a web application delivered in 2 phases. The project is carried out in groups of three students and it will require the students to leverage the material learned during the course to design and implement a real-world web application. The project is used as a tool to help the students reinforce concepts and gain a hand-on experience. It also offers an opportunity to study covered concepts in more depth and to apply them to realistic scenarios.

### Assessment Methods and Grading Policy

#### Theory:

Quizzes:	10% (5 out of 6) – <b>no make-up quiz if absent</b>
Midterm Exam:	10%
Final Exam:	10% (Consult final exams timetable)
Project Phase 1:	15%
Project Phase 2:	15%

#### Lab:

Lab Assignments:	20% (4 out of 5)
Midterm Lab Exam:	10%
Final Lab Exam:	10% (During the last Lab)

### ABET Contribution of Course to Professional Component

Math & Basic Science : 20%  
Engineering : 80%  
Engineering Design :  
General Education :

### **Computer/Software Usage**

VS Code  
Node.js  
Prisma  
Visual Paradigm UML tool

### **Laboratory Projects**

Two-phase project to develop an interactive dynamic website.

### **Course Ground Rules**

- University attendance policies will be enforced. Attendance will be taken during each class meeting. Please arrive on time. You are responsible for all material covered and all announcements made in class. Classes will start on time. No one should be more than 5 minutes late.
- Use of electronic devices such as smartphones and tablets are strictly prohibited during the lecture. Switch off mobile phones during lecture time, pay utmost attention to lecture. Please try your best to minimize distraction for your classmates.
- Do not hesitate to ask if you have any question about any of the material discussed during the lecture.
- Academic Honesty such as plagiarism (cheating on an exam, submitting work that is not your own) will not be tolerated. The university rules will be enforced in case of cheating and plagiarism. Students must submit their own work without copying from the Internet or from other students. Students could be asked to explain their implementation. A student who shares code with another student will be treated the same as the person who does the copying. Outsourcing or getting external help to complete assignments is strongly prohibited, and disciplinary actions will be taken if outsourcing is confirmed.

### **University Code of Conduct**

QU expects its students to adopt and abide by the highest standards of conduct in their interaction with professors, peers, staff members and the wider university community. Moreover, QU expects its students to act maturely and responsibly in their relationships with others. Every student is expected to assume the obligations and responsibilities required from them for being members of the QU community.

As such, a student is expected not to engage in behaviors that compromise their integrity, as well as the integrity of QU. Further information regarding the University Code of Conduct may be found on the web at <http://www.qu.edu.qa/students/code-of-conduct>

### **Academic Support and Learning Resources**

The University Student Learning Support Center (SLSC) provides academic support services to male and female students at QU. The SLSC is a supportive environment where students can seek assistance with academic coursework, writing assignments, transitioning to college academic life,

and other academic issues. SLSC programs include: Peer Tutoring, the Writing Lab, Writing Workshops, and Academic Success Workshops. Students may also seek confidential academic counseling from the professional staff at the Center.

Contact Information for Students Support and Learning Resources:

Tel: (00974) 4403 3876

Fax: (00974) 4403 3871

Location: Female Student Activities Building

E-mail: [learningcenter@qu.edu.qa](mailto:learningcenter@qu.edu.qa)

### **Student Complaints Policy**

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the student handbook.

### **Declaration**

This syllabus and contents are subject to changes in the event of extenuating circumstances. The instructor (with approval of the Head of Department) reserves the right to make changes as necessary. If changes are necessitated during the term of the course, the students will be notified by email communication and posting the notification on the online teaching tool Blackboard. It is the student's responsibility to check on announcements made while they were absent.

Faculty Name: Abdelkarim Erradi

Last Modified: 29/01/2023

Date: 29/01/2023