

CMPS 356 - Web Applications Design and Development

Syllabus and Course Admin



Dr. Abdelkarim Erradi

Department of Computer Science & Engineering

Qatar University

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Outline for Today

- Course introduction
- Grading
- Policies

About the Instructor

- **Dr. Abdelkarim Erradi**

- **Office:** Office 132 Female Engineering Building
- **Phone:** 4403 4254

Office hours:

- Female: Sunday **12:15-1:15pm** at C07-132 Female Engineering Building
- Male: Tuesday **12:15-1:15pm** at E104 - CSE Meeting Room
- You can talk to me **after** class if you have issues/questions
- **Best way to contact me is via Teams chat**

Course Learning Outcomes

1. Design web applications based on established design patterns and best practices.
2. Construct a web application using various server-side and client-side programming frameworks.
3. Design, implement, test, deploy and scale a web application using latest web development frameworks and tools
4. Demonstrate understanding of common security threats for web applications.

Course Style

- Gain practical **hands-on experience** with web-based technologies
 - Often, the best way to understand something is to build it yourself
 - Labs Activities/Assignments
 - Project: Substantial implementation project to design and implement a Web Application
- => Put what you learned into use!
- => This is the closest you can get to experience how real-world Web applications are designed and built

Why this Course?

- Web Applications are **critical applications** that **automate business processes** and **support the organization in achieving its goals**
 - There are typically characterized by:
 - A large number of concurrent users. Hence, they need to be **scalable**
 - Users often require fast response time & good user experience
 - Mission critical hence they need to be **secure, reliable** and **highly available**
- => This course **equips you with the skills** and best practices needed to design, develop, test, deploy, scale and secure Web applications having the required quality attributes

Prerequisites



Web Client

Request

Response



Web Server

Frontend development

HTML for page Structure & Content



CSS for styling



JavaScript for interaction



JavaScript

Backend development

Dynamic Content

Web API

Data Management



Topics	Weeks	Assessment
Web Dev Review	1	
Single-Page Application (SPA) using React	3	A1 (week 3)
Next.js: client-side rendering (CSR), static site generation (SSG), server-side rendering (SSR), and incremental static regeneration (ISR)	3	A2 (week 5)
Testing Web Apps	1	A3 (Week 7)
Midterm Exam	1	Lab Midterm (Week 9)
WebSockets for real-time communication	1	A4 (Week 10)
Securing Web applications: authentication, authorization, and confidentiality.	2	A5 (Week 12)
Securing Web applications: OWASP Top 10	1	A6 (Week 14)
Deploy and scale Web applications: Cloud deployment, Docker Containers, Kubernetes, Microservices, and Serverless Functions	1	Lab Exam
Total	14	

Recommended Textbooks

React.js – Key Concepts, 1st Edition, Maximilian Schwarzmüller, 2022, Packt Publishing [↗](#)

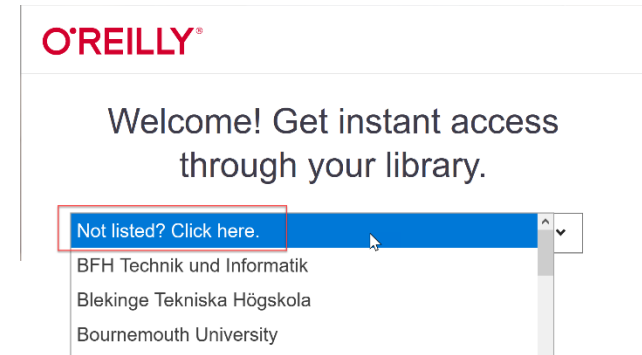


Real-World Next.js, 1st Edition, Michele Riva, 2021, Packt Publishing [↗](#)



How to get the textbook online

- Visit <https://www.oreilly.com/library/view/temporary-access>
- Select 'Not listed, click here'



- Enter your QU email address to gain access
 - You will get an email to set a password for your account
- **React.js – Key Concepts**
<https://learning.oreilly.com/library/view/react-js-key/9781803234502/>
- **Real-World Next.js**
<https://learning.oreilly.com/library/view/real-world-next-js/9781801073493/>

Your Grade is Based on


Theory:

Midterm Exam:	10%
Final Exam:	10% (Consult final exams timetable)
Project Phase 1:	15%
Project Phase 2:	15%

Lab:

Lab Assignments:	25% (5 out of 6)
Midterm Lab Exam:	12.5%
Final Lab Exam:	12.5% (During the last Lab)

How to succeed in this course....

- ❑ Do your weekly assigned readings
- ❑ **Read the slides before you come to the class**
- ❑ **Exercise a lot – study as many examples as possible**
 -  – Understand and enhance the examples I provide as well as the ones in the textbook and the ones in the provided resources
- ❑ **Attend and participate in class**
 - ❑ Many of the exam questions are from the class explanation
- ❑ Do all the assignments and project yourself. Actively contribute to your project.
- ❑ Seek help when needed and ask questions (and do it EARLY): During Lectures/Labs & Come to office hours



We learn swimming by swimming and we learn design and programming by practicing it!

Software we will use

- VS Code <https://code.visualstudio.com/>
- GitHub
- Node.js
- MongoDB
- For modeling we will use **Visual Paradigm**
<https://ap.visual-paradigm.com/qatar-university/license.jsp>
- Other tools will be communicated to you as we go



GitHub will be used to deliver Slides, Examples, Assignments, and Project

Check <https://github.com/cmeps356f22/cmeps356-content>
regularly!

Post your technical questions to

<https://github.com/cmeps356f22/cmeps356-content/issues>

All Communications using Teams (No emails)

Important Notes

- **Attendance...** QU attendance policies will be enforced
 - Do not miss classes/labs
- **Start your assignments early!!!**
- This is a senior-level course and students are expected to learn independently as much as needed in order to complete the course requirements
 - Do not expect me to find/fix your code bugs
 - Do not expect me to find and fix your technical issues
 - I can only give you high level suggestions and guidance

No 'Free Riding' allowed

- 'free riders' (who do not contribute much) => not acceptable and not fair for hardworking students
 - You must actively contribute to your project and do your ultimate best to deliver the best possible results
 - Otherwise you will be asked to do the project alone



Plagiarism / Cheating

- “Getting an unfair academic advantage”
 - Using other people's work as your own
 - Not doing your assignments yourself
- All the code you submit has to be your own
 - Only exception: Code I have provided or explicitly authorized
 - **NO** code you have found on the web. **NO** sharing with others.
- **Do your homework and project yourself**
 - Do NOT copy from each other or from the Internet - **I will know it!**
 - You can be picked-up randomly to explain your implementation
 - Cheating will be treated very seriously
- Penalties START with a zero on the assignment, failing the course! and other disciplinary actions as per QU policy

To do before next class

- Install the required software: VS Code & GitHub desktop (see announcement on Teams)
- Decide your team members and enter them in the spreadsheet on Teams
- Create your GitHub account
- Prepare any questions you might have



I wish you a fruitful and enjoyable journey!