CMPS 356 - Web Applications Design and Development

Syllabus and Course Admin

Dr. Abdelkarim Erradi

Department of Computer Science & Engineering

Qatar University


بِسْمِ اللَّهِ الرَّحْمَٰنِ 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

Backend development

- Dynamic Content
- Web API
- Data Management

https://github.com/cmps350s22/cmps350-content

Topics

Topics	Weeks	Assessment
Web Dev Review & React Introduction	1	
React Fundamentals	1	
React Hooks	2	A1 (week 3)
React Router	1	
Next.js: server-side rendered apps	3	A2 (week 5)
Midterm Exam	**1**	**Lab Midterm (Week 9)**
Testing Web Apps	1	A3 (Week 7)
Progressive Web Apps	1	A4 (Week 10)
Securing Web applications: authentication, authorization, and confidentiality.	1	A5 (Week 12)
Securing Web applications: OWASP Top 10	1	A6 (Week 14)
Deploy and scale Web applications	1	Lab Exam

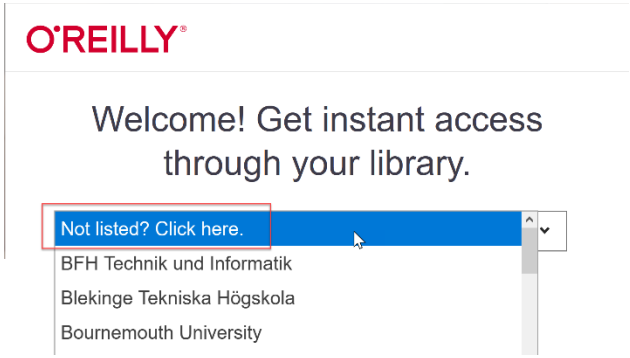
Recommended Textbooks

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:	20%
Project Phase 2:	10%

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/cmps356f22/cmps356-content

regularly!

Post your technical questions to

https://github.com/cmps356f22/cmps356-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!