CSC 436: Web Applications
Fall Quarter 2021
Last Revised – September 12, 2021

Course Information

Meeting time: Tuesday 5:45PM - 9:00PM
Location: LEWIS 00105 at Loop Campus and Online Async
Homepage: https://d2l.depaul.edu
Prerequisites: CSC 435 and CSC 447

Instructor Information

Instructor: Paul Duszak
Email: pduszak@depaul.edu
Office Location: TBD / Online
Office Hours: Via Zoom - Thursday 5:15-6:45pm, please schedule an appointment

Course Description

This course covers the design and development of modern web applications and their interaction with web services. The primary focus is on client-side web applications using AJAX-techniques to access web services. Possible topics include: HTML5; JavaScript/TypeScript; MVC and single-page application programming models, e.g., AngularJS; programming and security models for browsers; client-side web applications with local storage; data synchronization; HTTP, proxies, and caching; Node.js; RESTful web services.

Course Grading

- Homework 75%
- Final Project (the final project will not be team-based) 25%

Course Drop Dates

Please reference: https://academics.depaul.edu/calendar/Pages/default.aspx

Course Workstation / Software Requirements

- Windows, Mac, or Linux workstation
- Node.js (LTS or newer) and NPM
- Visual Studio Code (or preferred IDE / text editor)
- Git
- Postman (or alternative REST client)

Communication / Email Guidelines

- Anticipate a response within 24 hours of sending your email
- Please include **CSC436** in email subject lines and your full name in the body
- If requesting help with code, please push the latest copy of your code to a public Github repository and provide a link and specific description of the issue you're facing. Also provide what you've attempted to resolve the issue

Learning Outcomes

Students will review, understand, and build modern web applications utilizing React as a front-end framework and Express/Node as the backend framework and runtime. Additionally, students will utilize modern development practices, languages, and processes.

Tenative Course Schedule

Week 1: Fundamentals - HTML, CSS, and Javascript
- Syllabus Review
- HTML, HTML Forms and CSS Basics
    - Chrome Developer Tools
    - Bootstrap & CSS Frameworks
- Visual Studio Code
- Javascript Fundamentals
- Advanced Javascript ES6
- Development tools
    - Visual Studio Code & Git
    - NodeJS Runtime
    - NPM Package Management

Assignment: Build an HTML login page using Bootstrap; JavaScript Exercises

Week 2: Frontend - React
- React Introduction and Principles
- React Hooks and review of various hooks
- State Hook Review
- Structuring React projects
- Static and Stateful components

Assignment: Build a simple Todo list application

Week 3: Frontend - React Continued
- Reducer and Effect Hooks review
- React Context and Global State in React
- Routing Hooks and single page applications

Assignment Refactor Todo list application to utilize hooks

Week 4: Backend - REST APIs
- CRUD
- REST API Basics
- HTTP
- Postman, Swagger usage and review
- Mocking REST API's using json-server
- API Authentication and oAuth
- Third party APIs
- Promises, Async/Await

Assignment: Design and create a mock REST service using json-server

Tenative Course Schedule (continued)

Week 5: NodeJS, Express, and Advanced Javascript

- Intro to Express
- Serving static resources
- Route Handlers
- Middleware
- Platform as a Service and Heroku Deployment

Assignment: Build an Express app implementing week 4 mock REST service

Week 6: Authentication

- User Registration
- User Authentication
- JWT token management
- Project Introduction

Assignment: Project start

Week 7: Data persistence and MongoDB

- MongoDB
- ORMs and Mongoose
- Schema and Models
- Document creation and updating
- Searching for records
- Project Q+A, FAQ, and additional support

Assignment: Project check-in

Week 8: Front-end and Back-end testing

- Testing front-end React applications
- Testing back-end Express applications
- Project Q+A, FAQ, and additional support

Assignment: Project check-in

Week 9: Other web application technologies

- REST API alternative: GraphQL
- Sockets and real-time applications
- Working with real-time streaming media and WebRTC
- Project Q+A, FAQ, and additional support

Assignment: Project check-in

Week 10: Project Presentations

Course Policies

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

Course Policies (continued)

Respect for Diversity & Inclusion at DePaul University as aligned with our Vincentian Values

At DePaul, our mission calls us to explore "what must be done" in order to respect the inherent dignity and identity of each human person. We value diversity because it is part of our history, our traditions and our future. We see diversity as an asset and a strength that adds to the richness of classroom learning. In my course, I strive to include diverse authors, perspectives and teaching pedagogies. I also encourage open dialogue and spaces for students to express their unique identities and perspectives. I am open to having difficult conversations and I will strive to create an inclusive classroom that values all perspectives. If at any time, the classroom experience does not live up to this expectation, please feel free to contact me via email or during office hours.

Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Please see https://resources.depaul.edu/teaching-commons/teaching/Pages/online- teaching-evaluations.aspx for additional information.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

More information can be found at: https://resources.depaul.edu/teaching-commons/teaching/academic-integrity/Pages/default.aspx.

Posting work on online sites, such as Hero

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Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at: http://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx

Course Policies (continued)

Incomplete Grades

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. All incomplete requests must be approved by the instructor of the course and a CDM Associate Dean. Only exceptions cases will receive such approval. Information about the Incomplete Grades policy can be found at:
http://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx

Preferred Name & Gender Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter so that I may make appropriate changes to my records. Please also note that students may choose to identify within the University community with a preferred first name that differs from their legal name and may also update their gender. The preferred first name will appear in University related systems and documents except where the use of the legal name is necessitated or required by University business or legal need. For more information and instructions on how to do so, please see the Student Preferred Name and Gender Policy at
http://policies.depaul.edu/policy/policy.aspx?pid=332

Students with Disabilities

Students seeking disability-related accommodations are required to register with DePaul's Center for Students with Disabilities (CSD) enabling them to access accommodations and support services to assist with their success. There are two office locations:

- Loop Campus (312) 362-8002
- Lincoln Park Campus (773) 325-1677
- Email: csd@depaul.edu

Students who register with the Center for Students with Disabilities are also invited to contact Dr. Gregory Moorhead, Director of the Center, privately to discuss how he may assist in facilitating the accommodations to be used in a course. This is best done early in the term. The conversation will remain confidential to the extent possible.
Please see https://offices.depaul.edu/student-affairs/about/departments/Pages/csd.aspx for Services and Contact Information.

Online office hours (online sections only)

Faculty should be accessible to students using Zoom, Skype or other similar platforms for the duration of the office hours. Faculty must be accessible on the designated platform for the duration of the office hours.