Course Syllabus

CISC474 (010): Advanced Web Technologies

Fall 2025, Time:

Instructor: Dr. Austin Cory Bart (**acbart@udel.edu (mailto:acbart@udel.edu)**)

Teaching Assistant: John Fulkerson

Office Hours:

- Monday 2-3pm: John Fulkerson in Smith 102a
- Friday 11:30-12:30am: John Fulkerson in Smith 102a
- ___ ____: Dr. Bart in Smith 411
- ___ ____: Xinyang Shen in ____

Communication: Email & Canvas

Final Exam: TBD

Introduction:

This course deals with technologies for the World Wide Web and how they relate to enterprise-level application development. In this class, we will examine client-server technologies necessary to create seamless and scalable applications, including API development, UI design, client- and server-side programming, and project management. By the end of this course, you should be more able to:

- Develop basic client-side websites using HTML, CSS, and TypeScript
- Implement high-quality web applications that serve dynamic content from a database
- Explain modern web development design pattern
- Describe the complexities of browser compatibility, network latency, and HTTP caching
- Identify basic security concerns with web applications
- Work under version control
- Work in a dynamic team environment
- Articulate the benefits of using an Integrated Development Environment (IDE)
- Adapt and integrate new web technologies as they arise

This course is also project-based. As a result, you will work in small groups throughout the semester. Typically, Mondays/Wednesdays will be for short lectures and exercises, while Wednesday/Fridays will be reserved mainly for in-class group work on the term project.

Prerequisites: Students are expected to have completed an introductory course on software engineering at the University of Delaware, CISC 275.

Required Materials: Students are expected to have a functioning laptop that they can bring to class and complete assignments on. The laptop must be capable of running web browsers, the IDE, and other required course software like Git and Docker.

Required Technology: At the minimum, we expect you to leverage the following technologies in your assignments:

- HTML/CSS
- TypeScript (not JavaScript)
- React
- NextJS
- NestJS
- Prisma
- Postgres
- NPM
- Git
- VS Code

In some cases, we may explicitly allow you to use other technologies for an assignment (e.g., JavaScript instead of TypeScript, MongoDB instead of Postgres); if so, the assignment will clearly indicate this. Otherwise, assume that the default technology list applies!

There are many technologies that are allowed but not clearly indicated. Any library on NPM is generally allowed, unless it is used in lieu of the required technology. Be reasonable, and when in doubt, don't be afraid to ask.

Grading:

Term Project(s) (60%): In teams of 3-4, students will create and present a web application to the class. The team project will be a web application with a clear purpose and utility. We will have an initial round of proposals to the class with lightning talks, and then teams will be formed based on shared interest. Creativity will be rewarded, but a considerable portion of the grade will come from demonstrating correct, working functionality. Your grade will be based on the quality of your team’s final deliverables as judged by the instructional staff and the class’s evaluation of your final presentation. Additionally, team members will evaluate members of their group via peer evaluation forms. The instructor will also review contributions made in the Version Control System (Git) and monitoring of the group. The grade for this assignment will be broken up into milestones throughout the semester.

Individual Assignments (25%): Each student will iteratively work on an individual web application. By the end of the semester, you should have created a simple but functional web application that solves a specific problem, as described in the corresponding assignment. This will be an ongoing project where you add features incrementally as we learn about them. The grade for this assignment will be broken up into milestones throughout the semester.

Midterm (10%): This will be an in-class, closed notes, on-paper exam. The exam will largely focus on the materials covered in lectures and the individual assignments. This particular grading item is subject to change; if so, then these points will be distributed at the instructor's discretion to the other grading categories.

Class Participation, Peer Evaluations, & Quizzes (5%): While there is no explicit attendance policy, another 10% of your grade will consider your participation in class, performance on any in-class quizzes given at the discretion of the instructional staff, and peer feedback opportunities during the semester.

Tentative Schedule

This schedule is subject to change. Please go to the Modules view for the latest information.

In general, the Monday lecture will be more content heavy. The Friday lecture is likely to be time to work on assignments and get help. The Wednesday lecture will be a mixture of the two.

Week	Calendar	Material	Assignments
1	8/27 - 8/29	Syllabus, Introduction, Basics of Servers	Installation stuff, Pitch Creation
2	9/1 - 9/5	HTML, CSS, TypeScript, React review	Project setup, Pitch Presentations
3	9/8 - 9/12	REST APIs, Servers and Routing, Backend/Frontend Communication	Group Project Formation
4	9/15 - 9/19	Single Page Web Applications, Jest/Testing	Group Project Milestone 1
5	9/22 - 9/26	Databases, Prisma, SQL, ORM	Individual Project Milestone 1
6	9/29 - 10/3	Client Side State Management, LocalStorage, Cookies	
7	10/6 - 10/10	Authentication, Authorization, Oauth, JWT	Group Project Milestone 2
8	10/13 - 10/17	External Libraries, Web Assembly	
9	10/20 - 10/24	More Advanced Database Design (indexes), NoSQL, GraphQL	Individual Project Milestone 2
10	10/27 - 10/31	CI/CD Pipelines and Deployment	
11	11/3 - 11/7	Async/Await	Group Project Milestone 3
12	11/10 - 11/14	Web Security	

13	11/17 - 11/21	Website Accessibility	Individual Project Milestone 3
	11/24 -11/28	Thanksgiving Break	
14	12/1 - 12/5	Websockets and SSE	Group Project Milestone 4
15	12/8	Final Lecture	Individual Project Due
16	?	Final Presentations (during Final Exam Timeslot)	

Course Policies

Academic Integrity. Please familiarize yourself with UD policies regarding academic dishonesty. To falsify the results of one's research, steal the words or ideas of another, cheat on an assignment, re-submit the same assignment for different classes, or allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. Penalties for violating these policies will be severe. Complete details of academic integrity policy can be found at:

http://www1.udel.edu/studentconduct/policyref.html (http://www1.udel.edu/studentconduct/policyref.html)

Any code taken from tutorials, Stack Overflow, or external sources should be documented with at least a hyperlink.

Policy on AI: Students are free to use AI tools (e.g., Copilot, Claude, ChatGPT) as they see fit to enhance their learning. However, you are discouraged from becoming reliant on these tools, since incorrect usage can actually damage your learning. If you are not sure how to achieve something without AI, then you should be sure to aggressively pursue that understanding. Ask follow-up questions, talking to a human if that is helpful.

You are responsible for all code that you commit or submit. If you are asked about that code, you must be able to explain it. Failure to explain it will negatively impact your grade. Do not submit code that you do not understand. Get explanations of the code and concepts.

Statement on Inclusiveness. The instructional staff supports the University of Delaware's commitment to creating a campus free of discrimination based on race, color, religion, sex, national origin, age, disability, sexual orientation, gender identity, or veteran status. We further affirm the importance of cultivating an intellectual climate that allows us to better understand the similarities and differences of those who constitute the UD community, as well as the necessity of working against inequalities that may also manifest here as they do in the broader society.

Late Policy. Submitted work must be submitted no later than 11:59 PM on the date it is due unless otherwise noted. Late assignments are not accepted. Most likely, the grading will automatically drop at

least one assignment from each category.

Absence. Attendance is expected in this course, although it will not be tracked closely. Some activities will be done in class, some of which will affect the attendance portion of the grade. Absences do not need be excused, because a reasonable number of missed activities will be dropped from the grade calculation. Extended university approved absences should be discussed with the instructor.

Note that attendance is not simply being physically present. Using your laptop or phone during lecture distracts you and your neighbors, negatively impacting their learning. Therefore, if you are physically attending class, you must also be mentally present. You are encouraged to take notes on paper, and forbidden from using electronic devices.

The exception to this rule is during activities that specifically require your laptop, e.g., days where we are working on class assignments. But when the instructor is lecturing, you are expected to be paying attention. Failure to do so may result in grade penalties or polite requests to leave the room.

Communication. Whenever the need arises, students are encouraged to send direct messages to the instructional staff via email. Students are also requested to give at least one full business day for a response, though the instructional staff will try to be prompt.

Accessibility. UD is committed to providing physical accessibility and access to information technology resources to individuals with disabilities. Please see this website for further information: **https://www.udel.edu/home/accessibility/ (https://www.udel.edu/home/accessibility/)**

Syllabus. There will likely be minor changes and updates to the syllabus throughout the semester. Significant changes will be announced in class and posted to Canvas, but all changes will be documented in the changelog at the bottom of this document. Students should stay up to date by getting in touch with a friend or the instructional staff, if/when they end up missing class.

Canvas. All class announcements, assignments, and other materials will be posted to the classes' Canvas website. Please check often for updates.

Recommended Resources

Where possible, start with official documentation for the library you are using. If you need general resources on specific technologies, here are some links:

TypeScript: **https://www.typescriptlang.org/docs/handbook/intro.html (https://www.typescriptlang.org/docs/handbook/intro.html)**

HTML and CSS: **https://developer.mozilla.org/en-US/ (https://developer.mozilla.org/en-US/)**

React: **https://react.dev/ (https://react.dev/)**

NextJS: **https://nextjs.org/docs (https://nextjs.org/docs)**

NestJS: **https://docs.nestjs.com/ (https://docs.nestjs.com/)**

SQL: https://www.w3schools.com/sql/sql_intro.asp (https://www.w3schools.com/sql/sql_intro.asp)

Git: https://www.w3schools.com/git/ (https://www.w3schools.com/git/)

Prisma: https://www.prisma.io/docs/orm/overview/introduction/what-is-prisma (https://www.prisma.io/docs/orm/overview/introduction/what-is-prisma)

VS Code: https://code.visualstudio.com/docs (https://code.visualstudio.com/docs)

References

This course draws inspiration from several sources, including courses by: Matthew Mauriello (https://www.eecis.udel.edu/~mlm/), Greg Silber (https://www.cis.udel.edu/people/faculty-profile/?id=217), Michael Haggerty (https://www.eecis.udel.edu/~haggerty/), Frank San Miguel (https://www.linkedin.com/in/franksanmiguel), Phil Conrad (http://udel.edu/~pconrad/), Terry Harvey (https://www.eecis.udel.edu/~harvey/), and others. This syllabus is also derived from the syllabus of Kurtis Heimerl (https://docs.google.com/document/d/17RNcB0wb3I1ZbAaLXEuwB5W7X32MOVvP8LAhMONxA-Q/edit), Neha Kumar (https://docs.google.com/document/d/1glclRPED-CHztyWpoZWjdK6iE-T2r9arsAOOSPYsdfE/edit?usp=sharing), and Barath Raghaven (https://raghavan.usc.edu/2019-spring-computing-for-social-good/).

Change Log

- 1:04pm on 8/19/2025 by acbart: Initial revisions from version provided by mlm
- 12:41pm on 8/27/2025 by acbart: Clarified excused absence policy.

Course Summary:

Date	Details	Due
Fri Aug 29, 2025	Create a Website (https://udel.instructure.com/courses/1872819/assignments/13836733)	due by 11:59pm
	Pitch Creation (https://udel.instructure.com/courses/1872819/assignments/13836735)	due by 11:59pm
Sun Aug 31, 2025	Join the Discord (https://udel.instructure.com/courses/1872819/assignments/13836954)	due by 11:59pm
	Survey - Welcome (https://udel.instructure.com/courses/1872819/assignments/13836955)	due by 11:59pm
Wed Sep 3, 2025	Setup Individual Web Application	due by 11:59pm

Date	Details	Due
	(https://udel.instructure.com/courses/1872819/assignments/13836780)	