# CISC 474 (010): Advanced Web Technologies

**Fall 2021, Time:** TTh 9:30-10:45 PM (EST) [SHL 123]

**Instructor:** Matthew L. Mauriello (mlm@udel.edu)

**Instructor Office Hours:** T 12:00-1:00 PM (EST) [SMI 408] *or by appointment [100 S. Main (Suite 109)]*

**Teaching Assistant:** Prerana Khatiwada (preranak@udel.edu)

**Teaching Assistant Office Hours:** M 6:20-7:00PM or Th 6:00-7:15PM [SMI 102A] *or by appointment*

**Communications:** Email & Canvas

**Final Exam:** T 12/14 10:30AM-12:30PM

## 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, as well as project management. By the end of this course, you should be more able to:

* Develop basic client-side websites using: HTML, CSS, and JavaScript
* Implement high-quality web applications that serve dynamic content from a database
* Demonstrate an understanding of the "Model-View-Controller" design pattern
* Understand the complexities of browser compatibility, network latency, and HTTP caching
* Understand 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)
* Prepare yourself for learning new web technologies as they arise

This course is also a project-based course. As a result, you will work in small groups throughout the semester. Typically, Tuesdays will be for short lectures and exercises while Thursdays will be largely reserved 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 this is CISC 275.

**Required Materials:** Students are expected to have a laptop or personal computer capable of running several web browsers, IDE, and similar programs including Visual Studio Code, Python 2.X/3.X, PyCharm, WebStorm, GitHub Desktop, Putty or similar terminal applications, and SFTP tools. All other materials for participating in class will be provided. If students find their term-project is restricted by the availability of resources, they are asked to reach out regarding available support; there is no guarantee but subscriptions to a web-based API, acquiring low-cost hardware, or conducting lightweight experiments on Amazon Mechanical Turk may be possible.

*This course draws inspiration from several sources including courses like it. See the references below.*

## Grading:

**Term Project(s) (60%):** In teams of 4 – 5, students will propose a term project and present their final product as a group presentation during the final presentation period. In past semesters, students have written web-based games, interactive applications, graphing systems, and other things. It is totally up to you and your group. Be creative and have fun with it. Your grade will be based on the overall quality of your team’s final deliverables as judged by the instruction staff and the class’s evaluation of your final presentation. Additionally, team members will evaluate members of their group via peer evaluation forms.

**Individual Assignments (25%):** Each student will iteratively work on a personal website. By the end of the semester, you should have a created a simple but functional website that could support a resume, project portfolio, another creative use, or some combination thereof.

**Midterm (10%):** This will be an in-class, closed notes, on paper exam. The exam will largely focus on the materials covered in lecture and by the individual assignments.

**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.

**Hall of Fame or Hall of Shame (Bonus):** Students may contact the instructional staff to schedule a single presentation on a well-or-poorly designed (SFW) website from their personal experience online. Presentations via Google Slides should be approximately 5-minutes, provide context, demonstrate the user interface or interaction being critiqued, and then offer a definitive critique assigning the site to the Hall of Fame or Hall of Shame based on some of the topics or principles discussed in class.

## Tentative Schedule:

|  |  |  |
| --- | --- | --- |
| **Week** | **Material** | **Assignments** |
| **Module 1 (Week 1 – 5) [Basic Tools]** | | |
| 8/31 | Syllabus, Introduction to HTML |  |
| 9/7 | HTML (Continued), CSS, and JavaScript | Personal Website I (11:59 PM) [Thursday] |
| 9/14 | jQuery, Bootstrap, & D3 | Term Project Proposal (11:59 PM) [Thursday] |
| 9/21 | SQL Database Transactions |  |
| 9/28 | Website Accessibility, Cross-Browser Compatibility | Personal Website II (11:59 PM) [Thursday] |
| **Module 2 (Week 6 – 9) [Client-Side Applications]** | | |
| 10/5 | Structured Web Development, MVC, & MVVM | Term Project Presentations [Tuesday & Thursday] Class Review Forms (11:59 PM) [Friday] |
| 10/12 | REST API |  |
| 10/19 | Single-Page Applications (SPAs) | Term Project Proposal Refined (11:59 PM) [Thursday] |
| 10/26 | Web Security, etc. | Personal Website III (11:59 PM) [Thursday] |
| **Midterm (Week 10)** | | |
| 11/2 | Midterm Exam (In-class, closed notes) |  |
| **Module 3 (Week 11 – 15) [MEAN Stack]** | | |
| 11/9 | MEAN Stack 1 |  |
| 11/16 | MEAN Stack 2 |  |
| *11/23* | *Thanksgiving Break* |  |
| 11/30 | Content Wrap-up (Flex) & In-class Development Time |  |
| 12/7 | In-class Development Time |  |
| 12/14 | Project Presentations (Final Exam Period) | Class Review & Peer Review Forms (11:59 PM) |

## 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>

**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. Assignments that are late are assessed a 10% per day late penalty, and after three days they will not be accepted. Saturday and Sunday are each days. This policy is necessary because late assignments are burdensome for the TA, both in terms of separate handling and separate time grading. However, students will be allowed one no-questions-asked 48-hour extension for any individual assignment submission during the semester. Please let the instructional staff know via email if you are planning to use your extension. This extension policy does not apply to group work.

**Excused Absence.** There is not an explicit attendance policy. If you must miss a class, please let the instructional staff know via email (preferably in advance). Since participating in regular class discussions and activities is part of your grade, absences should not be excessive. To determine what is an excused absence, we will follow the guidelines here: <https://catalog.udel.edu/content.php?catoid=40&navoid=6626>

**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. For example, if students are concerned about how they will be evaluated, you are encouraged to ask the instructional staff as early as possible.

**Accessibility.** UD is committed to providing both 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/>

**Syllabus.** There will likely be minor changes and updates to the syllabus throughout the semester. These changes will be announced in class and posted to Canvas. 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.

**COVID-19 Precautions.** Students and faculty are required to wear a mask on campus regardless of vaccination status. Our department has advised that if a student refuses, the instructional staff is to ask them to leave class. Should a student refuse to leave, we are to cancel class for the day. Incidents will be reported to public safety.

## Recommended Resources:

If you’re someone that likes to have an on-hand reference, I’ve found the following books helpful or interesting to glance at from time to time. You don’t need them for the course but used copies should be inexpensive even for relatively recent editions. Loaner copies can likely be found as well.

* Basics
  + Robson and Freeman, “Head First HTML and CSS.” O'Reilly.
  + Flanagan, “JavaScript: The Definitive Guide.” O’Reilly.
  + jQuery Community Experts, The jQuery Cookbook. O’Reilly
* Specifics
  + Murray, “Interactive Data Visualization for the Web.” O’Reilly
  + Grus, “Data Science from Scratch.” O’Reilly
* Theory
  + Hartson and Pyla, “The UX Book.” Morgan Kaufmann.
  + Kraut, Brynin, and Kiesler, “Computers Phones, and the Internet.” Oxford.

## References

This course draws inspiration from several sources including courses by: [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 syllabus by: [Kurtis Heimerl](https://docs.google.com/document/d/17RNcB0wb3I1ZbAaLXEuwB5W7X32MOVvP8LAhMONxA-Q/edit), [Neha Kumar](https://docs.google.com/document/d/1gIclRPED-CHztyWpoZWjdK6iE-T2r9arsAOOSPYsdfE/edit?usp=sharing), and [Barath Raghaven](https://raghavan.usc.edu/2019-spring-computing-for-social-good/).