



School of Computing and Information Sciences  
Willamette University

# CS-262-01: Full-Stack Web Development

## Spring 2025

### Instructor:



Fred Agbo, PhD  
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Office: Ford Hall 209  
Office Hour: T, TH (11-1pm)

Web: <https://willamette.instructure.com/courses/7421>  
Lecture: M/W (2:50pm – 4:20pm)  
Lecture Hall: Ford 301  
Course Discord Server: <https://discord.gg/dwH5aJem>

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*(This syllabus is subject to modification as the semester progresses - I'd inform you when there is an update)*

### BRIEF COURSE DESCRIPTION

This is a hands-on, project-based course that delves into both frontend and backend development technologies to create fully functional data-driven websites. The course will begin by covering the concepts and practices necessary for creating Internet content, a technical overview of the Internet environment, and the structure of the World Wide Web. The technical segment will focus on the design and implementation of an effective website at the introductory level. Then, we will delve into the overall architecture of Internet applications at a high level with special emphasis on server-side programming. Topics include an introduction to web architectures, responsive frontend design frameworks, backend technologies, testing frameworks, and deployment strategies. Students will gain practice using version control, translating software requirements, building incremental software, maintaining code quality, and deploying code to a server.

**Prerequisite(s):** There is no prerequisite for taking this course. Although this course may be more suitable for students who have completed or are currently enrolled in *the software development* course. However, students without this requirement could enroll but must be enthusiastic about programming. ***Please note that while the instructor provides weekly lectures and guides, much of the work for the class will occur outside the weekly class meetings. Hence students should be prepared to spend quality time practicing and delivering results on a regular basis.***

### Recommended Text and Materials for this course:

**Text:** [Fundamentals of Web Development](#)

**Authors:** Connolly, Randy.

**Availability:** This book is not available for free, at least from my knowledge. While I will also be pointing students to other resources available free online, I will base the class lecture on the chapters in this book, courtesy of Pearson.

### Learning Objectives:

At the end of this course, the student should be able to:

- Build a simple website that organizes information effectively
- Use cascading style sheets to create style standards for a website.
- Create a navigational framework that matches the content and genre of the site.
- Describe the issues involved in developing a web interface.
- Summarize the needs and issues involved in website implementation and integration.
- Explain why accessibility issues are an important consideration in web page development.
- Design and implement a web interface
- Understand how server-side technology works.
- Develop websites with server-side technology such as PHP
- Use databases in web applications.
- Understand common data models used in content management systems.
- Implements mechanisms for maintaining state in web applications.
- Understand basics of web security.

## COURSE STRUCTURE AND ASSESSMENT

This course will consist of lectures, weekly readings, class discussions (show/tell), and project presentations (mid-term and finals). Each course component is very important to gain expected learning outcomes including grades. Looking at its comprehensive nature, students are encouraged to give their best in all the components of the course. Full class attendance and participation are mandatory.

- **Lectures**

Lectures and class discussions will be held every Monday and Wednesday from 1/13/ – 4/28/2025, (except for holidays or other events from the university that may stop the class from holding). Each lecture will begin with a SHOW/TELL session where anyone can volunteer to discuss the chapter for that week or show how they have implemented something related to that chapter. This activity counts toward the participation grade component. Please check out the course syllabus in CANVAS. Slides and other resources for the lecture are accessible from the course webpage in CANVAS. While I explore how to conform to accessibility best practices, I would appreciate your feedback and let me know if some of the materials are inaccessible. Also, I am open to learning new ways of implementing accessibility in this course and any tips are welcome.

- **Weekly readings**

There will be several book chapters to read from the recommended [book](#) and other internet resources. I encourage the student to explore all available resources that are beyond this book and what is discussed in the classroom to gain more understanding. Each class will start with a show/tell participation where one to two students discuss the book chapter for that week. Students could demonstrate knowledge gained from further readings by contributing to the discussion to earn grade points.

- **Projects**

This course consists of mini and major projects that would require students to complete individually. The course instructor will provide guides for the projects, and in some cases starter codes. Each weekly mini project is due on a Monday following the week it was published.

- Each week's project sets consist of three mini projects (project 1 will be started in the class. Projects 2 & 3 are to be completed by the student independently for that week)
- Undergrad students (CS-262) can (at minimum) choose one of the two remaining projects to complete but can also complete both. In which case, the best solution will be selected for grading
- Graduate students (CS-529) MUST complete the remaining two projects as both of them will be graded

- **Midterm and Final Evaluation**

There will be midterm and final presentations. The midterm will allow students to present their mini projects where they demonstrate their understanding of the topics covered so far until the midterm. The final presentation will focus on a major project where students will demonstrate deeper understanding of the full-stack web development skills as covered in the course. The grading for each assessment component is given below.

### Feedback and Course Grading

I will ensure that feedback is provided regularly, at midterm, and final project deliverables. Aside from the project grading, students will have the opportunity to accumulate points from the regular class participation (show/tell activities). The weighting of the grades includes:

- Class participation (20%)
  - Class attendance
  - Discussion of the weekly reading review questions
  - Show/tell (any achievements such as code implementation or deep knowledge gained which is related to the chapter for the week but not already discussed in the review questions)
- Mini projects (40%)
  - Several weekly mini projects, all must be submitted on the due date.
  - A summarized presentation of all the mini projects from weeks 1– 7 will be held during the midterm in week 8
- Major project – details to be provided in week 7 (40%):
  - CS-262: Project deliverable, presentation, and course reflection
  - CS-529: Project deliverable, presentation, course reflection, and project deployment/documentation

### Grade distribution:

- $\geq 95.00$  -> A
- 90.00 - 94.99 -> A-
- 85.00 - 89.99 -> B+
- 80.00 - 84.99 -> B
- 75.00 - 79.99 -> B-
- 60.00 - 74.99 -> C+
- 55.00 - 59.99 -> C
- $< 55.00$  -> F

### COURSE POLICIES:

- Collaboration is highly encouraged in this course both during and outside of the classroom. Students may work together to understand how to solve the homework, and other class activities.
- Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

### Late Submission and Incomplete Policy

I am adapting Professor Jed's course policy which I found very generous enough! I totally understand that as humans, things can sometimes come up or go wrong and you are unable to get an assignment turned in on time. This kind of situation calls for some flexibility where I could consider accepting a late submission. However, this flexibility **MUST** be subject to my awareness and approval. Therefore, if any student is in this kind of unfortunate situation and would need more time to submit homework or the project a bit late, please, contact me immediately. I must receive an email and reply to it in order to implement this policy. As a matter of rule, no lateness beyond 1 day (24 hours) can be tolerated for any given homework/project. In some cases, a penalty (i.e., losing a portion of the grade for a particular submission) could be applied by the instructor based on the assessment of reasons for late submission, which is solely at the instructor's discretion.

### Policy on the Use of AI and Generative AI in Web Development Class

#### *Embracing AI as a Learning Tool*

I recognize the transformative potential of Artificial Intelligence (AI) and Generative AI (GenAI) in the field of web development. As such, I encourage students to explore and utilize these technologies as supplementary learning tools. AI can be an excellent resource for:

- Explaining complex concepts
- Providing coding examples
- Offering debugging suggestions
- Recommending best practices
- Exploring new ideas and approaches

#### *Responsible Use of AI and Academic Integrity*

While I promote the use of AI for learning, it is crucial to maintain academic integrity and ensure genuine skill development. Therefore:

- Do not use AI to directly solve assignments: Assignments are designed to develop your skills and understanding. Using AI to generate solutions for assignments is strictly prohibited.
- Acknowledge AI usage: When you use AI or GenAI tools for inspiration or assistance in your work, you must clearly acknowledge this in your submissions. Include a brief note explaining how and where AI was used.
- Understand the code you submit: Ensure you fully comprehend any code or concepts you include in your work, regardless of whether AI assisted in generating them.

#### *Warning: The Perils of Over-Reliance on AI*

I strongly caution against over-reliance on AI for completing coursework. Doing so will:

- Hinder your learning: The hands-on experience of writing code, debugging, and problem-solving is irreplaceable in developing your skills.
- Impede your growth: Relying on AI to solve problems will prevent you from developing the critical thinking and problem-solving skills essential for a successful career in web development.

- Limit your creativity: Over-dependence on AI can stifle your ability to come up with innovative solutions and unique approaches to problems.
- Compromise your future career: Employers value developers who can think independently, solve complex problems, and write efficient code. These skills can only be developed through practice and personal effort.

#### *Consequences of Misuse of AI*

Misuse of AI tools, including using them to directly complete assignments without proper acknowledgment, will be treated as academic dishonesty and may result in disciplinary action.

#### **Willamette Policies:**

Cheating is defined as any form of intellectual dishonesty or misrepresentation of one's knowledge. Plagiarism, a form of cheating, consists of intentionally or unintentionally representing someone else's work as one's own. Integrity is of prime importance in a college setting, and thus cheating, plagiarism, theft, or assisting another to perform any of the previously listed acts is strictly prohibited. An instructor may impose penalties for plagiarism or cheating ranging from a grade reduction on an assignment or exam to failing the course. An instructor can also involve the Office of the Dean of the School of Computing and Information Sciences for further action. For further information, read the [School of Computing and Information Science students handbook](#).

#### **Academic Integrity**

Students of Willamette University are members of a community that values excellence and integrity in every aspect of life. As such, we expect all community members to live up to the highest standards of personal, ethical, and moral conduct. Students are expected not to engage in any type of academic or intellectually dishonest practice and are encouraged to display honesty, trust, fairness, respect, and responsibility in all they do. Plagiarism and cheating are especially offensive to the integrity of courses in which they occur and against the College community as a whole. These acts involve intellectual dishonesty, deception, and fraud, which inhibit the honest exchange of ideas. Plagiarism and cheating may be grounds for failure in the course and/or dismissal from the College. <http://willamette.edu/cla/catalog/policies/plagiarism-cheating.php>

#### **Classroom Conduct**

As an educational institution, the School of Computing and Information Sciences is committed to supporting the ideals and standards that help create a constructive and healthy learning community. That requires, among other things, encouraging positive classroom behaviors, discouraging disruptive classroom behaviors, and setting clear standards for both of those things.

Constructive classroom behaviors are those that support learners and teachers in an environment that promotes trust, respect, and collaborative learning.

Disruptive classroom behaviors are those that undermine or interfere with the abilities to learn and to teach. Clear examples of disruptive behaviors include but are not limited to: interrupting others or persistently speaking out of turn; distracting the class from the subject matter or discussion at hand; making unauthorized recordings or photos of a class meeting or discussion (except as permitted as part of an Accessible Education Services-mandated accommodations); and in extreme cases, any physical threat, physical, psychological, sexual harassment, ridicule, or abusive act towards a student, staff member, or instructor in a classroom or related setting.

#### **Commitment to Positive Sexual Ethics**

Willamette is a community committed to fostering safe, productive learning environments, and we value ethical sexual behaviors and standards. Title IX and our school policy prohibit discrimination on the basis of sex, which regards sexual misconduct — including discrimination, harassment, domestic and dating violence, sexual assault, and stalking. We understand that sexual violence can undermine students' academic success, and we encourage affected students to talk to someone about their experiences and get the support they need. Please be aware that as a mandatory reporter, I am required to report any instances you disclose to Willamette's Title IX Coordinator. If you would rather share information with a confidential employee who does not have this responsibility, please contact our confidential advocate at [confidential-advocate@willamette.edu](mailto:confidential-advocate@willamette.edu). Confidential support also can be found with SARAs at the GRAC (503-851-4245); and at WUTalk - a 24-hour telephone crisis counseling support line (503-375-5353). If you are in immediate danger, please call campus safety at 503-370-6911.

**Diversity and Disability Statement**

Willamette University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. My goal is to create a learning environment that is usable, equitable, inclusive, and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify me as soon as possible. Students with disabilities are also encouraged to contact the Accessible Education Services office in Smullin 155 at 503-370-6737 or [Accessible-info@willamette.edu](mailto:Accessible-info@willamette.edu) to discuss a range of options for removing barriers in the course, including accommodations.

**SOAR Center Offerings: Food, Clothing, and School Materials**

The Students Organizing for Access to Resources (SOAR) Center provides free, confidential, and equitable access to food, toiletries, professional clothing, textbooks, and scholarly resources for all WU and WU-affiliated students. The SOAR Center is located on the Putnam University Center's third floor. The space houses the Bearcat Pantry, Clothing Share, and First-Generation Book Drive and is maintained by committed students and advisors. Please check [www.willamette.edu/go/soar](http://www.willamette.edu/go/soar) for current hours of operation and email [soar-center@willamette.edu](mailto:soar-center@willamette.edu) for any questions or concerns.

**Land Acknowledgement**

We are gathered on the land of the Kalapuya, who today is represented by the Confederated Tribes of the Grand Ronde and the Confederated Tribes of the Siletz Indians, whose relationship with this land continues to this day. We offer gratitude for the land itself, for those who have stewarded it for generations, and for the opportunity to study, learn, work, and be in community on this land. We acknowledge that our University's history, like many others, is fundamentally tied to the first colonial developments in the Willamette Valley. Finally, we respectfully acknowledge and honor past, present, and future Indigenous students of Willamette.

**Time Commitment:**

Willamette's Credit Hour Policy holds that for every hour of class time, there is an expectation of 2-3 hours of work outside of class. Thus, for this class, you should anticipate spending 6-9 hours outside of class engaged in course-related activities. Examples include reading course materials, preparing for discussion, and doing assignments and exams.

**Intellectual Property & Privacy**

Class materials and discussions including recorded lectures are for the sole purpose of educating the students enrolled in the course. The release of such information (including but not limited to directly sharing, screen capturing, or recording content) is strictly prohibited unless the instructor states otherwise. Doing so without the permission of the instructor will be considered an Honor Code violation and may also be a violation of other state and federal laws, such as the Copyright Act.

### Tentative Course Outline:

Week	Monday	Book Chapter Readings	Wednesday	Book Chapter Reading	Important Dates
Week 1	Jan 13 Kickoff class	Ch 1 & 2	Jan 15 Intro to HTML5	Ch 3	
Week 2	Jan 20 DMLK - No class		Jan 22 HTML5 & CSS Framework (1)	Ch 4 & 5	
Week 3	Jan 27 HTML5 & CSS Framework (1)	Ch 6 & 7	Jan 29 HTML5 & CSS Framework (2)	Ch 6 & 7	Jan 27 Last day of Add/Drop
Week 4	Feb 3 Client-side Programming (JavaScript 1)	Ch 8 & 9	Feb 5 Client-side Programming (JavaScript 2)	Ch 8 & 9	
Week 5	Feb 10 Server-side Programming (PHP 1)	Ch 12	Feb 12 Server-side Programming (PHP 2)	Ch 12	
Week 6	Feb 17 Intro to Databases	Ch 14	Feb 19 Working with Databases	Ch 14	
Week 7	Feb 24 MYSQL (1)	Ch 14	Feb 26 MYSQL (2)	Ch 14	
Week 8	Mar 3 Mini project presentation		Mar 5 MYSQL with CRUD operation	Ch 14	
Week 9	Mar 10 Content Management Systems (CMS)	Ch 18	Mar 12 State Management	Ch 15	Mar 12 Last day of withdrawal
Week 10	Mar 17 Introducing PHP Framework	Documentation	Mar 19 PHP Framework	Documentation	Mar 17 Major project idea & sketch
Week 11	Mar 24 Spring Break		Mar 26 Spring Break		
Week 12	Mar 31 Dynamic website with PHP Frameworks (1)	Documentation	Apr 2 Dynamic website with PHP Frameworks (2)	Documentation	
Week 13	Apr 7 Dynamic website with PHP Frameworks (3)	Documentation	Apr 9 Dynamic website with PHP Frameworks (4)	Documentation	
Week 14	Apr 14 Web Security	Ch 16	Apr 16 Student Scholarship Recognition Day: No class		April 21 Major Project due
Week 15	Apr 21 DevOps hosting	Ch 17	Apr 23 Final project Presentation		
Week 16	Apr 28 Office visit if needed				

#### Note: \*

- Each week has homework (mini projects) that are due on a Monday evening following the week it was published
- Each project sets consist of three mini projects (project 1 will be started in the class. Projects 2 & 3 are to be completed by the student independently for that week)
- Undergrad students can (at minimum) choose one of the two remaining projects to complete but can also complete both. In which case, the best solution will be selected for grading
- Graduate students MUST complete the remaining two projects as both of them will be graded