

17-437 / 17-637: Web Application Development Spring 2025 Syllabus

(Sections A - Pittsburgh)

January 13, 2025

This course will introduce concepts in programming web application servers. At the conclusion of this course, you will understand the fundamental concepts of software engineering and how they apply to web application design and programming, will know the modern tools used to program web application servers, and will be able to produce substantial web applications as part of a team. This course will introduce web application concepts primarily using Django/Python technologies, and you will be able to generalize these concepts to other web application technologies and tools.

During the first part of the semester, we will have a series of homework assignments in which you build two increasingly sophisticated web applications. The second part of the course will focus on a larger project, in which you will design and implement a substantial dynamic web site of your choice as part of a project team. At the conclusion of your project, you will demonstrate your web site to the course staff.

1. Class Meetings

This course will have in-person lectures on Tuesdays and Thursdays from 3:30pm to 4:50pm in Scaife Hall Room 105. Even though we will make lecture recordings available to you, you are strongly encouraged to attend lectures so that you can participate in the in-class exercises and take the in-class quizzes.

Most meetings, primarily in the first half of the course, will consist of a ~60-minute lecture followed by a ~20-minute in-class exercise/quiz. The exercise/quiz is designed both to reinforce the lecture material you just heard, and to help you meet and collaborate with other students in the course.

- If you are unable to attend a lecture, **you will** be able to watch a recording later. The lecture video should be posted about two hours after class ends.
- If you are unable to attend a lecture, **you might not** be able to do the exercise/quiz, so you'll lose the opportunity to earn credit on the quiz. While some exercises/quizzes can be done after lecture, most cannot.
 - In general, we do not offer make-up quiz sessions.
 - We will offer make-up quiz sessions for students that miss lecture due to short-term medical issues or other emergencies if we are appropriately notified. (See Section 2.)
 - If there are other extenuating circumstances, things could change. (See Section 2.)

The second half of the semester will include three project-related meetings held in-person, outside class time. Project teams will be able to sign up for to meetings from a list of available times.

The Zoom link for lecture-related activities (make-up quizzes, extenuating circumstances) is:
<https://cmu.zoom.us/j/91917936136?pwd=eDg1MXR6anJjd20rT3ZUd2dMbXBadz09>

Note: You'll need to sign-in with your Andrew ID. If there are problems, we'll post on Piazza.

TAs office hours will be held in-person and/or on-line. Times and locations will be posted on the course calendar (<https://www.cmu-webapps.org/calendar>). Connection info will be posted on Piazza.

2. Logistics during Extenuating Circumstances

When we cannot hold class in-person (lecturer is sick, has an emergency, or is travelling, or the University declares an emergency, etc), we will attempt to hold class, live, via Zoom, at our scheduled class time (Tues/Thurs 3:30pm to 4:50pm), using the Zoom link shown above. If lectures are via Zoom, the quizzes/exercises will also be live, via Zoom. If live class via Zoom cannot be achieved, we will post a recorded lecture and the exercise/quiz will be done online, after you watch the recording.

If you get sick, have an emergency situation, learning accommodation, or some other extenuating circumstance, then you can notify the instructors, or student affairs or your advisor can notify the instructors (without providing details), to let us know that you cannot attend class. At our discretion, we may schedule make-up quiz/exercise sessions for you. (Watch the recorded lectures before make-up sessions.) We may reach out to the University administration to assist.

3. Prerequisites

Students will be working with a significant amount of code, so students need to have good programming skills. Ability to program in Python is assumed. (A short HW#0 will be assigned and due the first week of class to help you (and us) assess your programming skills.) For undergraduates, either 15-213 or 17-214 or 17-313 (or their various cross-listings) is required. Prerequisite courses for graduate students are not enforced, but they must have commensurate background.

Students will need a reasonably modern laptop on which to do assignments and to participate in classroom exercises/demonstrations. Laptops may be of the Windows, MacOS, or Linux variety. Students will need to install and run the Chrome and Firefox browsers as well as Git, Python and Django software, or they may develop their homework solutions on remote Linux servers.

4. Course Staff

Instructors: Jeffrey Eppinger (je0k@andrew.cmu.edu)
Terry Lee (eunsunl@andrew.cmu.edu)

Teaching Assistants:

Bing Bhakdibhumi (barameeb)	Allen Luo (yuhualuo)	Chris Oh (hyunseoo)
Nitya Bhat (nityab)	Zara Mansoor (zmansoor)	Yuna Shin (yoonahs)
Tedd Jung (tyjung)	Dorian Pan (siyupan)	Surafel Tsadik (stsadik)
Vicky Liu (ruoyuliu)	Nikhil Patel (nikhilp)	Aleks Watkins (amwatkin)

Course Mascot: Webster the Spider



5. Lecture Schedule

The expected lecture schedule, subject to change, is as follows:

Date	Lecture Topic	Date	Lecture Topic
1/14	Introduction	3/11	Software Engineering
1/16	HTML & CSS	3/13	HTTPS
1/21	JavaScript & DOM	3/18	OAuth
1/23	HTTP & Django	3/20	React
1/28	Cookies & Sessions	3/25	Transactions
1/30	Responsive Web Design	3/27	REST APIs
2/4	Forms & Templates	4/1	Scalability
2/6	Authentication	4/3	Spring Carnival (No Lecture)
2/11	Models	4/8	Internationalization
2/13	Files & Images	4/10	Testing
2/18	Midterm Exam	4/15	Demos (No Lecture)
2/20	AJAX	4/17	Demos (No Lecture)
2/25	jQuery & WebSockets	4/22	Review for Final
2/27	Cloud Deployment	4/24	Best Projects

6. Attendance /Important Dates

- You need to attend class for exercise/quiz credit (or attend the make-up session, if offered).
- You need to attend class to meet potential project teammates on 2/18/2025, 2/25/2025, and 2/27/2025 (unless you have already formed a team by then).
- You need to be in class on 2/18/2025 to take the midterm exam.
- You need to be present for your team's sprint presentations and final project presentation (aka the "demo") which are schedule outside of class meeting times. Your team will be able to choose from a list of available dates/times.
- You need to be present for the final exam. The exam schedule is usually released around mid-semester, so until the date and time of our final exam is announced, you will need to plan to stay in Pittsburgh through 5/6/2025 (which is the last day of exams).

7. Communications

- Canvas will be used to provide links to:
 - Lecture videos
 - Lecture slides
 - Code from examples shown in lecture
 - Cloud deployments of lecture examples
 - In-class quizzes
- Piazza will be used for:
 - Q&A and announcements, including office hour time/location/connection info
- GitHub will be used for homework submission (and distribution of example code)
- We will use several course websites, including:
 - <https://www.cmu-webapps.org> – provides course login support and some demos
 - <https://grader.cmu-webapps.org> – the course homework grader

8. Video (and Audio) Recordings

- **We will** post video recordings of the lectures. You can find links to the videos on Canvas.
- **You may not** live-stream or make recordings (video and/or audio) of any class meetings or exams.

9. Textbooks

This course has no required textbooks as information about the topics covered in this course is readily available on the internet, and you may search for general information. We will provide references to online resources with the lectures. (See details in Collaboration Policy Section, below.)

10. Copyrighted Course Materials and Course-related Work Products

The course materials are copyrighted (whether they are so marked or not). You may make copies of these materials for your personal use (including downloads), but you are not to publish the course materials in any way.

While you own the assignment solutions you produce for this class, you are not to share them, directly or indirectly with other students who may take this course in the future. (See details in the Collaboration Policy Section below about showing your solutions to students currently taking the course.) Therefore, you are not to make your homework solutions (or partial/intermediate solutions), course project, or quizzes publicly available. If you would like to show perspective employers your homework or course project, we suggest you put the code in a private GitHub repo, and then give access to specific interviewers.

Specifically:

- Do not give course materials or assignment solutions (or portions thereof) to others.
- Do not upload course materials or assignment solutions to websites (or systems) that would make them (or parts of them) available to others. (E.g.: Course Hero, Studocu, Chegg, etc.)
- Do not upload course materials or assignment solutions (or portions thereof) to websites (or systems) that will create derivative works. Specifically, this includes AI systems such as ChatGPT, GitHub Copilot, etc. (You may query AI systems as discussed in 14.5 below.)

11. Homework

We expect to have eight homework assignments, due weekly, during the first half of the semester. Here are some details:

- Your homework solutions will be uploaded (aka “pushed”) to GitHub.
- You will grade your own homework using our AutoGrader (<https://grader.cmu-webapps.org>). We can also submit requests to grade it, to help debug problems.
- With each homework, you may grade/re-grade your solution n times to attempt to get all the points. (The value of n will vary depending on the homework difficulty.)
- We will use your highest score for each homework.

12. Homework Grace Policy

We understand that normal student-life events, including assignments, projects, and exams in other courses, can interfere with your ability to complete your work on time. Also, you may struggle to get a high score on a homework assignment without using more than the permitted number of grading runs. Therefore, you may submit your homework after the due date (using “grace days”) and grade/re-grade your homework more than the permitted number of grading runs (using “grace runs”).

Grace Day Procedure

- The AutoGrader will let you grade and re-grade your homework after the due date.
- We will determine the submission date for each homework by using the date (Pittsburgh local time) of the first AutoGrader run that achieved your highest score for that homework.
- The number of “grace days” used will be the number of days that the submission date (defined above) is past the homework due date. (We only count whole days, so there’s no difference between being a second late or 23-hours late.)

Grace Run Procedure

- The AutoGrader will let you grade/re-grade your homework after you have used the n permitted grading runs. (The value of n will vary depending on the homework difficulty.)
- The number of “grace runs” used will be the number of grading runs past n . (The AutoGrader will display the number of grading runs you’ve used on each homework.)

Penalties

- On the homework score, itself, we will not deduct points for use of grace days or grace runs.
- If you use more than 4 grace days or more than 4 grace runs on an assignment, you should contact an instructor to discuss how to get back on track in the course.

TL;DR: You get 4 “penalty-free” grace days and 4 “penalty-free” grace runs for each homework. “Penalty-free” is in quotes. Read on to see what “penalty-free” means.

- If you use an extreme number of grace days or grace runs (e.g., more than 4 of either-type on any one homework), we may lower your course grade, particularly, if you have not contacted an instructor to discuss how to get back on track in the course.
- Students who have used any number of grace days or grace runs, will not be “rounded-up” if their course average is just below a grade boundary cut-off when determining course grades.
 - So, using up to 4 grace days and up to 4 grace runs on a homework is “penalty-free” in that we will not lower your course grade. It’s just that we will not consider raising it.
 - Actually, we don’t “round-up” anyone near a grade boundary. It’s that we would consider lowering a grade boundary for someone just below a cut-off who used no grace days and no grace runs the entire semester, which is quite a feat. (But no promises.)
 - In effect, students who use grace days and/or grace runs give up their right to complain about having the highest course average in their grade brackets.
 - Note that each homework counts for 3% of your course grade, so using a few grace days and/or grace runs to improve your score is better than turning in a disaster, in terms of the effect it will have on your course grade in the end.

13. Late Project Policy

If you are unable to demonstrate your course project at the scheduled final presentation time during “demo week”, you may discuss with an instructor the possibility of demonstrating your project the following week with a reduction in your project grade.

14. Collaboration Policy

For homework assignments:

1. **Talk/Look:** You are encouraged to talk with and share ideas with other students, including examining and critiquing others’ solutions. You must cite the Andrew IDs of every student with whom you discuss the homework assignment. (You do not need to cite trivial conversations, like “You done with the homework yet?”)
2. **Share Screens, Not Files:** You may show others your code, but do not let them have access to your files. If others have access, code may be copied, and then you’ll get into trouble. You must cite the Andrew IDs of all students whose solutions you have seen and/or who have seen your solution (or any versions or portions thereof).
3. **Copy Our Code:** You may copy into your homework solutions any sample provided to you in our course examples. You may only copy code from this semester’s examples.
4. **Don’t Copy Others:** You must independently create and turn in your own unique work. In particular, you may not copy another student’s files (or portions of files) or let another student copy your files (or portions thereof). Examining another student’s solution, as described in #1, above, so as to cause your solution to be trivially identical in a small way, is allowed, if cited.

5. **External Sources:** You may use external resources (e.g., books, internet sites, including AI systems) as references, but you may not copy files, code, or text (or substantial parts thereof) from such resources, and you must clearly cite any external resources you use. Use these sources as references to learn but write the code yourself. (E.g., this precludes systems like GitHub Copilot.)
6. **Citations:** Citations must be in a README.md file at the top-level folder of each homework assignment and project you turn in via GitHub. The first homework specification will detail what must be included in these citations.

For the course project:

- You are encouraged to collaborate with your teammate(s) and with other students for your course project, but all project deliverables must be completed by you and your teammate(s).
- You may not copy another project's documents or code for your project solution, or use substantial external code or documents obtained from any third party such as an Internet site.
- You may use publicly available frameworks and packages.
- You must cite, in the README.md file at the top of your team repo, all frameworks, packages, and external resources you used (including websites, AI tools, and people who are neither teammates nor course staff). If needed, have different lists for each team member.

Should you have any questions or concerns about this policy, ***ask an instructor.***

15. Grading

Your course grade will be computed approximately (and, likely, exactly) as follows:

- 24% Homework (3% each for HW#0-HW#7)
- 12% Quizzes (0.6% each, if we have the expected 20 quizzes)
- 12% Midterm exam
- 28% Course project
- 24% Final exam

In 17-437, a 90% average (or above) is typically an A. In 17-637, 90% is typically an A-. No promise as to where the A+/A/A- cut-offs will be for 17-637. Same story for B grades at 80%, etc. We may curve these boundaries in your favor, but this is unlikely to be needed. ("Typically?" See late homework penalties, above.)

16. Academic Integrity Violations

You should read and abide by the University Policy on Academic Integrity:

- <https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>

You should read and abide by the Collaboration Policy, in the previous section of this document.

In addition to the above, examples of academic integrity violations include:

- Coaching others step-by-step without them understanding your help.
- Making your work publicly available in a way that other students (current or future) can access your solutions, even if others' access is accidental or incidental to your goals.
- Helping someone else to copy code or written assignments (from you or other sources) that would be in violation of the course Collaboration Policy.
- Writing, using, or submitting a program that attempts to alter or erase grading information or otherwise compromise security of course resources.
- Lying to course staff.

The minimum penalty for academic integrity violations will be a lowering of your course grade, and **all** cases will be referred to the appropriate university disciplinary board. Be warned that the university disciplinary actions for cheating can be very harsh, especially in response to cheating by a graduate student. Note: There is no statute of limitations for violations of the collaboration policy; penalties may be assessed (and referred to the university disciplinary board) after you have completed the course, and some requirements of the collaboration policy (such as restrictions on posting your solutions) extend beyond your completion of the course.

17. Final Exam

Refer to Section II.5 of the university policy on exams for information on addressing final exam conflicts:

- <https://www.cmu.edu/policies/student-and-student-life/examination-policies.html>

Do not arrive more than 30 minutes late for the final exam (or the midterm). (See Section II.7 of the policy.)

18. Disability Accommodations

If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources (ODR), please contact them at access@andrew.cmu.edu.

If you have a disability and have an accommodations letter from ODR, please send the letter to the instructors in the usual fashion (using ODR's portal). Upon receipt of the letter, an instructor should contact you to discuss your accommodations and needs. Should you not hear from an instructor after sending a letter, or should you feel at any time (before or after sending a letter) that the course is not meeting your needs, please contact the instructors.

19. Well-being Statement

At the end of the day, please remember this is just class. Take care of yourself and try not to stress. We are here to have some fun. We hope you are having fun, too – at least in this class.

Recorded lectures are being made available to allow you to keep up with the course in case of illness or other absences or just so you can watch our lectures again because you'll love them so much! :-)

The homework late policy is designed to help reduce your stress. If you're so behind that you're about to cheat (or help someone else cheat), please go to sleep and talk to us in the morning (or tell someone else to do this). We'll work something out.

If you or anyone you know is experiencing academic stress, difficult life events, or feelings of anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) are available to help: call 412-268-2922 or visit their website: <http://www.cmu.edu/counseling/> Also, consider reaching out to a friend, faculty, or family member that you trust for help getting connected to the support you may need. ***And the professors are willing to talk with you, too!***

Finally, considering checking out the various Community Health and Well-Being offerings:

- <https://www.cmu.edu/wellbeing>