

17-437 / 17-637: Web Application Development

Fall 2018 Syllabus

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, but 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 an increasingly sophisticated web application. The second part of the course will focus on a larger project, in which you will design and implement a substantial dynamic web site as part of a project team. At the conclusion of your project you will demonstrate your web site to the course staff. There will be a single test: a final exam.

In the Fall semester, this course has a non-traditional format in which you will first encounter new technical content outside the classroom. Our class meetings consist of lab-like sections where you will gain hands-on experience and have the opportunity to work with your peers and receive immediate feedback from the course staff. Your participation both inside and outside of class will be critical for your success in the course.

Course topics

The course covers many topics related to the programming of web application servers, including:

- Web data protocols (HTTP, WebSockets),
- Web client programming (HTML, CSS, Bootstrap, JavaScript, jQuery, Ajax),
- Cookies and sessions,
- Databases, transaction management, ORM tools,
- Web security, concurrency, web scalability and performance, cloud services.
- Web frameworks, principles of UI design.

This course also emphasizes many software engineering practices, specifically:

- Design patterns (especially model-view-controller),
- Software design principles (including cohesion, modularity, information hiding, separation of concerns),
- Version control (Git and GitHub)
- Agile development processes (Scrum)
- Unit testing

Important dates

Homeworks typically due Thursdays at 11:59 p.m.

First homework due: 06 September 2018.

Final project presentations: 27 November - 03 December 2018.

Final exam: TBD, could be as late as Sunday night, 16 December 2018.

You must be present for the final exam. If you must schedule travel plans to return home before the exam schedule is published, do not plan to leave before 17 December 2018.

Textbooks

This course has no required textbooks, but you might find the following useful as references:

- **Mastering Django.**
 - An outdated (based mostly Django 1.8 and Django 1.11) is at <https://djangobook.com/the-django-book/>. An upcoming version (Mastering Django 2.0) might appear at <https://djangobook.com/mastering-django-2-book/>.
- **Pro Git.** Scott Chacon. Apress, 2009.
 - Free online at <http://git-scm.com/book>.
- **Software Engineering, 10th edition.** Ian Sommerville. Pearson, 2015.

Grading

Your course grade will be determined approximately as follows:

- 30% Homework
- 40% Final project
- 20% Final exam
- 10% Participation and quizzes

Your work for this course will be evaluated in part based on your demonstration of software engineering principles on the course assignments.

Late work policy

We understand that normal life events -- including projects and exams in other courses -- can interfere with your ability to complete your work on time. This course has no explicit provision for late work (such as allowing late days on a fixed number of assignments), but you may request an extension of any homework deadlines on a case-by-case basis.

To be considered for an extension you must request the extension ***before the homework deadline*** from a course TA -- not the instructor -- either in person or in a private Piazza post. Your request must be early enough such that it is reasonable to expect a TA to consider and

reply to your request before the deadline; 11 p.m. the night a homework is due is clearly not reasonable, and 9 or 10 p.m. is very late, too. It's reasonable to expect some TA to reply to a 5 p.m. private Piazza post on a day the homework is due.

Your request must include

1. an explanation of why you need the extension
2. a requested new due date

The TAs will reject any request that does not contain a reason and a specifically requested new due date. If one TA rejects your request, you may not ask another TA to consider the same (or similar) request.

The course instructor will not ordinarily consider requests for an extension; you must ask a TA. The instructor will only consider direct requests in unusual circumstances, such as if your request needs extreme privacy.

You may not request an extension for work turned in via a face-to-face meeting with course staff, such as your final project presentations. We do not accept or grade work submitted after its (extended or otherwise) deadline.

Collaboration policy

You should read and abide by the University Policy on Academic Integrity, <http://www.cmu.edu/policies/documents/Academic%20Integrity.htm>.

For homework assignments, you are encouraged to talk with and share ideas with other students, including examining and critiquing others' solutions. You must independently create and turn in your own unique work. In particular, you may not copy another student's files or let another student copy your files. You may use external resources (books, internet sites, etc.) as references, but you may not copy files or substantial parts of files from external resources, and you must clearly cite any external resources you use.

You are encouraged to collaborate with your partner and with other students for your course project. All project deliverables, however, must be completed by you and your partner. 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.

Here are some examples of behavior that are inappropriate:

- Copying (or retyping) files, parts of files (such as source code, written text, or unit tests), quiz solutions, or exam solutions from another person or source, either in draft or final form, even if the file permissions are incorrectly set to allow it. This behavior is still clearly inappropriate even if you make modifications (such as style changes or minor logic modifications) from the original source.
- Searching for or viewing a current or past student's homework solution.
- Allowing someone else to view or copy your code, written assignment, quiz, or exam, either in draft or final form.
- Getting help that you do not fully understand, or from someone whom you do not

acknowledge on your solution.

- Coaching others step-by-step without them understanding your help.
- Writing, using, or submitting a program that attempts to alter or erase grading information or otherwise compromise security of course resources.
- Lying to or otherwise attempting to deceive course staff.
- 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.

There are of course some gray areas, such as receiving help you don't fully understand or copying generic, boilerplate UI designs or configurations from the internet. In general, you should ask the instructor if you have any questions or concerns about the policy, or if you are unsure about the appropriateness of your own past or potential future actions. ***When in doubt, ask the instructor.***

The minimum penalty for violating this policy will be a zero grade for the assignment in question, and ***all*** cases will be referred to the appropriate university disciplinary board. Typical penalties for violating this policy are:

- If you fully admit all your actions related to your violation of this policy: -100% on the homework assignment in which copying occurred, regardless of whether you are the source or recipient of the copied solutions.
- If you lie about your violation of the collaboration policy: Automatically failing the course.
- If you lie to a university disciplinary board about your violation of the collaboration policy: Dismissal from the university.

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 and after your graduation.

Accommodations

If you wish to request an accommodation due to a documented disability, please inform the instructor as soon as possible and contact Disability Resources at 412.268.2013 or access@andrew.cmu.edu.

Your health matters

Take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at <http://www.cmu.edu/counseling/>. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.