

Syllabus

CMSC 210: Web page design and scripting

Spring 2024

Time: MWF 2:00pm
Room: Stevens 118
Website: <http://cs.longwood.edu/courses/cmsc210>

The class will study interactive web pages that provide customized data in response to visitor requests and/or collect data from site visitors. This interaction will be done via program scripts written in an appropriate language. Prerequisite: CMSC 140 or 160. 3 credits.

Professor: Don Blaheta
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100% office hours: Mondays and Wednesdays 3-4pm;
Fridays 11am–noon and 1–2pm

Overview

Broadly speaking, in most computer science classes you are not taught *a language* or *a technology*; the focus is on some conceptual understanding—of structured programming, or abstraction, or whatever. This course shifts that a bit. Here, we primarily focus on learning to write in the core web languages (HTML, CSS) and to program in a language and development framework designed to control them (Ruby on Rails). However, an important goal of this course is to teach not just the new languages, but *how to learn* new languages, which you should in the end be confidently able to do on your own (as you'll have to do many times over the course of your career).

Course objectives

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

- create web pages using HTML markup and CSS styling;
- display dynamic content in a web page using javascript and appropriate libraries;
- build web applications that store data to disk using files and databases using an appropriate server-side language.
- use language documentation to discover new details about a language or library; and
- learn on their own how to program for particular libraries or technologies.

You may notice that the latter two objectives are explicit about placing responsibility on the student; while one goal of the course is for the students to learn web design, another major goal—in many ways the more important one—is to learn *how to learn* a new programming language.

Textbook and resources

There is no required textbook for this course. In the past I have used Michael Hartl's *Ruby on Rails Tutorial* (currently in its 7th edition), and the course is still loosely structured to line up with that book, but it is no longer free online so I'm not requiring it. You're welcome to make use of it but I'll also be linking to other online resources.

The other main resource is provided by us: you'll be given an account on the department Linux machines (if you don't already have one), and you'll do your programming work there.

You will be expected to have a computer that can connect to the internet and various websites, and run PuTTY or another ssh client to connect to the department Linux machines.

You will need to join the CMSC slack server and the channel for this course (`#cmsc-210`), and check it somewhat regularly.

In the hopefully unlikely event that you need to go into quarantine or isolation (for Covid-19 or for some other reason), but are otherwise well enough to continue working, I'll expect that you have a device (your computer, or a phone or tablet) that is capable of connecting to a live meeting via Zoom, and reasonable bandwidth to accommodate that.

AI Policy

My general feeling about AI is this: AI is a tool. Use it when it's helpful, don't use it when you could do it better or faster yourself.

That said, there are certain skills that programmers and computer scientists will need to develop and execute without the help of AI, slightly because AI might not *always* be available but mostly because you'll need to be able to evaluate and debug the code that the AI (or other programmers) have given you. Thus for assignments that are about *developing* your programming skills (labs, homeworks, projects), I'm going to discourage use of AI until you've given a few solid attempts without. For assignments that are *assessing* your skills (exams) I'll have specific instructions on whether you are or are not allowed to use generative AI to assist. *In general* tasks that you're doing on your own time will permit use of AI, but please attend to specific instructions on each assignment.

(Note that although Longwood's Honor Code does not inherently ban the use of AI, some other professors seem to think it does, so for your safety you should check with each professor before using it in their class.)

Covid-19 notes

This section is happily much-abridged from the version I wrote in the first year(s) of the pandemic, but cases are up recently and some attention to Covid-19 is still relevant.

Attending class. There are two ways you can attend class: in person, or via Zoom link. Either mode of attendance is sufficient for purposes of evaluating your presence and participation; if you attend via Zoom link,

- you must have a reason, and
- you must say what it is,

but I don't need any medical detail and if it's not directly covid-related I'm not going to police that. (Basically: be an adult and make good choices.) The Zoom experience is nowhere near equivalent to the in-person experience and is not a replacement for it, and it's definitely harder to participate fully when remote. But if you are quarantined, or otherwise just can't attend in person on a particular day, zooming is better than total absence.

Zooming vs masking. Although we've moved from "pandemic" to "endemic" on Covid-19, I'd just like to remind everyone that masking is still a tool in our toolkit. If you have had a Covid-19 exposure, or even just feel a bit sniffly today, you're not required to zoom (and, as noted, we do prefer in-person attendance where possible) but I do encourage you to wear a mask. We all have masks, we all got really good at wearing them, and it's a courtesy to your classmates to take this easy step to decrease the likelihood of spreading anything. (Including colds and other stuff! Masks help us not spread *lots* of things.)

What if the professor gets sick? Same as for students: if I'm feeling a little sniffly, I'll wear a mask, and if I am more seriously sick (but well enough to teach), I'll zoom myself into the class. If necessary I can teach from a zoom window on the projector screen (and have done so!); I'll send an email with instructions as soon as I know I need to do this.

Homework and Projects

This course is centrally focused on the activity of learning how to work and write in new language and technologies (and learning how to learn how to do so), so the fundamental measure of assessment will be based on writing websites. There are no exams in the course; the overwhelming bulk of your grade will be based on website projects.

I figure that I have on average about 9 hours of your time every week, including class time as well as reading, practice, and your work on the homework and projects. If you find you're regularly spending substantially more time than this, please do come discuss it with me, so that we can ensure you're making the most effective use of your time.

The course is broadly divided into four main units; the first is assessed with homework assignments and the other three each correspond to a programming project:

Unit 1: Basics: HTML, CSS, JS, Ruby. Although few real sites are designed purely with HTML and CSS anymore, they remain the core language of the web and no website can be built without a working knowledge of them, and of the basics of Javascript to interact with them. In the first several weeks of the semester, we'll focus on these "Web 1.0" technologies, and on the basics of Ruby and Rails. Weekly homeworks will give you practice with them, and will collectively add up to 15% of the final course grade.

Unit 2: Ruby on Rails. Once you've got a general handle on the component tools, you'll be able to build a website that functions as a convenient front-end view for a simple (one-table) database. The project will give you practice with the Rails framework, particularly on the 'View' side of things. This project will be worth 20% of the final course grade.

Unit 3: Dynamic web. We will ramp up to a full model-view-controller (MVC) system, with REST-based user interaction, controlling data of slightly greater complexity than the previous project and giving the web user a great deal more control over it. This one will also be worth 20% of the course grade.

Unit 4: You figure it out! Having learned the basics of all these inter-related technologies, and how to work tutorials and read their documentation, and how to pick up a new technology within that framework, the rubber really hits the road on the final project, where you'll do all of that on a project of your own choosing. You'll work with a partner (or partners) to write a program that does... something... and makes substantial use of a Rails plugin or other web library or technology that was not otherwise covered in class. You will have to get your idea approved (and should do so before you start working on it), but I'm pretty open to suggestions.

During our allocated final exam period, instead of an exam, you and your partner(s) will give a demonstration of your project for the class.

The handed-in project is worth 30% of the grade; in addition, 10% of the grade is allocated to the demo presentation.

Engagement

You need to be actively engaged in this class. Engagement comes in many forms, but I expect that you will be interacting with your classmates, and with me, in class. General engagement will be evaluated in two-week blocks—so you don't need to artificially say a thing every day—and interactions on the Slack channel count. Occasional reading quizzes will also count in this category. Engagement makes up 5% of the course grade.

Grading scale

I tend to grade hard on individual assignments, but compensate for this in the final grades. The grading scale will be approximately as follows:

A–	[85, 90)	A	[90, 95)	A+	[95, 100]
B–	[70, 75)	B	[75, 80)	B+	[80, 85)
C–	[55, 60)	C	[60, 65)	C+	[65, 70)
D–	[40, 45)	D	[45, 50)	D+	[50, 55)

While there will be no “curve” in the statistical sense, I may slightly adjust the scale at the end of the term if it turns out some of the assignments were too difficult. Final grades of A+ are recorded as an A in the grading system. Final grades below the minimum for D– are recorded as an F.

Note that *individual* grades recorded in Canvas should be accurate (and you should let me know if there's a data entry error!), but *averages* as computed by Canvas sometimes are not, if the averaging is complex or (especially) if an individual student has a special case scenario. The reference gradebook is my own spreadsheet, and while I will try to make Canvas reflect it (including averages) as well as I can, Canvas can't always handle it.

Content

Wk	M	W	F
January			
1		10 Introduction Using the systems Basics of HTML	12 HTML cont'd
2	[MLK Jr Day no class]	17 CSS basics	* 19 More HTML and CSS
3	22 Javascript basics	24 Manipulating the DOM HTML + CSS + JS	26 Javascript cont'd
4	29 RoR setup Hello world	31 Scaffolding; databases	February 2 MVC, REST
5	5 Ruby	7 Ruby cont'd	9 Ruby cont'd
6	12 Test-driven development	14 Layouts in RoR	16** Custom routes Views and Dynamic CSS (SASS) <i>Project 1 out</i>
7	19 Database migration Models	21 Updating models	23 REST and persistent model data
8	26 Errors and other controller feedback	28 Index views	March 1 Routes for update and deletion <i>Project 1 due</i>

* **18 January:** Deadline to add/drop classes (5pm)

** **16 February:** Deadline to elect pass/fail option (5pm)

Wk	M	W	F
	March		
	SPRING BREAK		
9	11 Models with reference types <i>Project 2 out</i>	13 Documents and images	15 Modeling many-to-many relationships
10	18 Many-to-many cont'd	[Professor out no class]	[Professor out no class]
11	25 Sessions More complex view logic	27* Cookies and session permanence	29 Final project overview Packages and documentation
	April		
12	1 Design and planning <i>Project 2 due</i> <i>Project 3 out</i>	3 More about databases	5 Individual meetings with groups
13	8 Initial demos Resource sharing	10 TBA	12 TBA
14	15 TBA	[Research day no class]	19 Work day
15	22 Preliminary demo day	24 Preliminary demo day	26 Individual meetings with groups
	May		
	Final presentations Friday 3 May, 8–10:30		

* **27 March:** Deadline to withdraw from a class (5pm)

Policies

You can find several university-wide course policies at <http://www.longwood.edu/academicaffairs/syllabus-statements/>.

“Office hours”

If I’m in my office and my door is open, that means I’m available for you to drop in and ask questions, and I’m happy to turn on my “office hours” zoom link so you can join me that way instead. At least four hours a week I’ve designated as 100% hours, i.e. there’s a nearly 100% chance I’m available at those times.

But I’m in my office a lot and I’d like to effectively communicate to you when you’re most likely to catch me, so if you look at my office schedule on my website or linked from Canvas, you’ll also see many hours listed with other percentages like 60% or 40 or 10, as informal estimates of the probability I’ll have office hours in that block for drop-in questions. (If you want more certainty, you can always give me advance notice and be extra sure I’ll be there at whatever time!)

If you can’t catch me in my office, email or Slack is probably your best bet.

Honor code policy

Above all, I ask and expect that you will conduct yourself with honesty and integrity—and not to ignore the other ten points of the Honor Code, either. Take pride in what you are capable of, and have the humility to give credit where it is due.

The two main forms of academic dishonesty are “cheating” and “plagiarism”. “Cheating” is getting help from someplace you shouldn’t, and “plagiarism” is presenting someone else’s idea as if it’s your own. If you ever find yourself inclined towards either of these, know that there are always other, better options. Persevere! See my website¹ for some discussion and examples of how to steer clear of these problems, and feel free to come talk to me if you need help finding some of those other options (even if it’s for another course).

¹<http://cs.longwood.edu/~dblaheta/collab.html>

Cheating or plagiarism (on any assignment) will normally receive a *minimum* penalty of lowering the *course* grade by a full letter, and may range at my discretion up to an F *in the course*. Cases will also be turned in to the Honor Board. But: I believe in your potential, and I hope that you will, or will grow to, observe this policy not simply to evade punishment but positively as a matter of character.

Accommodations

If you have any special need that I can accommodate, I'm happy to do so; come speak to me early in the term so we can set things up. If you have a documented disability, you should also contact Longwood's Accessibility Resources Office (Brock Hall, x2391) to discuss some of the support the college can offer you. All such conversations are confidential.

Attendance and late policy

Attendance is required, and assignments must be turned in on time. That said, if you have a good reason to miss class or hand something in late, I tend to be fairly liberal with extensions if you ask in advance. (Good reasons do include assignments due for other classes.) (And medical and family emergencies are exempted from the "in advance" part, of course. But contact me ASAP.)

Frequent absence will result in a lowered participation grade; habitual absence may in extreme cases result in a failing grade for the class. *Unexcused* late assignments will normally be given a zero.

Inclement weather policy

I don't plan to cancel class for weather unless the entire college shuts down; and if the campus closes, I'm likely to hold class in some form by zoom instead (check your email). If you are commuting or are otherwise significantly affected by a weather event, use your own best judgement (and remember that zoom is an option); and if you do miss class for this reason (e.g.: power's out too), contact me as soon as possible to make up missed work.

Early bird policy

Nobody's perfect, and on occasion an assignment gets written a little unclearly (or, once in a while, with an actual error in it). If you catch one and bring it to my attention early, so that I can issue a clarification or correction to the rest of the class, there'll be some extra credit in it for you.