

# Course Syllabus

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## CS-5244 Fall 2021 Syllabus

**Course:** CS-5244 - Web Application Development

**Instructor:** Gregory Kulczycki (Dr. K)

**DLI:** Steven Atkinson (Dr. A)

**Graders:** TBD

**Contact:** The best way to contact us is via Piazza, as we will be checking it regularly. Note that you can post private messages in Piazza, but I suggest you keep them public if you can. Dr. K's VT PID is gregwk.

**Office Hours:** Office hours will be held by request via Zoom.

## Course Description

The course involves the study of the principles and practices surrounding Web Application Programming and Development. Topics will include Networking, Security, Encryption, Database concepts, and Distributed-Computing models. All of these topics will inform the development of a semester-long e-commerce programming project that will begin as a simple standalone application on one computer and evolve into a multi-tiered, distributed Web application backed by a database.

## Course Objectives

Upon completion of the course, students should be able to do the following:

- Develop a data-centric web application such as an e-commerce or equivalent application, that includes authentication, authorization, session handling, resource management, and user history.
- Recognize fundamental internet and web protocols such as TCP, UDP, and HTTP (including GET and POST requests), and identify the characteristics of each.
- Identify key features of client-side web technologies such as HTML, CSS, and Javascript, and use them to implement a basic web application design.
- Identify key features of server-side web technologies such as REST APIs and the DAO pattern, and use them in an application to create dynamically-generated web content.
- Discuss application security issues related to web-based, systems, including authentication, authorization, confidentiality, and data integrity.

## Course Structure

The course will be held entirely on-line. Each week, students are expected to do the following.

- Listen to the recorded lectures and tutorials

- Do the reading assignments
- Take the reading quizzes
- Work on programming assignments
- Participate in online discussions (if any)
- Complete required assessments (if any)

## Live Q&A Sessions

Live, online Q&A sessions will be held on Mondays from 8-9:30pm Eastern time. Attendance will *not* be mandatory. However, all sessions will be recorded and **students are responsible** for viewing the recordings if they cannot attend.

## Course Requirements

### Prerequisites

The prerequisites for this course are a grade of B or higher in CS5044 for MIT students. There are no prerequisites for MEng students. In general, you are expected to have a good working knowledge of the Java language upon entering the class. This includes a strong working knowledge of classes like Strings, Arrays, and the major classes in the Java collection framework. It also includes being comfortable with concepts such as inheritance, interfaces, javadocs, and unit testing.

### Texts and Online Resources

There is no primary text for this class. The texts and online sources we will be drawing significantly from are the following.

- [W3Schools.com](http://www.w3schools.com/) [\\_\(http://www.w3schools.com/\)\\_](http://www.w3schools.com/). This is a great site for learning HTML, CSS, and other web technologies. The topics are presented in small, manageable pieces and there are many exercises to let you try things yourself.
- Various readings from [O'Reilly Learning](https://learning.oreilly.com/home/) [\\_\(https://learning.oreilly.com/home/\)\\_](https://learning.oreilly.com/home/). O'Reilly Learning is a fantastic resource that you have access to as a Virginia Tech student. They have many books related to technology, including web development.
- Various videos from [LinkedIn Learning](https://www.linkedin.com/learning) [\\_\(https://www.linkedin.com/learning\)\\_](https://www.linkedin.com/learning). LinkedIn Learning (formerly Lynda.com) is another great resource that you have access to as a Virginia Tech student. It is a library of video tutorials for you to browse, mostly regarding software and how to use it, but they are continually expanding to many technology-related subjects.
- Various videos for [Vue Mastery](https://www.vuemastery.com/) [\\_\(https://www.vuemastery.com/\)\\_](https://www.vuemastery.com/). We will be using the Vue framework to help us develop our client-side code. The free videos on Vue Mastery (those that require a subscription will not be assigned) are a great resource that complements the [Vue.js web site](https://vuejs.org/) [\\_\(https://vuejs.org/\)\\_](https://vuejs.org/).

## Technology

Working and reliable computer and Internet access is required as well as access to [Canvas](#) and [Zoom](#) [\\_\(https://virginiatech.zoom.us\)\\_](https://virginiatech.zoom.us). For the programming assignments, installation of [IntelliJ IDEA Ultimate](#) is required. Occasionally you will have viewing assignments for screencasts on [LinkedIn Learning](#) [\\_\(https://www.linkedin.com/learning\)\\_](https://www.linkedin.com/learning). The [Piazza](#) [\\_\(https://piazza.com/\)\\_](https://piazza.com/) platform will be used for questions about programming assignments. Other applications may be required also for short projects. These will be specified as needed.

## Participation

Students should expect to spend about eight to ten hours per week involved in the activities and completion of assignments for this course. If exceptional circumstances prevent the timely completion of any assignment, students should contact the instructor in advance and not after the completion date has passed.

## Expectations

In the first week of class, students will be asked to sign the expectations document. It outlines the expectations of the instructor and the students in an online environment.

## Honor Code

The graded work in this class are all individual assignments, subject to the stipulations of the [Graduate Honor Code](#). However, you are highly encouraged to collaborate with your classmates and instructors, as long as it is done **entirely in public on Piazza or Canvas**, so that all students may equally share and participate in the collaboration. Do not post specific implementations or solutions that would trivialize a significant portion of any assignment. You must not use or submit any work done by any other person, including any student from this or any previous semester. If you have any questions about what is or is not allowed, please contact the instructors immediately.

Every file created and submitted by any student is subject to examination, using both manual and automated means, for potential GHC violations, and every suspected violation will be forwarded directly to the Graduate Honor System, as required by the Code.

## Assessments and Grading

The grade for this course is based on the following assessments. Both the midterm and final exams will be online. Some of the point totals are approximations and are be subject to change based on how the course progresses.

10 biweekly reading quizzes (timed, online) @ 8 points each	80 points
Midterm Exam (timed, online)	50 points
Final Exam (timed, online)	100 points
10 weekly project assignments that successively build on one another until the learner	200 points

has completed a server-based, data-centric, web application. These assignments will typically range in value from 10 to 30 points each.	
Canvas discussions, peer reviews, and other small assignments	~60 points

Grading for the course is based on the distribution of credit shown in the table. Final letter grades for the course will be determined using the following grading scale, based on the percentage of possible points achieved. Note that to get an A you must have at least 94%, not 93%.

A	≥ 94%
A-	≥ 90%
B+	≥ 87%
B	≥ 83%
B-	≥ 80%
C+	≥ 77%
C	≥ 73%
C-	≥ 70%

## Communication and Discussions

As this course is asynchronous, discussion boards will be the primary way we communicate. We will use Canvas for some types of discussion and Piazza for others.

### Piazza Discussion Boards

Piazza is really made for question-and-answer style forums. Typically assignment discussions are very active, so make sure you read these, especially if you are having difficulty with your assignment! The rules for these forums are that you can ask – and answer – general questions, but you cannot give direct solutions to questions or problems. Usually, there is no problem with this as long as you follow this simple rule: **Do not post code!**

### Canvas Discussion Boards

There will be 4 graded discussions worth 4 points each near the end of every project. When they open, you will have one week to make at least one post to the discussion. If you make a post in the time limit, you will receive 4 points; if you do not, you will receive 0 points. So make sure you post! There will be suggested topics, but you can also choose your own as long as it is relevant to the material we covered in that project. Replies to other people's posts are also considered posts.

### Netiquette

Please follow these simple rules to make online communication easier for everyone.

- If you have a question regarding an assignment, please post it to the appropriate discussion board. I will monitor these discussion boards, but if you do not get a satisfactory response there in an appropriate amount of time, feel free to email me at [gregwk@vt.edu](mailto:gregwk@vt.edu).
- Please be respectful in all correspondence in this course. In particular, refer to the [Core Rules of Netiquette](http://www.albion.com/netiquette/corerules.html) [\\_ \(http://www.albion.com/netiquette/corerules.html\)](http://www.albion.com/netiquette/corerules.html) for general guidelines of proper behavior.
- When making a post or sending an email, please sign the email with your first name (or what you prefer to be called) so that others know whom they are talking to. It is not always apparent from your email address.
- I will send out announcements through Canvas periodically. These will go to your VT email address, so make sure you monitor it.

## Course Support

### Technical Support

The instructor for this course does not provide technical support. For technical support assistance regarding any problems with Canvas, **please use the "Help" button** of Canvas that you see on the left sidebar. This will take you to the Canvas help folks, who will coordinate with VT if needed. For help with Zoom or e-mail, contact VT's 4Help center by using the [Help Request Form](http://4help.vt.edu/) [\\_ \(http://4help.vt.edu/\)](http://4help.vt.edu/) or by calling (540) 231-HELP (4357).

### Accessibility

Presentation recordings will either be captioned or scripts will be available on request. Please note that this may not apply to recorded Q&A sessions or quick video notes made by the instructor. Documents and online reading material will be in a format where copying text is available.

### Privacy

The Canvas privacy policy can be found [here](http://www.canvaslms.com/policies/privacy) [\\_ \(http://www.canvaslms.com/policies/privacy\)](http://www.canvaslms.com/policies/privacy). The Piazza privacy policy can be found [here](https://piazza.com/legal/privacy) [\\_ \(https://piazza.com/legal/privacy\)](https://piazza.com/legal/privacy). And Virginia Tech's privacy policy – for tools such as Web-CAT – can be found [here](http://www.vt.edu/about/privacy.html) [\\_ \(http://www.vt.edu/about/privacy.html\)](http://www.vt.edu/about/privacy.html).

### Accommodations for Special Needs

Any student who has been confirmed by the University as having special needs for learning must notify the instructor in the first week of the course. For more information please go to <http://www.ssd.vt.edu/> [\\_ \(http://www.ssd.vt.edu/\)](http://www.ssd.vt.edu/).

### Academic Support Services

Any student requiring academic support should investigate the University's services at <http://www.undergraduate.vt.edu/about/aca-supp/index.html> [\\_ \(http://www.undergraduate.vt.edu/about/aca-supp/index.html\)](http://www.undergraduate.vt.edu/about/aca-supp/index.html).








For complete information on student services at Virginia Tech, please see







<http://www.dsa.vt.edu/students.php> [\\_ \(http://www.dsa.vt.edu/students.php\)](http://www.dsa.vt.edu/students.php).

## Schedule

The course schedule is on the [Canvas Home Page](#) for this course. It is the best place to find out what you need to do that week and what is coming up in future weeks.

## Course Summary:

Date	Details	Due
Fri Dec 1, 2017	 <b><u>VT SPOT</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834290&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834290&amp;include_contexts=course_136000)</a>	2am to 6:59pm
Tue Jul 24, 2018	 <b><u>Web Application Development: Helping some students</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834291&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834291&amp;include_contexts=course_136000)</a>	9pm to 10pm
Thu Aug 2, 2018	 <b><u>Web Application Development - Office Hour</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834292&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834292&amp;include_contexts=course_136000)</a>	6:30pm to 7:30pm
Tue Aug 7, 2018	 <b><u>Web Application Development</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834293&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834293&amp;include_contexts=course_136000)</a>	8pm to 9pm
Fri Nov 23, 2018	 <b><u>VT SPOT</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834294&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834294&amp;include_contexts=course_136000)</a>	12:01am
Fri Nov 29, 2019	 <b><u>VT SPOT</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834289&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834289&amp;include_contexts=course_136000)</a>	12am
Fri Aug 7, 2020	 <b><u>VT SPOT</u></b> <a href="https://canvas.vt.edu/calendar?event_id=834295&amp;include_contexts=course_136000"> (https://canvas.vt.edu/calendar?event_id=834295&amp;include_contexts=course_136000)</a>	12am

Date	Details	Due
Sat Aug 7, 2021	 <b><u>VT SPOT</u></b> ( <a href="https://canvas.vt.edu/calendar?event_id=834296&amp;include_contexts=course_136000">https://canvas.vt.edu/calendar?event_id=834296&amp;include_contexts=course_136000</a> )	12am
	 <b><u>Reading Quiz 01 - Networking, HTML, Design</u></b> ( <a href="https://canvas.vt.edu/courses/136000/assignments/1270600">https://canvas.vt.edu/courses/136000/assignments/1270600</a> )	due by 11:59pm
Sun Aug 29, 2021	 <b><u>Expectations Document</u></b> ( <a href="https://canvas.vt.edu/courses/136000/assignments/1270602">https://canvas.vt.edu/courses/136000/assignments/1270602</a> )	due by 11:59pm
	 <b><u>Mini Project - Buttons</u></b> ( <a href="https://canvas.vt.edu/courses/136000/assignments/1282672">https://canvas.vt.edu/courses/136000/assignments/1282672</a> )	due by 11:59pm
	 <b><u>Web Design</u></b> ( <a href="https://canvas.vt.edu/courses/136000/assignments/1283015">https://canvas.vt.edu/courses/136000/assignments/1283015</a> )	due by 11:59pm
Sun Sep 5, 2021	 <b><u>Project Part 1 - Application Design</u></b> ( <a href="https://canvas.vt.edu/courses/136000/assignments/1270613">https://canvas.vt.edu/courses/136000/assignments/1270613</a> )	due by 11:59pm