

# Lecture 0: Introduction to the Course

## CPEN322 - Building Modern Web Applications - Term 1 2022

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Electrical and  
Computer  
Engineering



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# Instructor: Karthik Pattabiraman



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- Professor at UBC, ECE
  - PhD from UIUC (2008)
  - Post-doc at Microsoft Research (2009)
  - Faculty member at UBC (since 2010)
  - Seventh time I'm offering this course - also created it
- Research
  - Internet Of Things (IoT)
  - Security and Reliability
  - Error Resilient Systems
  - Software Engineering

# Course TAs:



- Kumseok Jung
  - PhD student
- Abraham Chan
  - PhD student
- Mohsen Salehi
  - PhD student
- Mifta Sintaha
  - Masters student

## For any question about the assignments, please ask the TAs.

- Questions about assignments and course should be asked on Piazza only
- For private matters, write a private message to “Instructors” on Piazza (NOT to specific TAs).
- No questions will be answered **48 hours** before deadline
- **No Email whatsoever - we'll ignore all email messages**
  - Except for accessibility letters - send to [karthikp@ece.ubc.ca](mailto:karthikp@ece.ubc.ca)

# What's this course about?



- **Core principles** behind building modern web applications
- Abstractions and design principles
- Application of technologies such as CSS, HTML, JavaScript, node.js to the above

# What's it not about ?



- Learning of specific technologies
  - These will most likely get outdated by the time you finish
  - Fast changing field, so new technologies tomorrow
  - Can learn any technology if you understand the principles and concepts behind web development
- Frameworks or libraries (e.g., React)
  - These are built on the principles and concepts
  - Too many to cover in a reasonable time

# Why take this course ?



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- You will understand the **principles** behind web application development
  - Not simply copy-paste code from websites to string together a web application
  - You will understand **why** technologies are the way they are, rather than accept it as a statement of fact, and perhaps change them if needed
  - It enables you to design novel techniques and technologies in the web application space
  - If you put in the effort, this course will be really fun! :-)

# Why not to take this course ?



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- You just want to write a (lot of) web code
  - Online tutorials will teach you how to do this
  - While you'll do a series of programming assignments, their focus is to teach you the principles
- You want to impress your future employer with cool-sounding buzzwords
  - There won't be many of these unfortunately
- You want an **easy** final year elective course
  - This course will require significant work. It will not be easy.

# Pre-requisites



- EECE 210 or equivalent (e.g., CPSC 210)
  - Principles of software development
  - Knowledge of invariants, specifications etc.
  - Experience using at least one OOP language (e.g., Java)
- Maturity to tackle large software development tasks
- No Web programming/JavaScript experience is needed
  - However, you should be able to pick it up quickly
  - Invest considerable time **outside** of class in learning JavaScript



# Grading



- Assignments (40%): Five programming assignments worth 8% each, building on each other.
- Exams and quizzes (50%): One Midterm (13%) and a final exam (25%); Weekly Quizzes (12%)
- Class participation (5%): Asking and answering questions on Piazza. NOTE: Quality more important than quantity.
- JavaScript Proficiency quiz (5%): Test you on the basics of JavaScript (online)

# Lectures



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- Delivered by Karthik as asynchronous videos - released every week on Tuesdays
- Weekly quizzes will test knowledge of material in the videos (due most Mondays)
- Problem solving sessions held every Tuesday and Thursday during class time (**in person**)
- Attendance is non-mandatory at synchronous sessions; but exam questions will be similar to these
- Will release both the problems and their solution on Github and Piazza, but no recordings of sessions
- Watching the videos will require 1.5 hours time outside of class every week - needed for quizzes

# Reference Books (non-mandatory)



- ① “Eloquent JavaScript: A Modern Introduction to Programming” by Marijn Haverbeke
- ② “JavaScript: The Good Parts” by Douglas Crockford (highly recommended)
- ③ “Programming JavaScript Applications: Robust Web Architecture with Node, HTML5, and Moderns JS Libraries” by Eric Elliott
- ④ “Effective JavaScript: 68 Specific Ways to Harness the Power of JavaScript” David Herman
- ⑤ “JavaScript: The Definitive Guide” by David Flanagan
- ⑥ “Secrets of the JavaScript Ninja” by John Resig, Second Edition (highly recommended)

# Assignments



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- Five Assignments where you'll build a complete web application from scratch (i.e., chat server and client)
  - Assignments build cumulatively on each other. Missing even one assignment means you'll lose big !
  - Solutions will not be provided for any of the assignments - use your own code from prev. assignments
  - To be done individually; No collaboration allowed with anyone (even for ideas)
  - Submission via Github (later) - physical presence not needed in the lab

# Exams & Quizzes



- One mid-term exam and one final exam (cumulative).  
Distribution is as follows:
  - Midterm: 13% (November 2nd)
  - Final exam: 25% (in December)
  - Quizzes almost every week: 12% (1% per quiz)

**Exams and Quizzes are open-book, open notes. But collaboration is strictly prohibited.**

**All exams will be done online on HackerRank - there's no partial grading (you need to pass all test cases for a question)**

# Piazza and Class Participation



- We will use Piazza for all course-related communication
  - Do NOT email teaching staff (unless it's an emergency or A&D related)
  - Use private posts for personal situations (to "Instructors")
  - Use appropriate tags for your posts ("Assignment", "lecture" etc.)
  - Please check Piazza at least once per day for announcements etc.
- You will receive class participation points for asking (good) questions and answering questions on Piazza
- **Class participation:** Counts for 5% of the course grade - based on Piazza. Reading Piazza posts is NOT participation.
- Complete survey of Piazza names on Canvas by Sept 20th - graded for 1 point

# Lab Information



- Labs are NOT needed, as all assignment submission and grading will be done offline (instructions later)
- You need to register for a Github account if you don't have one already (survey on Canvas) - we set up repositories
- Lab times may be used by us to ask you questions on the assignment submissions
- All questions about assignments must be asked on Piazza, NOT in Karthik's office hours
- Labs are **the only way to get one-on-one assignment help** from the TAs (in person)
  - You'll need to start the assignments early if you want to avail of this option

# Programming Proficiency Quiz



- Will test you on basics of JavaScript (Sep 20th): Self-study
  - 5 programming problems of 1 mark each - involving basic JavaScript coding
  - Needs to pass provided **all** test cases for each program. No partial credits.
  - To be taken online during the class time on Sep 20th on HackerRank platform
  - Start preparing for the test now. Will release practice test by the weekend.
  - We don't care about code quality though. Instantaneous feedback and results.
  - Your score is WYSIWG - provided you don't hard-code for test cases (you'll get 0 if so)



# Web Developer Tools & Editor

- Your favorite web browser + built-in web dev tools
  - Chrome with DevTools
  - Firebug (also include some great web development tools!)
- Node.js (latest version)
- The text editor of your choice :-)
  - **VSCode (recommended)**
  - Atom, Sublime etc.
  - Notepad++
  - Vim/Emacs
- IDEs can be used for Web Development

## Additional Tools to be installed

- Git client
- (Optional): GitHub Desktop Client for Windows/Mac
- Npm (later in the course)
- MongoDB (later in the course)

# Final Thoughts



- Do you really want to take this course ?
  - Involves significant amount of work and time
  - Easier electives are available in your final year
  - Requires spending time outside of class hours
- If you're staying, welcome on board !
  - This is the eighth time this course is being offered (seventh time I'm offering it)
  - Significant changes this time based on feedback from previous years
  - So please feel free to give us suggestions for improvement (these are actively encouraged)
  - Tell us what you liked and what you didn't like - we've incorporated past suggestions.

# To do by Next Week



## Immediate Action Items

- Complete Piazza survey on Canvas
  - Watch the recorded video and take the first quiz
  - Create Github account and share username with us on Canvas
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- If you are not familiar with JavaScript yet, start learning it asap
    - Programming proficiency quiz on Sep 20th
    - We'll post a sample quiz and solutions by the weekend
    - Create a HR account and familiarize yourself with the platform