

Course Syllabus

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SOFTWARE ENGINEERING MERN [RT25]- Course Overview

- {🔥🌐👉} => BreakOut Rooms: [Interactive ProblemSolving: MornLab Assgn.]
- 1-on-1 => (Optional) Time Designated for students to review PANIC_ZONE issues. (aka: PanicRoom)
- 💻 => Interactive Lecture: Video, CodeAlong/ LiveDemonstration (sideBySide)
- 🍔🍕🥗 => Designated Lunch Hour
- 📖 => Student Review, BONUS lectures, Homework Intro / Review
- 🎯 => Accelerated Emphasis for this Course
- 🏆🏆 => MAIN PROJECTS: [final projects/capstone projects must incorporate ideas/ ERDs based on builds that will be used for post-course portfolio development]








OFFICE HOURS -----👉-----

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| Office Hours | Josh | Minara |
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Quick Github Setup Video: https://www.youtube.com/watch?v=SWYqp7iY_Tc

CLASS BREAKDOWN-----👉-----

| Daily Schedule | | Tuesday | Wednesday | Thursday | Friday |
|-------------------|------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | 8-9am | Morning Exercise/Review | Morning Exercise/Review | Morning Exercise/Review | Morning Exercise/Review |
| * [50/10break] | 10-11am | Interactive Lecture 💻 | Interactive Lecture 💻 | Interactive Lecture 💻 | Interactive Lecture 💻 |
| | 11-12 pm | {🔥🌐👉} / 1-on-1 | {🔥🌐👉} / 1-on-1 | {🔥🌐👉} / 1-on-1 | {🔥🌐👉} / 1-on-1 |
| !! LUNCH !! | 🍔🍕🥗 | 🍔🍕🥗 | 🍔🍕🥗 | 🍔🍕🥗 | 🍔🍕🥗 |
| | 1:15 -2 pm | Interactive | Interactive Lecture 💻 | Interactive | Interactive |

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| | | Lecture  | | Lecture  | Lecture  |
| | 3pm- EOC | * - HW/Review  | * - HW/Review  | * - HW/Review  | * - HW/Review  |
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SOFTWARE ENGINEERING MERN - Course Outline

High Level Unit Overview

| Module | Ultimate Goal | Class Days |
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| Pre-Work: Programming Fundamentals | Self - paced learning in the PS Academy to be completed before the beginning of class. Topics include programming fundamentals, linux basics, Html and CSS basics. | 5 |
| Javascript & CS Concepts | After diving into the fundamentals of programming, students get comfortable with object-oriented programming, Git, advanced HTML/5 & CSS3. Students will make an ajax api request and output the data into the DOM. Students will learn some data massaging as well as ES6 syntax. | 20 |
| Front-end Frameworks | Students build SPAs and web applications built entirely with React. They will understand MVC (Model-View-Controller) and how to implement it on large scale applications. Students will make API requests using Fetch and render the data using React components. Finally, students will have an introduction to databases using Google Firebase and implement Authentication. | 20 |
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| Back-end Frameworks & Databases | Students build full-stack web applications, deepening their knowledge of client-facing and server-side development. In addition, students will explore object oriented concepts. Topics will include building full CRUD applications, token-based authentication, as well as advanced JS. Advanced JS techniques include promises, closures, & data structures, including linked lists, stacks and queues, sets, and trees. | 20 |
| Capstone Project Week | Learners will build full-stack web applications incorporating all they have learned in class. | 5 |
| Portfolio Development | Learners will fine tune their portfolios and dive into interview prep with their Career Coaches or Technical Instructor. | 5 |

| Javascript & CS Concepts Week 1 - 5 | |
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| Week/Day | Learning Objectives |
| 1.1 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Describe the role of a web developer • Describe how the web works • Define an application • Define the architecture of a web application • Identify common phases in the software development life cycle |
| 1.2 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Define what is programming • Programming Basics • JavaScript Syntax • Basic Arithmetic and Comparisons in Programming |
| 1.3 | <p>Students will be to</p> <ul style="list-style-type: none"> • Declaring Variables in Js • Getting Comfortable with Conditionals |

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| | <ul style="list-style-type: none">• Understanding the principle of Control Flow• Looping/Iteration in JavaScript• Know basic programming terminologies |
| 1.4 | <p>Students will</p> <ul style="list-style-type: none">• Describe while loops• Use while loops• Describe and identify functions• Write functions in JavaScript• Identify function calls• Differentiate between function calls and function arguments• Local Vs global scope• Block scope |
| 2.1 | <p>Students will be able to</p> <ul style="list-style-type: none">• Define data structures• Use arrays as data structures• Identify array indices• Use higher order array methods |
| 2.2 | <p>Students will be able to</p> <ul style="list-style-type: none">• Understand how to read and write basic HTML• Understand how to make basic HTML web page• Understand how to make basic edits to HTML• Learn to link and source images• Understand how to create Tables in HTML• Understand how to create lists in HTML |
| 2.3 | <p>Students will be able to</p> |

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| | <ul style="list-style-type: none"> • Understand CSS declarations • Understand Div and Spans • Id's & Classes • Learn to link External Stylesheets • CSS Box-Model • Text Customization • CSS Positioning • Intro to Flexbox |
| 2.4 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Create Navigation bars • Drop down menus • Understand forms and input tags • Understand HTML multimedia embedding |
| 3.1 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Intro to flexbox • Manipulate Web page layouts in HTML5 • Understand elements of responsive web development/design (viewport, media queries, breakpoints) • Keyframes and Animation • Grid Model |
| 3.2 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Create a grid base layout • Understand the fr unit • Intro to photoshop • Modals |
| 3.3 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Understand role of JavaScript in web development • Use JavaScript to change content of an HTML pages • Use JavaScript to manipulate elements in your HTML pages • Use JavaScript to change styles in an HTML pages |

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| 3.4 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Describe variable, basic data types, mathematical (and more) operators, expressions/statements, Boolean relationship • Create HTML buttons • Use JavaScript Display functions • Use JavaScript for HTML buttons • Learn the WCAG Web Accessibility guidelines • Web Accessibility Testing |
| 4.1 | <p>Students will learn be able to</p> <ul style="list-style-type: none"> • Identify and define functions • Identify function calls • Create input fields • Execute functions within an input field |
| 4.2 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Practice various loop statements (for loop and while loop) • Learn how to create a slideshow using CSS and JavaScript • Callback functions • Debugger |
| 4.3 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Array Advanced Methods • Object Oriented Programming • The Class and This Keywords • |
| 4.4 | <p>Students will</p> <ul style="list-style-type: none"> • Git and Github • Deploying with Github pages • Building Your First Full Project |
| 5.1 | Project Week |
| 5.2 | Project Week |
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| 5.3 | Project Week |
| 5.4 | Project Week |

Back-end Frameworks & Databases [Express] | Week 10 - 13

| Week/Day | Learning Objectives |
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| 10.1 | <ul style="list-style-type: none"> List the Fundamental Capabilities of Web Frameworks Create a Basic Express Web App Define Basic Routes Respond to HTTP Requests |
| 10.2 | <ul style="list-style-type: none"> Describe REST and list the various routes Create an Index route Install JSONView to make viewing JSON easier Create a Show route Enhance the data in your data array |
| 10.3 | <ul style="list-style-type: none"> Define MVC and explain why it matters Move our data into a separate file Move our presentation code into an JSX file |
| 10.4 | <ul style="list-style-type: none"> Explain MongoDB in the cloud Demonstrate Use Cases For Mongo DB Guided Tutorial of Mongo DB Atlas |
| 11.1 | <ul style="list-style-type: none"> Describe what an API Is Demonstrate REST API Usage Building and Deploying An API |
| 11.2 | <ul style="list-style-type: none"> Description of Full CRUD |

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| | <ul style="list-style-type: none"> • Creating, Reading, Updating and Destroying Objects using Mongoose ODM |
| 11.3 | <ul style="list-style-type: none"> • Understand how to store passwords • Implement JWT Authentication with (crypto, bcrypt and jsonwebtoken) |
| 11.4 | <ul style="list-style-type: none"> • Deploy an Api with Cloud Based Hosting Provider |
| 12.1 | <ul style="list-style-type: none"> • Build a Full Crud Frontend with React and React Hooks • Deploy Front End to Consume API |
| 12.2 | <ul style="list-style-type: none"> • Advanced NodeJS Features • Child Process • FS Module |
| 12.3 | <ul style="list-style-type: none"> • Explanation of Gulp, Webpack and Babel • Use cases for using tools in NodeJS • Deployment for NodeJS |
| 12.4 | <ul style="list-style-type: none"> • Review of the MERN Stack |
| 13.1 | Project Week |
| 13.2 | Project Week |
| 13.3 | Project Week |
| 13.4 | Project Week |
| 13.5 | Project Week |

Front-End Frameworks | Week 6 - 9


| Week/Day | Learning Objectives | Content |
|----------|---|--|
| 6.1 | <p>Students will be able</p> <ul style="list-style-type: none"> • Identify and define React • Identify and explore the Virtual DOM • Run a simple python server | <ul style="list-style-type: none"> • Integrate CSS with React |
| 6.2 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Identify States • Declare a State in a React component • Iterate over some data and render it • Identify and Define Forms • Update and Modify States • Make One Source Of Truth • Identify Events and use onChange and submit | <ul style="list-style-type: none"> • Build and prototype a receipt tracking app |
| 6.3 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Identify and Define props • Learn how to pass props • Compare and Contrast Props and States • Apply CSS Techniques • Review using className in HTML instead of class • Identify how to lift a state up from a component | <ul style="list-style-type: none"> • Analyze and explore a React APP |
| 6.4 | <p>Students will be able to</p> | <ul style="list-style-type: none"> • Use Fetch to retrieve an API |












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| | <ul style="list-style-type: none"> • Identify 3rd Party APIs and describe how they are used • Identify API keys and describe how to use them • Identify Query Parameters and apply them to 3rd Party API requests • Set up fetch for a React App • Use fetch to make API requests • Synthesize data from fetch requests into a SPA using React | |
| 7.1 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Use the Create React App • Compare and Contrast the pros and cons of Create React App • Learn how to build an app with Create React App | <ul style="list-style-type: none"> • Complete HackerRank Challenge (Link in Canvas) |
| 7.2 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Use React Router to define client-side <Route> components • Render "page" components using React Router | <ul style="list-style-type: none"> • Complete HackerRank Challenge (Link in Canvas) |
| 7.3 | <ul style="list-style-type: none"> • Use <Link> to create hyperlinks that route client-side • Access URL Parameters with React Router • Change Routes Programmatically | |












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| 7.4 | <p>Students will be able to</p> <ul style="list-style-type: none"> • Define and use React Portals • Implement Portals in a React APP | |
| 8.1 | <ul style="list-style-type: none"> • Functional Components • How to define components as functions • How to return a function component's UI defined using JSX • How to pass props to components • How to access the properties on props within a component | |
| 8.2 | <ul style="list-style-type: none"> • React Hooks Introduction • Initialize state using useState • How to pass info as props from a parent to a child component • How to map arrays of info to components • How to use function components to render info provided as props | |
| 8.3 | <ul style="list-style-type: none"> • State Management • Learn consume a third-party API in React and invoke the call to that API using the useEffect hook. • Organize State with the useState hook. | |














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| 8.4 | <ul style="list-style-type: none"> • Advanced React Methods • How to use Styled Components • How to use conditional rendering • How to use conditional styles and classNames • How to loop over and work with objects | |
| 9.1 | Project Week | Project found in Canvas |
| 9.2 | Project Week | Project found in Canvas |
| 9.3 | Project Week | |
| 9.4 | Project Week | |
| 9.5 | Project Week | |














Course Summary:


| Date | Details | Due |
|-----------------|--|----------------|
| Thu Jul 9, 2020 |  Week 3 day 4 {Callbacks} https://perscholas.instructure.com/courses/1121/assignments/207535 | due by 12:45pm |

| Date | Details | Due |
|------------------|---|----------------|
| |  Week 3 day 4 {Callbacks} (https://perscholas.instructure.com/courses/1121/assignments/207545) | due by 12:45pm |
| Sun Nov 28, 2021 |  Pre-Work Week Overview | to do: 11:59pm |
| |  HW W3 D4: Callbacks (https://perscholas.instructure.com/courses/1121/assignments/205052) | |
| |  HW W3 D4: Callbacks (https://perscholas.instructure.com/courses/1121/assignments/205054) | |
| |  HW W3 D4: Callbacks (https://perscholas.instructure.com/courses/1121/assignments/205057) | |
| |  HW W3 D4: Callbacks (https://perscholas.instructure.com/courses/1121/assignments/205061) | |
| |  MOD1 W3: HackerRank / Simple Array Sum [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205260) | |
| |  MOD1 W3: HackerRank / Simple Array Sum [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205263) | |
| |  MOD1 W3: HackerRank / Simple Array Sum [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205266) | |
| |  MOD1 W3: HackerRank / Simple Array Sum [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205269) | |
| |  MOD1 W3: Travel - Outlines [Mockup] (https://perscholas.instructure.com/courses/1121/assignments/205323) | |

| Date | Details | Due |
|------|--|-----|
| |  MOD1 W3: Travel - Outlines [Mockup] (https://perscholas.instructure.com/courses/1121/assignments/205326) | |
| |  MOD1 W3: Travel - Outlines [Mockup] (https://perscholas.instructure.com/courses/1121/assignments/205328) | |
| |  MOD1 W3: Travel - Outlines [Mockup] (https://perscholas.instructure.com/courses/1121/assignments/205337) | |
| |  MOD1 W4: HackerRank / Super Reduced String [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205358) | |
| |  MOD1 W4: HackerRank / Super Reduced String [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205363) | |
| |  MOD1 W4: HackerRank / Super Reduced String [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205369) | |
| |  MOD1 W4: HackerRank / Super Reduced String [Coding Challenge] (https://perscholas.instructure.com/courses/1121/assignments/205375) | |
| |  Roll Call Attendance (https://perscholas.instructure.com/courses/1121/assignments/205583) | |
| |  Roll Call Attendance (https://perscholas.instructure.com/courses/1121/assignments/205587) | |
| |  Roll Call Attendance (https://perscholas.instructure.com/courses/1121/assignments/205589) | |
| |  Roll Call Attendance (https://perscholas.instructure.com/courses/1121/assignments/205592) | |

| Date | Details | Due |
|------|---|-----|
| |  w1 - hw1 Copy (https://perscholas.instructure.com/courses/1121/assignments/205713) | |
| |  w1 - hw2 Copy (https://perscholas.instructure.com/courses/1121/assignments/205723) | |
| |  w1 - hw3 Copy (https://perscholas.instructure.com/courses/1121/assignments/205731) | |
| |  w1 - hw3 pt.2 Copy (https://perscholas.instructure.com/courses/1121/assignments/205740) | |
| |  w1d1 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/205598) | |
| |  w1d2 -lab Copy (https://perscholas.instructure.com/courses/1121/assignments/205610) | |
| |  w1d3 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/205654) | |
| |  w1d4 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/205698) | |
| |  w3d1 - hw Copy (https://perscholas.instructure.com/courses/1121/assignments/205899) | |
| |  w3d1 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/205987) | |
| |  w3d2 - hw Copy (https://perscholas.instructure.com/courses/1121/assignments/206078) | |
| |  w3d2 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/206100) | |
| |  w3d3 - hw Copy (https://perscholas.instructure.com/courses/1121/assignments/206142) | |

| Date | Details | Due |
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| |  w3d3 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/206175) | |
| |  w3d4 - hw Copy (https://perscholas.instructure.com/courses/1121/assignments/206225) | |
| |  w3d4 - lab Copy (https://perscholas.instructure.com/courses/1121/assignments/206234) | |
| |  warmup-Industry Reports - Governing AI [Mockup] Copy (https://perscholas.instructure.com/courses/1121/assignments/206283) | |
| |  warmup-Journalism - The Guardian [Mockup] Copy (https://perscholas.instructure.com/courses/1121/assignments/206303) | |
| |  warmup-Journalism- Nautilus [Mockup] Copy (https://perscholas.instructure.com/courses/1121/assignments/206292) | |
| |  Week 1 Day 1- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/206328) | |
| |  Week 1 Day 2- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/206378) | |
| |  Week 1 Day 3- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/206651) | |
| |  Week 1 Day 4- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/206736) | |
| |  Week 2 Day 1- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/206916) | |
| |  Week 2 Day 2- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/206981) | |
| |  Week 2 Day 3- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/207030) | |

| Date | Details | Due |
|------|---|-----|
| | <div><div></div><div>Week 2 Day 4- Lab/HW (https://perscholas.instructure.com/courses/1121/assignments/207130)</div></div> | |