

Mobile Applications for Sensing and Control

EE P 523 Sp23 M W 4:00—5:50p ECE 045

Sep Makhsous

Week 1

Teaching Team

- **Instructor:**

- **Sep Makhsous**, sosper30@uw.edu
 - **Office hours:** Sign up using the [Calendly Link](#)

- **TA:**

- **Sanskar Naik**, snaik9@uw.edu
- **Office hours:** See syllabus on Canvas

Class Time and Location

- M W 4:00—5:50p ECE 045
 - In Person Class
 - Offered via Zoom (Limited Interactions)

Course Structure

- Lecture Format:
 - Some Lecture
 - In class exercises
- Prereq
 - JavaScript
- Course Elements and grading weight:
 - Homework: 50%
 - ICTEs: 10%
 - Final Project: 40%
 - Bonus: 5%

Homework Assignments (50%)

- Individual
- 3 Homework assignments
- Due on Friday at 11:59 PM (for 5% bonus)
 - Late submissions accepted until Saturday at 11:59 PM – Full credit but no bonus

In Class Team Exercises (ICTEs) 10%

- Teams of 2
- At least 3 ICTEs overall
- Lowest ICTE will be dropped
- Due at the end of the class

Final Project 40%

- Objective:
 - The goal of this final project is to demonstrate the skills and knowledge learned in this course by developing a mobile application using React Native that integrates with native APIs and potentially external APIs.
- You pick a topic from a suggested list.
- The final project should demonstrate the ability to access native APIs and to communicate with external APIs if necessary
- Final Projects are due on June 5th at midnight

About the Class

- In this course, students will gain the practical skills necessary to develop modern mobile applications, taking advantage of many sensors and control capabilities that modern smartphones offer. Students will use React Native, an open-source framework developed by Facebook, to create native mobile apps for both iOS and Android, using a single codebase.

Learning Outcomes

- **By the end of this course, you will be able to:**
 - Apply React Native programming concepts to cross-platform mobile application development.
 - Implement dynamic graphical user interfaces for mobile apps which combine different elements and actions.
 - Access and use native features and APIs in React Native.
 - Navigate and create user interactions in React Native.

Canvas Demo

What is React Native

React.js

Web App

React.native

Real Native Apps

What is React

- React is a library for building user interfaces
- React runs on the client as a SPA(Single Page App), but can be used to build full stack apps by communicating with a server/API (eg. MERN stack)
- React is often referred to as a front-end "framework" because it is capable and directly comparable to a framework such as Angular or Vue

Why would you use React

- Structure the "view" layer of your application
- Reusable components with their own state
- JSX - Dynamic markup
- Interactive UIs with Virtual DOM
- Performance & testing
- Very popular in the industry

Before you start on React

(We will have a brief review exercise on JS)

- You should have a good handle on JavaScript.
 - I would not suggest jumping into React without learning JavaScript first
- Data types, variables, functions, loops, etc.
- Promises & asynchronous programming
- Array methods like `forEach()` & `map()`
- Fetch API & making HTTP requests

More on React

- Think of your UI as bunch of components which could be linked to other components

Task Tracker

Close

Task

Add Task

Day & Time

Add Day & Time

Set Reminder

☐

Save Task

Doctors Appointment
Feb 5th at 2:30pm

Meeting at School
Feb 6th at 1:30pm

Dinner with Mom
Feb 8th at 7:00pm

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[About](#)

More on React

- Functions vs Classes

```
export const Header = () => {  
  return (  
    <div>  
      <h1>My Header</h1>  
    </div>  
  )  
}
```

```
export default class Header extends React.Component {  
  render() {  
    return (  
      <div>  
        <h1>My Header</h1>  
      </div>  
    )  
  }  
}
```

- States

- Components can have states, like a dropdown menu - closed, opened
- We will use Hooks to define and use States

React Hooks

- React Hooks are functions that let us hook into the React state and
- lifecycle features from function components
- useState - Returns a stateful value and a function to update it
- useEffect - Perform side effects in function components
- useContext, useReducer, useRef, etc.

React Demo!

Go to: <https://codesandbox.io/>

What is React Native

React.js

Web App

React.native

Real Native Apps

React native on Mac and Windows

- Mac: iOS and Android
- Windows: Android
- Go to: <https://reactnative.dev>
 - Follow along with me. If you miss the lecture, you need to watch the recording

