

# **Programming Concepts with JavaScript – SD204**

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| **Prerequisite**: Semester 1 or Semester 1 PLAR | **Duration**: 16 weeks |
| **Course Length**: Four (4) hours per week  (2 Lecture hours plus 2 lab hours) | **Pass Criteria**: Pass or Pass Outstanding |

**Textbook/Reference Material**: React Key Components, 2022, by Maxmilian Schwarzmuller, Published by Packt Publishing Inc.

**Assessment**: Quantitative Assessment Points (QAPs) 50%

Midterm Sprint 25%

Final Sprint 25%

**Course Objectives**:

This course aims to introduce students to the critical technology and theory required for web development using JavaScript & React.

At the end of the course, students will be able to:

* Build JavaScript applications using functional programming concepts.
* Incorporate modern JavaScript frameworks such as React within JavaScript applications.
* Advanced React concepts for more robust and industry-oriented applications development.

**General Course Topics\***:

* Develop and test software that demonstrates mastery of the basic syntax of the language
* Develop and test software that implements object constructors using both ES6 classes and function-based prototypes
* Develop and test software that uses functions and methods from JavaScript standard namespaces and classes including JSON, Math, Random, Array, Map, Number, String, Set, and Object
* Write JavaScript code that uses relevant APIs to create elements, modify their attributes, and add them to an existing document
* Write asynchronous code using promises and the promise API, async, and await
* Write JavaScript code that sends requests to web servers using the fetch API
* Develop React components that utilize both HTML tags and other React components defined in JavaScript JSX files, and render into an existing web page at runtime
* Develop React components that make use of inline styling, CSS, and events in JavaScript
* Develop stateful React components using both hooks and classes
* Develop React components that use effects and lifecycle hooks/methods
* Develop automated unit tests for JavaScript and React code using Jest

**Course Layout\*:**

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| **Week #** | **Front-End Development** |
| 1 | Review of some JavaScript concepts from previous courses. |
| 2 | Some advanced JavaScript important as basis for React applications. |
| 3 | Introduction to React, components and JSX basics |
| **QAP 2** | |
| 4 | Function components and class components |
| 5 | State in class components vs hooks in function components |
| **QAP 3** | |
| 6 | useState, useEffect hooks and their implementation |
| 7 | Introduction to React Router |
| 8 | **Midterm Sprint and Midterm Break** |
| 9 |
| 10 | useLocation hooks for redirections. |
| **QAP 4** | |
| 11 | useContext hook and its use |
| 12 | Introduction to test driven development & Jest |
| **QAP 5** | |
| 13 | Unit tests, integration test and End to end testing |
| 14 | Introduction to Redux |
| 15 | **Final Sprint** |
| 16 |

**Evaluative Criteria**:

Participation in class discussions

Completion of QAPs

Midterm Sprint 1 (Weeks 8 and 9)

Final Sprint 1 (Weeks 15 and 16)

**NOTE**: Grades assigned are PASS, PASS OUTSTANDING, FAIL. To pass this course requires at least a Pass on all modules. To receive a Pass Outstanding in a module requires a mastery of skills in at least 50% of the learning outcomes for the module. A Pass Outstanding for the course is achieved when the student achieves a Pass Outstanding in all modules.

*\* General course topics and course layout are subject to change.*