



Course Code/Course Title:

FSW104-JS Back End Foundations

Course Description: The Back-End Foundations course is an introduction to creating server-side web applications and services. Students will learn how to create server-side APIs and render websites. Language-specific concepts will be covered, outlining the nuances associated with the elective framework.

Course Length:

40 hours

Prerequisites:

FSW102

Proficiency Exam

☐ Yes ☐ No

Course Start Date:

Meeting Days/Times

Course End Date:

Required Resources:

Minimum: PC (Windows) or MacBook laptop. 4GB ram, 256GB HD, Core i5

Recommended: PC (Windows) or MacBook laptop. 8GB ram, 256GB SSD, Core i5

This will become your programming rig. Every student will need their own laptop. We will be downloading programming resources to your laptop, and it will also house your coding projects.

Additional Resources:

Students are expected to supply notebooks, pens, pencils, highlighters, folders, ring binders, calculators, USB storage devices and other general supplies as needed to aid in the collection and storage of information in their courses

- A. For Classes Delivered in an Online Format (for approved courses and campuses).** Online courses are delivered via <https://wozu.exeterlms.com> in an asynchronous format. Students enrolled in online courses/programs are expected to spend an equivalent amount of time on task, as campus-based students, in meeting course objectives. For Online Courses the total expected hours required for completion of course objectives are identified on the syllabus as **Total Contact Hours** and reflect the sum of theory, laboratory, and outside hours.

Educational Objectives:

Upon successful completion of this Program, students will be able to:

1. Learn the basics of the request/response cycle
2. Learn how to render HTML in response to a request
3. Learn how to render JSON or XML in response to a request
4. Understand how to build a REST endpoint
5. Learn how to interface with a database system from a web application

Course Outline

Lessons:

Week 1

1. **Introduction to Backend Foundations with JavaScript:** Includes Why Backend, Node, Express, setup, Nodemon, Postman, Exploring the Starter App, Using Handlebars to Loop, Loop Through an Array, Loop Through an Array of Objects
2. **HTTP Request and Response:** Includes HTTP Request Lifecycle, HTTP Verbs, HTTP Verbs with Postman, Request and Response Objects, Defining Parameters in URL, Checking Against an Array, Using req.body, Handling Forms, Response Codes, Viewing JSON, Viewing HTML, Viewing XML
3. **Routing:** Includes Models, Views, Controllers, Routing, Basic Routing, add data, req.url(), app.js File Walkthrough

Week 2

4. **Using SQL with Express:** Includes using a Database, SQLite in Express, setup, Performing Queries, Queries Within Routes, Query Id from Database, Prepared Statements in SQLite, Using a Form
5. **Sequelize:** Includes Sequelize, Using Sequelize, Models, Migrations, test database, Running Queries, Query Based on ID, Query Based on Operators, Post to the Database, Provide Data to Front-End
6. **RESTful:** Includes RESTful APIs, RESTful Best Practices, Full CRUD with Sequelize and RESTful APIs, walkthrough

Week 3

7. **Authorization and Authentication Basics:** Includes Authentication vs. Authorization, Differences, User Sign up and Login, Passport, Authenticate Users
8. **Advanced Auth:** Includes JSON Web Tokens, Using JWT, Logout with JWT, Bcrypt, Using Bcrypt, OAuth, Using Github OAuth
9. **Front-End Integration:** Includes working with a React Application, and working with an Angular Application
10. **Final Project**

Outline:

- **L1 Practice Hands On:** You will be rendering the information provided by using Handlebars and the res.render() method.
- **L2 Practice Hands On:** Create an array of flowers and use a GET method to check and respond accordingly depending on the flower. If the flower is not added, add the flower with a message or if already have will respond with proper message.
- **L3 Hands On:** For this project, you will be displaying a story using three views. Using a GET for each method link all parts of the story line together in the proper order to create the final story. Use handlebars to display the data.
- **L4 Practice Hands On:** Create an Express web application that returns data from the database based on the route provided in the URL.
- **L5 Hands On:** Create a new database in SQLectron and connect it to the music database. Within the playlist file you can view the playlist name currently. Create a new column for number of tracks and have both playlist name and number of tracks display on your page as well as an area to add a new playlist.

- **L6 Hands On:** Create an employee directory which will allow you to view employee's information. To view their information, you can click on the employee and are able to delete if needed. Make sure each employee has a route based on their id and an update() method is used to update the column to true when deleted.
- **L7 Hands On:** Create a table of users and have columns with their information
- **L8 Practice Hands On:** Create a new column, Admin, and place into the users table. Change a user to true in the Admin column so when they sign in using JWT their Admin status is added to the token. Use the token to check if the user is an Admin or Normal user.
- **L9 Practice Hands On:** Currently, you can use the static data from the Express side and render them onto the page from your Front-End app. Now, you are going to render the same data, but from a database.
- **L10 Final Project:** Final Project

Final Project:

Using JavaScript and Node, create a full Back-End application that has two tables, users and posts. Create a sign in form that allows users to create, edit, and delete. Users should be able to view their profile page, while admins should be able to see a list of all users. Admins should be able to delete users and their posts, but not edit them.