

## ITMD 444 SYLLABUS

### ITMD 444 Back-End Development

Hours: 3 credit hours / 45 contact hours

Instructor: Brian Bailly

Textbook, title, author, and year: [Getting MEAN with Mongo, Express, Angular, and Node 2nd Edition](#). Holmes, Simon and Harber, Clive. 2019

#### Specific course information

- a. **Catalog description:** This course emphasizes back-end, server-side components of web application development. It provides broad coverage of server-side data stores and languages, and surveys multiple leading server-side web development frameworks.
- b. **Prerequisites:** ITMD 321 AND ITMD 442

#### Specific goals for the course

- a. **Course Outcomes:**  
Students learn to interact with back-end portion of web application development. This includes deploying standard back-end frameworks and deploying opensource datastores. The class will cover a single back-end development framework and focus on deploying a complete working web application
- b. **Course student outcomes:**
  - Explain the client and server architecture of the Internet and related web technologies.
  - Compare standard open source application back-end frameworks
  - Deploy a standard open source application back-end framework
  - Deploy back-end systems to communicate with frontends via APIs
  - Explain the benefits of using API layers for communication with datastores
  - Explain the benefits of full-stack development
  - Compare relational and non-relational (NoSQL) datastores fitness for deployment in applications
  - Implement and describe security concerns for back-end frameworks
  - Explain back-end security concerns and common security mitigation strategies

- Describe the role of HTTP and HTTPS in the context of web applications
- Evaluate back-end authentication standards
- Develop a web application that validates data inputs on the client- and server-side as appropriate
- Describe various frameworks, open source applications and their use cases
- Evaluate the design and architecture of a web system, including issues such as design patterns, layers, tradeoffs between redundancy and scalability, state and management
- Use version control tools to work with a team on a web development
- Use industry-standard tools and technologies for web development

#### Topics to be covered

- a. Introductions / Syllabus Review / Overview
- b. Introduction to commandline tooling and version control (Git)
- c. Introducing Node.js and Express
- d. Introducing MongoDB
- e. Discussing common MEAN Architectures
- f. Designing a flexible MEAN Architectures
- g. Setting up MEAN projects
- h. Defining Express routes
- i. Using Mongoose with MongoDB
- j. Exposing MongoDB via the application API
- k. Managing User Authentication
- l. Advanced Topics