ITMD 442 Syllabus

ITMD 442 Full-Stack Development

Hours: 3 credit hours / 45 contact hours

Instructor: Karl Stolley

Textbook, title, author, and year:

a. *Agile Development with Rails 7*. Ruby, S. with D. Thomas, 2022.

Specific course information:

a. Catalog description: This course covers the fundamental concepts and techniques of full-stack web development, focusing on server-delivered front-end content such as server-rendered HTML or JSON and its integration with back-end architectures and data stores.
b. **Prerequisites:** ITMD 441.
c. **Required.**

Specific goals for the course

a. **Course Outcomes:**
   Students completing this course will learn to:
   - Understand the connections between MVC architecture and full-stack web development
   - Leverage an object-relational mapper (ORM) for data-driven application design and database-neutral implementation
   - Become conversant with documentation and release notes in order to properly implement and stay current with ongoing development to a full-stack web framework
   - Evaluate the design and architecture of a web or mobile system, including issues such as design patterns (including MVC), layers, tradeoffs between redundancy and scalability, state management, and search engine optimization.

c. **Course student outcomes:**
   At the conclusion of this course, successful students will be able to:
   - Analyze specific computing problems of information storage and dissemination, and articulate their requirements and appropriate solution in object-oriented languages
   - Design, implement, and evaluate a Ruby on Rails web application that meets specific, desired user needs
   - Understand and articulate how full-stack frameworks adhere, or fail to adhere, to open standards for networking and the web
   - Read and interpret documentation and release notes for languages, libraries, and frameworks, and adjust professional practice based on the contents of that material
   - Describe how authentication, secure certificates, and secure communication can be used in web sessions.

Topics to be covered:

a. Ruby Fundamentals
b. Ruby on Rails Fundamentals
c. The Structure of Full-Stack Web Applications
d. The Structure of Application Data
e. Models
f. Unit Testing
g. Controllers
h. Functional Testing
i. Views
j. Integration and Regression Testing
k. Session Data and Users
l. Third-Party Integrations (OAuth)
m. Continuous Integration/Continuous Deployment
n. Refactoring
o. Tuning for Performance: Compression, Minifications