

ITMD 415 SYLLABUS

ITMD 415 Advanced Software Programming

Hours: 3 credit hours / 45 contact hours

Instructor: Scott Spyrison

Textbook, title, author, and year:

Java EE 8 Recipes A Problem-Solution Approach, Josh Juneau, 2018

The Java EE 8 Tutorial. Oracle Corporation, 2017
<https://javaee.github.io/tutorial/toc.html>

Specific course information

- a. **Catalog description:** Contemporary open-source programming languages and frameworks are presented. The student considers design and development topics in system, graphical user interface, network, and web programming. Dynamic scripting languages are covered using object-oriented, concurrent, and functional programming paradigms. Concepts gained throughout the course are reinforced with numerous exercises which will culminate in an open-source programming project.
- b. **Prerequisites:** ITMD 411

Specific goals for the course

- a. **Course Outcome:** At the completion of the course, each student will have designed, produced, and documented projects using the Java EE platform, culminating in a comprehensive and multi-tiered final project that builds cumulatively on prior work. Students will have deployed enterprise applications to modern application server environments. Students will have demonstrated knowledge of Java EE specifications, APIs, architectures and techniques, including security, database persistence, business components, web services and presentation components.
- b. **Course Student Outcomes:**
Upon successful completion of the course the student should be able to do the following:
 - Write, Use and administer modern Java EE application server
 - Explain the benefits and best practices associated with multi-tier/multi-layer enterprise applications
 - ♦ Persistence Layer (a.k.a. Information or Database Tier)
 - ♦ Business and/or Service Layer (a.k.a. Business Tier)
 - ♦ Presentation Layer (a.k.a. Web Tier)

- Describe the concepts of Declarative Programming, Inversion of Control and Configuration by Exception, and correlate these concepts with CDI and other Java EE specifications
- Explain the use of design patterns within the Java EE platform
- Describe the origins, benefits and weaknesses of JSP and JSTL technology
- Create JSP and JSTL pages consisting of several standard tags
- Produce Servlet code to process HTTP requests
- Differentiate between JDBC and JPA
- Implement Java code that uses common JPA annotations and JPA Query Language
- Use associations and inheritance to demonstrate Object-Relational Mapping
- Create business components with EJB technology and expose related web services
- Create web service producers based on EJB business components
- Differentiate between EL, JSF, JSP, JSTL and Servlet technologies
- Produce MVC web applications
- Explain how JSF relates to the MVC architecture
- Differentiate between authentication and authorization as security mechanisms
- Contrast Java EE with other modern frameworks
- Explain the benefits of Platform as a Service

Topics to be covered

- a. Introduction and Setup N/A
- b. Platform Basics (Git, Maven, Junit), JDBC and Validation
- c. Introduction to Web Applications with Servlet and JSP
- d. ORM/JPA I
- e. ORM/JPA II
- f. ORM/JPA III
- g. EJB/Service Layer
- h. Web Application Security/JSF I
- i. Web Application Security/JSF II
- j. JSF/MVC (Putting it all together) I
- k. JSF/MVC (Putting it all together) II
- l. Web Services/MVC or JSF/MVC