ITMD 515 Advanced Software Programming **Scott Spyrison**
Fall 2024 **Adjunct Industry Associate Professor**

Professor: **Scott Spyrison**
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Course Catalog Description: This course considers Web container application development for enterprise systems. The primary focus is on database connectivity (JDBC) integration with Web application programming using an enterprise-level application framework. A Web application term project considers the design and implementation of a database instance that serves as the information tier in a contemporary 3-tier enterprise solution.
Prerequisites: ITMD 510 **Credit:** 3-0-3 Semester Hours

Lecture Day, Time & Place: Online. Recorded lectures will be posted to Canvas every Monday. You are required to watch the recorded lecture.

Schedule of Topics/Readings: ***All readings should be done prior to class. *Check Canvas weekly for updated reading.***

	Date	Topic	Read by this Day	Due on this Day
1	Aug 19	Introduction and Setup	Juneau Intro (*)	
2	Aug 26	JDBC and Validation	Juneau 5,10 (*)	Lab 1
	Aug 31	Last Day to Add/Drop		
3	Sep 2	Labor Day – No Classes		Lab 2
4	Sep 9	MVC with Servlet and JSP	Juneau 1 (*)	
5	Sep 16	ORM/JPA	Juneau 6,9 (*)	Lab 3
6	Sep 23	ORM/JPA	Juneau 6,9 (*)	Lab 4
7	Sep 30	ORM/JPA	Juneau 6,9 (*)	Lab 5
8	Oct 7	Fall Break Day / Midterm Review		
9	Oct 14	EJB/Service Layer and APIs	Juneau 8,13 (*)	Midterm (due Oct 14)
	Oct 18	Midterm Grades Due		
10	Oct 21	Introduction to JSF	Juneau 2,3 (*)	Lab 6
11	Oct 28	Web Application Security	Juneau 15 (*) Tutorial 50,51,53	Lab 7
	Oct 28	Last day to Withdraw		
12	Nov 4	JSF (Putting it all together)	Juneau 2,3 (*)	Lab 8
13	Nov 11	JSF (Putting it all together)	Juneau 2,3 (*)	Lab 9
14	Nov 18	JSF (Putting it all together)	Juneau 2,3 (*)	Lab 10
15	Nov 25	TBD or Final Project Consultations		
	Dec 1	Last Day to Request Incomplete		
16	Dec 2	Final Exam/Project Week		Final Project (due Dec 7)
	Dec 11	Final Grades Due at Noon		

Course Outcomes: At the completion of the course, each student will have designed, produced, and documented projects using the Jakarta 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 Jakarta EE specifications, APIs, architectures and techniques, including security, database persistence, business components, web services and presentation components.

Course Student Outcomes: Students completing this course will be able to:
- Use and administer modern Jakarta 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 Jakarta EE specifications
- Explain the use of design patterns within the Jakarta 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 Jakarta EE with other modern frameworks
- Explain the benefits of Platform as a Service

Required Textbooks:

- Juneau, Josh Jakarta EE Recipes A Problem-Solution Approach, Apress 2020; ISBN 978-1-4842-5586-5. (Cited in readings as Juneau. Available from Books 24x7, IIT Galvin Library)
- The Jakarta EE Tutorial. (Cited in readings as Tutorial. Available online https://eclipse-ee4j.github.io/jakartaee-tutorial/
- Online readings as assigned in Canvas
- We may also supplement with material from the Oracle Academy and RedHat Academy programs.

Readings: Readings for the class will be assigned from the textbooks; there will be additional reading assigned in the form of online reading. All readings should be done before coming to class on the assigned date, and are mandatory and expected. Generally if you do the readings you will excel in the course, as the lectures serve as a clarification and explanation of material you should already be familiar with. Completion of reading may be verified by quizzes. Specific readings are assigned by topic above.

Course Notes: Copies of the course lecture notes in the form of a PDF of the PowerPoint presentations accompanying each lecture will be provided for each student on Canvas. You should be aware that note taking is encouraged and should help your understanding of the material.

Attendance: This class is being taught online. It is your responsibility to watch the recorded lectures, and to submit work on time. I do not take attendance. You are responsible for all material whether you attend live or watch the recordings.

Course Web Site: Canvas (accessed via https://portal.iit.edu/)

Canvas: The course will make intensive use of Canvas (accessed via https://portal.iit.edu/) for communications, assignment submissions, group project coordination, providing online resources and administering examinations. All remote students will view the course lectures online via Canvas, and online readings and other course material will be found on Canvas.

Assignments: There will be labs collected regularly. These labs make up a significant portion of your grade.

Project/Examination: In addition to the labs, there will be a written Midterm and Final Project. The midterm is take-home in short essay format. The Final Project builds on all your prior lab work. The labs are milestones toward Final Project completion

Quizzes: I may give quizzes at my discretion and may use them for verification that you have completed assigned reading. As they are discretionary, the weight of quizzes in grading is also left to my discretion and will be included in your class participation grade. Quizzes may be online via Canvas.

Grading: Grading criteria for ITMD 515 students in the graduate curriculum will be as follows:

A	*Outstanding work reflecting substantial effort*	90-100%
B	*Adequate work fully meeting that expected of a graduate student*	80-89.99%
C	*Weak but marginally satisfactory work not fully meeting expectations*	65-79.99%
E	*Unsatisfactory work*	0-64.99%

The final grade for the class will be calculated as follows:

Labs (25 points each * 10)	**50% (250)**
Midterm	**15% (75)**
Final Project	**20% (100)**
Class Participation	**15% (75)**
Total	**100% (500)**

Late Submission: A penalty of up to 10% *may* be assessed at instructor discretion.

Academic Honesty: All work you submit in this course **must be your own.**

Plagiarism: You must fully attribute **all** material directly quoted in papers and you must document all sources used in the preparation of the paper using complete, APA-style bibliographic entries. Including directly quoted material in an assignment without attribution or a bibliography entry for the source of the material is always plagiarism and will always be treated as such by me. No more than thirty-three percent of material included in any paper may be direct quotes. Students have submitted plagiarized material in seven of the last eight times I have taught this course and **I will not tolerate it**. If you submit plagiarized material you **WILL** receive a grade of **ZERO** for the assignment or exam question, an Academic Honesty Violation Report will be filed, and it may result in your expulsion from the course with a failing grade as per the IIT and ITM academic honesty policies. **There is no excuse for not understanding this policy** and if you do not understand it please let me know and I will be happy to discuss it with you until you do.

Collaboration: Students may only collaborate on assignments or projects that are explicitly designated as group assignments or projects. Students submitting work that is identical or in some cases even substantively the same will be asked to discuss the assignment with me. If one student admits to having copied the work, or if there is clear evidence who is guilty, the guilty student will be assigned a grade of zero. If no one admits to the offense or a reasonable determination of guilt cannot be made, each student involved will be assigned a grade of zero. In either case, an Academic Honesty Violation Report will be filed, and it may result in your expulsion from the course with a failing grade as per the IIT and ITM academic honesty policies.

Our Contract: This syllabus is my contract with you as to what I will deliver and what I expect from you. If I change the syllabus, I will issue a revised version of the syllabus; the latest version will always be available on Canvas. Revisions to readings and assignments will be communicated via Canvas.

Disabilities: Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. My office hours are listed on the first page of the syllabus. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312 567.5744 or disabilities@iit.edu.

Illinois Tech Sexual Harassment and Discrimination Information: Illinois Tech prohibits all sexual harassment, sexual misconduct, and gender discrimination by any member of our community. This includes harassment among students, staff, or faculty. Sexual harassment of a student by a faculty member or sexual harassment of an employee by a supervisor is particularly serious. Such conduct may easily create an intimidating, hostile, or offensive environment.

Illinois Tech encourages anyone experiencing sexual harassment or sexual misconduct to speak with the Office of Title IX Compliance for information on support options and the resolution process.

You can report sexual harassment electronically at iit.edu/incidentreport, which may be completed anonymously. You may additionally report by contacting the Title IX Coordinator, Virginia Foster at foster@iit.edu or the Deputy Title IX Coordinator, Esther Espeland at eespeland@iit.edu.

For confidential support, you may reach Illinois Tech's Confidential Advisor at (773) 907-1062. You can also contact a licensed practitioner in Illinois Tech's Student Health and Wellness Center at student.health@iit.edu or (312)567-7550

For a comprehensive list of resources regarding counseling services, medical assistance, legal assistance and visa and immigration services, you can visit the **Office of Title IX Compliance** website at https://www.iit.edu/title-ix/resources.