Program Content

Semester	IV		
Course Code:	IT4206		
Course Name:	Enterprise Application Development		
Credit Value:	4 (3L + 1P)		
Core/Optional	Core		
Hourly Breakdown	Theory	Practical	Independent Learning
	45 hrs.	30 hrs.	125 hrs.

Course Aim:

- This course will develop a proper understanding about the concepts of enterprise application development and encourage the students to develop a high performing, scalable and secure enterprise application with JavaEE.

Intended Learning Outcomes:

After following this course, students should be able to

- Explain the enterprice application and the architecture of an enterprice application.
- Apply design considerations with respect to enterprise application development.
- Design and develop Java enterpeise applications which sutes to the enterpeise requirements.

Course Content: (Main Topics, Sub topics)

Topic	Theory (Hrs)	Practical (Hrs.)
1. Introduction to Enterprise Application Development	01	--
2. Remote Method Invocation	04	02
3. Component Based Application Development	02	02
4. Overview of JEE	03	--
5. Enterprise Java Beans	07	06
6. Object Relational Mapping with the Java Persistence API	08	06
7. Servlet Development and Deployment	06	04
8. JSON Processing	04	04
9. Web Services	04	04
10. Web Socket	03	02
11. Comparative Study on EJB specifications	03	--
Total	**45**	**30**

1. **Introduction to Enterprise Application Development (1 hour)**
   1.1. Enterprise Application Development [Ref: Teacher's Note]
   1.2. Component based architecture [Ref 6 : Pg. (3-10)]

2. **Remote Method Invocation (4 hours)**
   2.1. Describing remote method invocation [Ref 3]
   2.2. Parsing behavior of remote method invocation [Ref 3]
   2.3. Using RMI API to establish client and server communications [Ref 4]

3. **Component Based Application Development (2 hours)**
   3.1. Enterprise applications [Ref 1: Pg. (2-4)]
   3.2. Multi-tiered application architecture [Ref 1: Pg. (9-13)]
   3.3. Deploying an application [Ref 1: Pg. (18-21)]

4. **Overview of JEE (3 hours)**
   4.1. Describing an application server [Ref 1: Pg. (30-38)]
   4.2. Packaging and deploying a Java EE application [Ref 1: Pg. (38-42)]

5. **Enterprise Java Beans (7 hours)**
   5.1. Describing Enterprise Java Beans [Ref 1: Pg. (58-60)]
   5.2. Describing Stateful beans, Stateless beans, Message passing beans, Singalton beans, Entity beans. [Ref 5]
   5.3. Deployment descriptors and deploying a Java Bean [Ref 7, Teacher's Note]
   5.4. Generate an EJB [Ref 1: Pg. (61-63)]
   5.5. Converting a Plain Old Java Object(POJO) to an EJB [Ref 1: Pg. (63-65)]

6. **Object Relational Mapping with the Java Persistence API (8 hours)**
   6.1. Object relational mapping concepts [Ref 1: Pg. (74-75)]
   6.2. Entity class and annotations [Ref 1: Pg. (75-79)]
   6.3. Use EntityManager in an EJB [Ref 1: Pg. (79-81)]
   6.4. Persisting Data [Ref 1: Pg. (84-90)]
   6.5. Creating Queries [Ref 1: Pg. (91-105)]
   6.6. Relationship between entities [Ref 1: Pg. (114-119)]
   6.7. Tunning the performance of loading relationship data [Ref 1: Pg. (119-122)]

7. **Servlet Development and Deployment (6 hours)**
   7.1. Client Server architecture and web servers. [Ref 8: Pg. (3-5)]
   7.2. HTML and HTTP. [Ref 8: Pg. (6-19)]
   7.3. What is a servlet? [Ref 2: Pg. (358-361)]
   7.4. Processing HTML forms [Ref 2: Pg. (363-368)]
   7.5. Servlet life cycle. [Ref 8: Pg. (93-106)]
   7.6. Request forwarding and response redirection [Ref 2: Pg. (369-380)]
   7.7. Servlet listeners [Ref 2: Pg. (384-386)]

8. **JSON Processing (4 hours)** [Ref 2: Pg. (216-241)]
   - 8.1. Generating JSON data with the Model API [Ref 2: Pg. (216-220)]
   - 8.2. Parsing JSON data with the Model API [Ref 1: Pg. (221-223)]
   - 8.3. Generating JSON data with the Streaming API [Ref 1: Pg. (225-227)]
   - 8.4. Parsing JSON data with the Streaming API [Ref 1: Pg. (228-231)]

9. **Web Services (4 hours)**
   - 9.1. Web Services [Ref 1: Pg. (134-136)]
   - 9.2. Restfull web services [Ref 1: Pg. (139-146)]

10. **Web Socket (3 hours)**
    - 10.1. Developing a WebSocket server endpoint [Ref 2: Pg. (243-245)]
    - 10.2. Developing WebSocket clients [Ref 2: Pg. (247-254)]

11. **Comparative Study on EJB specifications (3 hours)**
    - 11.1. Session beans [Ref 2: Pg. (146-162)]
    - 11.2. Enterprise JavaBean life cycles [Ref 2: Pg. (171-182)]

Teaching /Learning Methods:

You can access all learning materials and this syllabus in the VLE: http://vle.bit.lk/, if you are a registered student of the BIT degree program.

Assessment Strategy:

Continuous Assessments/Assignments:

The assignments consist of two quizzes, assignment quiz 1 (It covers the first half of the syllabus) and assignment quiz 2 (It covers the second half of the syllabus). The maximum mark for a question is 10 and the minimum mark for a question is 0 (irrespective of negative scores). The final assignment mark is calculated considering both assignments. To pass the online assignment component, students will have to obtain at least 40% for each assignment. Students are advised to complete online assignments before the given deadline. It is compulsory to pass the online assignment component to qualify to obtain the Level II Higher Diploma in IT (HDIT) certificate.

In the course, case studies/Lab sheets will be introduced, and students have to participate in the learning activities.

Final Exam:

Final examination of the course will be held at the end of the semester. The course is evaluated using a two hour question paper which consists of 25 MCQ (1 hour) and 2 Structured Questions (1 hour).

References/ Reading Materials:

- **Ref 1.** Red hat training+ certificate STUDENT WORKBOOK EAP 7.0 JB083x FUNDAMENTALS OF JAVA EE DEVELOPMENT Edition 1
- **Ref 2.** Java EE 8 Application Development, 2017
- **Ref 3.** https://www.oracle.com/java/technologies/javase/remote-method-invocation-distributed-computing.html
- **Ref 4.** https://www.oracle.com/java/technologies/jpl1-remote-method-invocation.html
- **Ref 5.** https://docs.oracle.com/cd/E19798-01/821-1841/6nmq2cp3a/index.html
- **Ref 6.** Kathy Sierra, Bert Bates - Head First EJB - O'Reilly Media (2003)
- **Ref 7.** https://docs.oracle.com/cd/E19226-01/820-7627/bncbj/index.html
- **Ref 8.** O'Reilly Head First Servlets and JSP