

Pre-Requisite Modules code(s)	Co-Requisite Modules code(s)	ECTS credits	Module Code	Module Title
		5	CMPU4023	Enterprise Application Development

8.9.4. Enterprise Application Development

Module author: Dr. Michael Collins

Module Description:

This module shows how to architect enterprise applications and how to use enterprise-level Java technologies to develop very sophisticated applications. Core design fundamentals such as concurrency, scalability and redundancy will be taught to students and how to incorporate these and other important factors in a multi-tiered web application.

Module aim:

The aim of this module is to:

- Teach the student how to design and develop sophisticated enterprise applications using several Java related technologies.
- Teach correct enterprise application design principles and how to incorporate these in developing a web application.
- To provide the student with sufficient knowledge in recognising common problems in web applications.
- Teach the student how to incorporate persistent data in a multi-tiered enterprise application model.

Learning Outcomes:

On completion of this module, the student will be able to:

- a) Design and develop sophisticated enterprise applications using a variety of Java related technologies.
- b) Incorporate efficient design principles in the development of a complex web application.
- c) Distinguish the need for specific components in order to implement a design.
- d) Implement a sophisticated Graphical User Interface (GUI) of a web application using enterprise-level Java components that are independent of the server-side technologies.
- e) Maintain state in a sophisticated application.
- f) Incorporate authentication in a multi-tiered application.
- g) Implement session tracking using a variety of techniques and be able to select the most appropriate method based on the design.

Learning and Teaching Methods:

This module will teach how to design and develop sophisticated enterprise applications using a mixture of theory and practical work. Lectures will be used to deliver the theoretical material to the student and will include sample code to show the student how the material is implemented. References, documentation and other resources will also be provided to supplement all material

Pre-Requisite Modules code(s)	Co-Requisite Modules code(s)	ECTS credits	Module Code	Module Title
		5	CMPU4023	Enterprise Application Development

delivered. It will be expected that the student conducts self-study outside of normal contact hours to complement this.

Due to the strong practical nature of this module, a large emphasis will be placed on the development of web applications in the laboratory. Each week, the student will be given a practical exercise based on material delivered in their lecture. This will compliment their overall understanding in the respective area.

Module content:

The content of the module will include:

- **Java Servlets:** Review of Servlet APIs, processing HTTP requests, HTTP Authentication with Servlets, Session management, using cookies with Servlets, using the Session API, Database management with Servlets and JDBC, comparing Servlets with other server-side technologies.
- **JavaServer Faces:** Introduction to JSF, What is JSF, JSF Features, How JSF fits for web applications, the JSF Architecture and design pattern, JSF Components, JSF Tags, JSF validation process, JSF lifecycle.
- **Enterprise Architectures:** The Model-View-Controller (MVC) design pattern, the role of Enterprise JavaBeans (EJB) in web application development. Java Persistence API in web application development. Setting up an Application Server, establishing a connection to a database.

Module Assessment:

Assessment of the module will be as follows:

- Written examination: 70%
- Continuous assessment: 30%

Essential Reading: (author, date, title, publisher)

Hunter and Crawford, 2001, Java Servlet Programming, 2nd Edition, O'Reilly

Larry Brown, Marty Hall, 2006, Core Servlets and JavaServer Pages, 2nd Edition/Volume II, Prentice Hall

Hans Bergsten, 2006, JavaServer Faces, 3rd Edition, O'Reilly

Ian F. Darwin, Jason Brittain, 2003, Tomcat: The Definitive Guide, 1st Edition, O'Reilly and Associates

Vlada Matena and Beth Stearns, 2000, Applying Enterprise JavaBeans, 1st Edition, Prentice Hall.

Supplemental Reading: (author, date, title, publisher)

Bruce Perry, 2004, Java Servlet and JSP Cookbook, 1st Edition, O'Reilly and Associates

<i>Pre-Requisite Modules code(s)</i>	Co-Requisite Modules code(s)	ECTS credits	Module Code	Module Title
		5	CMPU4023	Enterprise Application Development

Web references, journals and other:

World-Wide-Web Consortium <http://www.w3.org/>

Oracle – Java <http://www.oracle.com/technetwork/java/index.html>

Apache Group <http://jakarta.apache.org>

Further Details:

The module will be delivered over one semester. Contact hours are:

4 contact hours per week:

Lectures: (2 hours)

Practical (Lab) work: (2 hours)

Date of Academic Council approval