

COURSE SPECIFICATION DOCUMENT

Academic Department: Science, Innovation & Technology

Programme: Computer Science

FHEQ Level: 6

Course Title: Web Application Development

Course Code: COMP 6103

Total Hours 160

Timetabled Hours: 45

Guided Learning Hours: 15

Independent Learning Hours: 100

Credits:

16 UK CATS credits

8 ECTS credits

4 US credits

Course Description:

This course focuses on developing modern web applications using a popular web framework and a lightweight database engine. Students will learn the fundamental concepts of back-end web development, including model-view-controller (MVC) design patterns, database modelling, URL routing, form handling, and user authentication. Additionally, students will gain hands-on experience with a lightweight database solution and the integration of front-end technologies with the back-end framework's templating system. Emphasis will also be placed on deployment, security, and performance optimization. By the end of the course, students will be able to create, deploy, and maintain scalable web applications. [?]

Prerequisites:

70 credits + COMP 4101 Introduction to Programming

Aims and Objectives:

By the end of this course, students will:

- Understand the principles of web application development using a modern web framework and a lightweight database engine.
- Develop proficiency in building scalable and secure back-end web applications.
- Model databases and manage data using an object-relational mapping (ORM) tool.
- Deploy and manage applications on cloud platforms or on-premises servers.
- Integrate front-end technologies with the back-end framework's templating system.

Programme Outcomes:

L6 AI, II, BI, BIII, CII, DII, III

A detailed list of programme outcomes can be found in the Programme Specification available through the Registry at: <https://www.richmond.ac.uk/programme-and-course-specifications/>

Learning Outcomes:

By the end of this course, successful students should be able to:

- Design and develop web applications using a modern programming language, framework, and database engine.
- Use an object-relational mapping (ORM) tool to model relational databases and query data.
- Understand the model-view-controller (MVC) or model-view-template (MVT) architecture for building dynamic web applications.
- Manage user authentication, session handling, and form validation in web development frameworks.
- Integrate a lightweight database engine for web applications and understand its advantages and limitations.
- Deploy web applications to production environments
- Apply security best practices, including managing user data, securing APIs, and preventing common vulnerabilities like SQL injection.

Indicative Content:

- Programming for Web Development
- Understanding a Web Framework
- Setting up a Lightweight Database for Web Applications
- Understanding the MVC/MVT (Model-View-Controller/Template) Design Pattern
- URL Routing and Views in Web Frameworks
- Database Models and Object-Relational Mapping (ORM)
- Form Handling and Validation in Web Applications
- User Authentication and Authorization in Web Frameworks
- Integrating Front-End Technologies (HTML, CSS, JavaScript) with Back-End Frameworks
- Deploying Web Applications with a Lightweight Database
- Security and Performance Optimization for Web Applications

Assessment:

The assessment strategy for this course will conform to the University Assessment Norms as approved by the Academic Board.

Details on assessment criteria can be found at: <https://www.richmond.ac.uk/university-policies/>

Teaching Methodology:

This course will be delivered face to face through a combination of lectures and interactive sessions. In addition to classroom activities, there are guided learning elements that are tutor led and arranged through Blackboard. These activities can be asynchronous online sessions, flipped classrooms, set readings with discussion boards or set guest lectures for example. Set activities are monitored by the instructor to ascertain student engagement. Students are encouraged to prepare for class and to play an active part, to raise questions, following-up ideas and interact with a wide range of provided material.

