**SCHEME OF WORK**

***UNIT 30: APPLICATION DEVELOPMENT***

**Learning outcomes (BTEC, globalization):**

* **LO1**: Produce a Software Design Document by analyzing a business-related problem and deduce an appropriate solution including a set of initial requirements.
* **LO2**: Use design and development methodologies with tools and techniques associated with the creation of a business application.
* **LO3**: Work individually and as part of a team to plan and produce a functional business application with support documentation.
* **LO4**: Evaluate the performance of a business application against its Software Design Document and initial requirements.

**Objectives (FGW, localization):**

* Use modeling tools such as use case diagram, screen flow diagram, requirement process to capture and analyze solution requirements.
* Use object oriented models and tools to design the solution.
* Explain different design and development methodologies and tools.
* Implement a secured web-based application with MVC approach.
* Critically evaluate a business application.
* Produce user guide and technical document.

**F2G Syllabus:**

| Sessions | Learning Outcome(s) | Session Activities |
| --- | --- | --- |
| Session 1,2 | LO1  Topic: Software Requirement Concepts | Theory:   * Introduction to the unit content and unit assessment. * Requirement concepts and requirement modeling * Modeling tools   Practice:   * Investigate real-world scenario to identify problem requirements * Draw use case diagram for the requirements |
| Session 3,4 | LO1  Topic: User Interface Design | Theory:   * Screen flow diagram. * Interaction Flow Modeling Language (IFML)   Activity:   * Answer user interface design problems |
| Session 5,6 | LO1  Topic: Requirement Process | Theory:   * Requirement process * Requirement clarifying * Common practices, problems   Practice:   * Create Q&A sheet to clarify requirement. |
| Session 7,8 | LO1, LO2  Topic: Object Oriented Analysis and Design | Theory:   * General Introduction to OOAD * Object modeling technique * Three models * Four phases   Practice:   * Draw class and sequence diagrams |
| Session 9,10 | LO1, L02  Introduction to Assignment 1 | Theory:   * Explain assignment requirements * Instruct to do the assignment   Practice:   * Carry on assignment: analyse application requirements |
| Session 11,12 | LO2  Topic: Unified Modeling Language (UML) | Theory:   * UML concepts * Simple analysis/design UML diagrams   Practice:   * Carry on assignment 1: design application functions |
| Session 13,14 | LO2  Topic: Object Oriented Design in Practice | Theory:   * Software design principles * Simple design pattern in the common situations   Practice:   * Carry on assignment 1: design application functions |
| Session 15,16 | LO2  Topic: Design Process | Theory:   * Design process * Design workflow * Design document   Practice:   * Review of student progress on the unit assignment |
| Session 17,18 | LO1, LO2  Topic: Workshop on Assignment 1 | Practice:   * Application development workshop with tutor support to introduce different design and development methodologies. * Discuss, select or synthesize a design and development methodology for use with the creation of your application |
| Session 19,20 | LO3  Topic: Introduction to ASP .NET MVC | Theory:   * MVC patterns * Introduction to ASP. NET MVC Framework * Razor Engine   Practice:   * Review and submit assignment 1 |
| Session 21,22 | LO3  Topic: Creating APS.NET MVC application | Theory:   * ASP.NET MVC project * Controller * URL Routing * View * Model   Practice:   * Create sample MVC project |
| Session 23,24 | LO3  Topic: Adding Search & Validation | Theory:   * Search * Data validation   Practice:   * Continue sample MVC project |
| Session 25,26 | LO3  Introduction to Assignment 2 | Theory:   * Explain assignment requirements * Instruct to do the assignment   Practice:   * Carry on assignment: create MVC project and with basic CRUD entities |
| Session 27,28 | LO3  Topic: Lambda Expression & LINQ | Theory:   * Lambda Expressions * LINQ   Practice:   * Continue assignment 2 |
| Session 29,30 | LO3  Topic: Entity Framework Code First | Theory:   * Entity Framework and ORMs * EF Code First * Configuration and Data Annotation * Migration   Practice:   * Continue assignment 2 * Research MVC frameworks |
| Session 31,32 | LO3  Topic: Authentication and Authorization | Theory:   * Implementing Authentication * ASP.NET Identity * Authorization Process   Practice:   * Continue assignment 2 * Research MVC frameworks |
| Session 33,34 | LO3  Topic: ASP.NET Web API | Theory:   * ASP.NET Web API * Web API Controllers   Practice:   * Review assignment 2 |
| Session 35,36 | LO3  Topic: Workshop on Assignment 2 | Practice:   * Application development workshop with tutor support to introduce different MVC frameworks to develop * Discuss, select or synthesize development methodology for use with the creation of student’s application |
| Session 37,38 | LO4  Code demo | Practice:   * 10-15 minutes each student (can do in parallel), present program, answer questions, fix/modify code (if needed) |
| Session 39,40 | LO1, LO2, LO3, LO4  Student Presentation | Practice:   * 5 minutes each student present: problem-design-implementation-result |

**Bridge Syllabus:**

| Sessions | Learning Outcome(s) | Session Activities |
| --- | --- | --- |
| Session 1,2 | LO1  Topic: Software Requirement Concepts | Theory:   * Introduction to the unit content and unit assessment. * Requirement concepts and requirement modeling * Modeling tools   Practice:   * Investigate real-world scenario to identify problem requirements * Draw use case diagram for the requirements |
| Session 3,4 | LO1, LO2  Topic: Object Oriented Analysis and Design | Theory:   * General Introduction to OOAD * Object modeling technique * Three models * Four phases   Practice:   * Draw class and sequence diagrams |
| Session 5,6 | LO1, L02  Introduction to Assignment 1 | Theory:   * Explain assignment requirements * Instruct to do the assignment   Practice:   * Carry on assignment: analyse application requirements |
| Session 7,8 | LO2  Topic: Unified Modeling Language (UML) | Theory:   * UML concepts * Simple analysis/design UML diagrams   Practice:   * Carry on assignment 1: design application functions |
| Session 9,10 | LO1, LO2  Topic: Workshop on Assignment 1 | Practice:   * Review of student progress on the unit assignment * Application development workshop with tutor support to introduce different design and development methodologies. * Discuss, select or synthesize a design and development methodology for use with the creation of your application |
| Session 11,12 | LO3  Topic: Introduction to ASP .NET MVC | Theory:   * MVC patterns * Introduction to ASP. NET MVC Framework * Razor Engine   Practice:   * Review and submit assignment 1 |
| Session 13,14 | LO3  Topic: Creating APS.NET MVC application | Theory:   * ASP.NET MVC project * Controller * URL Routing * View * Model   Practice:   * Create sample MVC project |
| Session 15,16 | LO3  Introduction to Assignment 2 | Theory:   * Explain assignment requirements * Instruct to do the assignment   Practice:   * Carry on assignment: create MVC project and with basic CRUD entities |
| Session 17 | LO3  Topic: Authentication and Authorization | Theory:   * Implementing Authentication * ASP.NET Identity * Authorization Process   Practice:   * Continue assignment 2 * Research MVC frameworks |
| Session 18 | LO3  Topic: ASP.NET Web API | Theory:   * ASP.NET Web API * Web API Controllers   Practice:   * Review assignment 2 |
| Session 19 | LO3, LO4  Topic: Workshop on Assignment 2  Code demo | Practice:   * Application development workshop with tutor support to introduce different MVC frameworks to develop * Discuss, select or synthesize development methodology for use with the creation of student’s application * 10-15 minutes each student (can do in parallel), present program, answer questions, fix/modify code (if needed) |
| Session 20 | LO1, LO2, LO3, LO4  Student Presentation | Practice:   * 5 minutes each student present: problem-design-implementation-result |