Module Specification

Data, Schemas and Applications

Version: 2025-26, v6.0, Approved

Contents

Part 1: Information

Module title: Data, Schemas and Applications

Module code: UFCFV4-30-2

Level: Level 5

For implementation from: 2025-26

UWE credit rating: 30

ECTS credit rating: 15

College: College of Arts, Technology and Environment

School: CATE School of Computing and Creative Technologies

Partner institutions: None

Field: Computer Science and Creative Technologies

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The module covers data modelling, manipulation, and presentation across structured and unstructured formats, integrating web services, scripting, and secure web application development.

Features: Not applicable

Educational aims: In addition to the learning outcomes, the educational experience may explore, develop, and practise but not formally discretely assess the following:

Team working and the delegation of responsibility;

Self-study of programming and data manipulation languages.

Outline syllabus: Background. The need to store, transform, locate and present data of many forms (numeric, textual, relational, graphical, visual and auditory). Unstructured text through semi-structured networks to homogeneous relational and non-relational structures. Application areas such as personal, corporate, public and collaborative data bases.

Data Schemas. Separation/Composition of data, schema (including constraints) and meta data and namespaces. Languages for describing schemas - UML models and SQL DDL for tables, data structure diagrams and XML Schema for hierarchical structures. Composition, types and sub-types and inheritance. Data schemas for typical problems.

Data Manipulation. Standard SQL for relational database management systems (RDBMS) such as MySQL for creation, retrieval, updating and deletion operations. XSLT for XML transformation and JavaScript/PHP for DOM manipulation .

Web service and communication standards. Application Programming Interfaces (APIs). RSS,ATOM and XML/JSON generating web services. Representational Sate Transfer (REST). Using data from external services and analysing, reformatting and re-presenting this data. Metadata design, generation and use in the context of the Semantic Web using RDF and SPARQL.

Scripting technologies and presentation. Fundamental principles of software architecture. Server-side processing with PHP including functional programming and MySQL/XML data manipulation. Client side processing with JavaScript and JSON.

Documentation, technical design and security. Documenting schemas, data structures and interactions. Documenting code including APIs. Optimisation techniques. Testing code and applications, according to standards, to ensure

resilience. Common data input and web application vulnerabilities. Using source code repositories and version management.

Part 3: Teaching and learning methods

Teaching and learning methods: Scheduled learning - includes lectures and tutorials. Tutorials will consist of worksheet exercises, use of custom-built online tutor tools and supervised group work on the assignment.

Independent learning – students are expected to undertake preparatory reading related to the weekly topics and to continue the usage of online tutors between contact sessions. Additional work on the group assignment is expected outside of scheduled tutorials.

Contact time: 72 hours

Assimilation and development of knowledge: 148 hours

Exam preparation: 40 hours

Coursework preparation: 40 hours

Total study time: 300 hours

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Derive well-structured and workable schemas from unstructured and qualitative data, capturing domain entities, their attributes and constraints and the relationships between them.

MO2 Understand the basis of building and using ER modelling to design and implement Relational and NoSQL Databases.

MO3 Perform accurate create, read, update and delete (CRUD) operations on a range of different data structures.

MO4 Effectively use web standards and APIs for the retrieval and representation of data to derive meaningful and useful structure (form) and information (content) from a variety of web services.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ufcfv4-30-2.html

Part 4: Assessment

Assessment strategy: Assessment is designed to test theoretical and analytical data skills with group and individual components to evaluate the students' ability to implement data schemas and to retrieve, manipulate and present data.

The assessment will cover aspects of:

Deriving entity models or schema from qualitative data;

Suggesting/evaluating possible technical approaches to a data design or management problem;

Being able to name and define architectural components in a data management application;

Identifying security, management or performance issues in a data management scenario and suggesting improvements or enhancements.

Weekly material presented in lectures and tutorial worksheets will provide the technical basis for the assessment. Substantial tutor input and support will be provided to groups attending tutorial workshops on assignment preparation.

The resit strategy is the same as for the first sit.

Assessment tasks:

Set Exercise (First Sit)

Description: Data modelling, integration and presentation task with group and individual inputs.

Weighting: 100 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO2, MO3, MO4

Set Exercise (Resit)

Description: Data modelling, integration and presentation task with group and individual inputs.

Weighting: 100 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Business Computing {Foundation} [Frenchay] BSc (Hons) 2023-24

Software Engineering for Business {Foundation} [Frenchay] BSc (Hons) 2023-24

Business Computing [Frenchay] - WITHDRAWN BSc (Hons) 2024-25

Software Engineering for Business [Frenchay] BSc (Hons) 2024-25

Information Technology Management for Business [Frenchay] - WITHDRAWN BSc (Hons) 2024-25

Business Computing [Frenchay] BSc (Hons) 2024-25

Business Computing {Foundation} [GCET] BSc (Hons) 2023-24

Business Computing {Foundation} [GCET] BSc (Hons) 2023-24

Business Computing {Foundation} [Frenchay] BSc (Hons) 2023-24

Software Engineering for Business {JEP} [Neusoft] BSc (Hons) 2023-24

Software Engineering for Business [Frenchay] BSc (Hons) 2024-25

Software Engineering for Business {Foundation} [Frenchay] BSc (Hons) 2023-24

Business Computing {Foundation} [GCET] BSc (Hons) 2023-24

Business Computing {Foundation} [GCET] DipHE 2023-24