Module Specification

Fundamentals of Data Science

Version: 2022-23, v1.0, 16 Mar 2022

Contents

Part 1: Information

Module title: Fundamentals of Data Science

Module code: UFCFK1-15-0

Level: Level 3

For implementation from: 2022-23

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Computer Sci & Creative Tech

Partner institutions: The British College Nepal

Delivery locations: The British College Nepal

Field: Computer Science and Creative Technologies

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module covers the basics of Python programming including concepts common to all programming languages, as well as some specific to Python itself. This also includes database concepts, design and querying of data.

Features: Not applicable

Educational aims: This module aims to teach students:

The fundamental concepts of computer programming using Python

Typical content would include variables and data types

Understanding sequence, selection and Iteration

Basic algorithms

Structured programming and reuse.

Concepts of database design and queries.

Outline syllabus: The syllabus covers:

Installation of Python language and IDE

Python Native Data-Types

Python Operators

Python Data Structures (List/ Dictionary/ Sets/ Frozen set

String Formatting in Python

Python Conditionals

Python Iteration

Python Functions

File Handling in Python

Database Concepts and Design

Introduction to SQL

Part 3: Teaching and learning methods

Teaching and learning methods: Lecture: In person, Blended Learning, Tutorials, Seminars, Online Lectures.

Lectures will be used to introduce much of the material, with example demos being used as part of the module. There will be a range of lab exercises in the computer lab designed to reinforce the theory and develop skills across the development lifecycle. A range of additional resources will be made available via the TBC VLE e.g. short quizzes, further exercises etc.

Students will be introduced to using an integrated development environment (IDE) of Python3.

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

> **MO1** Demonstrate an understanding of the key concepts of procedural type programming, including sequence, selection and iteration along with the use of variables and data types.

> **MO2** Write functioning computer programs written using a third-generation programming language, which takes input, performs processing, then generates output.

> **MO3** Select appropriate software tools used to carry out computer programming activities, and have the ability to use these tools to develop, debug and execute program code.

> **MO4** Design and implement a basic database.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 102 hours

Face-to-face learning = 48 hours

Total = 150

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://rl.talis.com/3/uwe/lists/F03A15FD-F853-31A7-0863-70B45A7CA96A.html?lang=en-GB&login=1

Part 4: Assessment

Assessment strategy: The assessment strategy for this module is based on a requirement for students to achieve all the learning outcomes and to be competent and confident in database work using the programming language Python which is taught throughout the semester.

Component A (40%) - Portfolio of programming work

Component A comprises Portfolio One which covers the key concepts of programming and is assessed partway through the teaching programme when that learning has been delivered. The aim of this division in the assessment is to provide formative feedback before assessing MO2, MO3 and MO4 at the end of the semester.

Component B (60%) - Practical skills assessment of programming work and demonstration of database design

Students are required to develop a programmatic solution, using the python programming language and to design and implement a basic database, to meet the specified requirements as provided by the module tutor. The database specification will be based on a number of requirements to be completed as part of the solution in Component A and Component B. i.e. the students will be working on a single

database. Students will be required to demonstrate the work they have submitted to their tutor as part of the assessment. If the students do not provide a demonstration, they will be referred in Component B. The demonstration is an example of authentic assessment as the students are required to explain their work and answer questions.

Resit Strategy

Component A : Students are required to rework those parts of their portfolio in which they failed to meet the original requirements. This will entail reworking the programming task(s) to the original specification and providing a written commentary in the portfolio on the changes made and why.

Component B: Students are required to rework their database design and implementation to meet the component specification. They must demonstrate their work to the assessor, explaining their improvements with regard to their first sit (if submitted) and to answer assessor questions.

Assessment components:

Portfolio - Component A (First Sit)
Description: Portfolio based on programmatic work.

Students are required to fulfill three requirements based on the requirements designed by the module tutor. The student will demonstrate their work during timetabled lab.
Weighting: 40 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1

Practical Skills Assessment - Component B (First Sit)
Description: Portfolio based on programmatic work.

Students are required to fulfill additional four requirements (60 marks) based on the

requirements designed by the module tutor. Students will demonstrate will their programmatic work in their timetabled lab.

Weighting: 60 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Portfolio - Component A (Resit)

Description: Students are required to rework those parts of their portfolio in which they failed to meet the original requirements. This will entail reworking the programming task(s) to the original specification and providing a written commentary in the portfolio on the changes made and why.

Weighting: 40 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

Practical Skills Assessment - Component B (Resit)

Description: Students are required to rework their database design and implementation to meet the component specification. They must demonstrate their work to the assessor, explaining their improvements with regard to their first sit (if submitted) and to answer assessor questions.

Weighting: 60 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

International Foundation (Computing) [NepalBrit] FdCert 2022-23