



Module Specification

Communications and Protocols

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Part 1: Information

Module title: Communications and Protocols

Module code: UFCFVR-15-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Computer Sci & Creative Tech

Partner institutions: None

Field: Computer Science and Creative Technologies

Module type: Module

Pre-requisites: Internet of Things 2021-22, Operating Systems 2021-22

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module covers digital communications and protocol design from the perspective of a physical computing system. The module assumes some basic knowledge of microcontroller peripherals and an awareness of the Open Systems Interconnection (OSI) model of communications.

Pre-requisites: students must take one out of UFCFVK-15-2 Internet of Things or UFCWK-15-2 Operating Systems

Features: Not applicable

Educational aims: Using a practical approach, this module aims to develop a deep knowledge and understanding of computer communications and protocols.

Outline syllabus: In this module you will cover the following areas:

Microprocessor Communications:

- Low-Level Peripherals Revisited
- External Modems & Sensors
- State Machine Design for Communications
- Radio & LPWAN

Media Access Control (MAC) Design & Implementation:

- Protocol Design
- Error Detection & Correction

Resource consumption and performance impact of protocol design:

- Performance Analysis
- Design Optimisation & Trade-offs

Part 3: Teaching and learning methods

Teaching and learning methods: The teaching of this module is practically led with several workshops that will focus on the design and implementation of protocols for different transmission mediums. Through tutor-led session and peer support students will build upon foundational knowledge to develop and evaluate protocols for modern microprocessors.

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

- MO1** Devise methods of optimising the performance of communications protocols in different computational environments.

MO2 Evaluate the performance of different protocols and their impact on system design.

MO3 Produce diagrams that describe the structure of various protocols.

MO4 Design and implement aspects of a protocol and justify design choices in relation to theoretical concepts.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 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/AAA72DA9-A0CC-1C46-25B8-83A8CD8D54D9.html?lang=en-GB&login=1>

Part 4: Assessment

Assessment strategy: During the lab sessions, students will be presented with a series of worksheets. They will work through the tasks on the worksheets and receive formative feedback in the process.

For the summative assessment, students will demonstrate and discuss their solutions to the graded problems in the worksheets. The sign off sheet will be handed in as evidence of their work.

Students will also be assessed in their effective use and understanding of the tools and technologies that they utilise.

The resit strategy involves a re-working of the main sit.

Assessment tasks:

Practical Skills Assessment (First Sit)

Description: Demonstration and sign-off of a series of worksheets.

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested:

Project (First Sit)

Description: Small group project with functional demonstration and signoff.

Weighting: 35 %

Final assessment: No

Group work: Yes

Learning outcomes tested:

Presentation (First Sit)

Description: Small group presentation that reflects on aspects of, for example, the project process, outcomes and management.

Weighting: 15 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested:

Practical Skills Assessment (Resit)

Description: Demonstration and sign-off of a series of worksheets.

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested:

Project (Resit)

Description: Small group project with functional demonstration and signoff

Weighting: 35 %

Final assessment: No

Group work: Yes

Learning outcomes tested:

Presentation (Resit)

Description: Small group presentation that reflects on aspects of, for example, the project process, outcomes and management.

Weighting: 15 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Computer Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Computer Science [Sep][FT][Villa][3yrs] BSc (Hons) 2021-22

Computer Science [Jan][FT][Villa][3yrs] BSc (Hons) 2021-22

Computer Science [May][FT][Villa][3yrs] BSc (Hons) 2021-22

Computer Science {Foundation}[Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21

Computer Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21