



## **Module Specification**

### Wireless and Mobile Communications

Version: 2021-22, v3.0, 26 Apr 2022

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## **Part 1: Information**

**Module title:** Wireless and Mobile Communications

**Module code:** UFMF9D-15-M

**Level:** Level 7

**For implementation from:** 2021-22

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Engineering Design & Mathematics

**Partner institutions:** None

**Delivery locations:** Frenchay Campus, Northshore College of Business and Technology

**Field:** Engineering, Design and Mathematics

**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:** Not applicable

**Features:** Not applicable

**Educational aims:** See Learning Outcomes

In addition, the educational experience may explore, develop, and practise but not formally assess the following:

Problem formulation and decision making.

Self-management and project management skills.

**Outline syllabus:** The syllabus includes:

#### INFORMATION THEORY:

Transmission of information, Shannon's Law and its applications.

#### CELLULAR PRINCIPLES:

The cellular concept, Typical cell operation, System capacity, Frequency re-use distance, Determination of cell radius, Sectoring, Properties of the radio channel, Space wave propagation, Short-term fading (fast fading).

#### MOBILE COMMUNICATION SYSTEMS:

Global System Mobile Communication (GSM), GSM radio interface, Mapping of logical channels in GSM, GSM modulation, coding and error protection, Handoff in GSM, GSM handoff measurements, features of the GSM system, Operation of the GSM system, Security in GSM, Others Cordless Communications systems.

Universal Mobile Telecommunications System (UMTS), Comparison with GSM and others second generation systems, CDMA principle, WCDMA air interface-physical layer, Modulation techniques and spread spectrum, UMTS networks and network management. Transition from 3G to 4G networks, Features of 4G system, Data rates targets of 4G

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** Scheduled Learning in the form of lectures, tutorials, demonstrations and independent learning laboratory work.

Independent Learning will include directed reading, tutorial exercises, general reading of trade journals, academic papers and other texts.

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

**MO1** Design principles, operations, management, network hierarchies and planning of 2.5G, 3G and 4G cellular mobile communications systems

**MO2** Designing a cell in cellular system under technical constraints

**MO3** Evaluating a mobile/wireless communication system performance

**MO4** Applying the design principles for developing 2.5G, 3G and 4G mobile systems

**MO5** Appropriate system components and cell coverage areas in particular circumstances

**MO6** Research and presentation skills

**MO7** Awareness of professional literature

**MO8** Communication skills

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 126 hours

Face-to-face learning = 24 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmf9d-15-m.html) via the following link <https://uwe.rl.talis.com/modules/ufmf9d-15-m.html>

## **Part 4: Assessment**

**Assessment strategy:** The module will be assessed by two components as follows:

Component A: There will be a written examination to test understanding of underlying concepts and theory.

Component B: Will involve a mini-research-based/modelling simulation project to develop deeper understanding of the field and applications.

Formative feedback will be provided in laboratory sessions and tutorials.

**Assessment components:**

**Examination (Online) - Component A (First Sit)**

Description: Online Examination: 5 hours

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO4, MO5

**Written Assignment - Component B (First Sit)**

Description: Coursework assignment

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6, MO7, MO8

**Examination (Online) - Component A (Resit)**

Description: Online Examination: 5 hours

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

**Written Assignment - Component B (Resit)**

Description: Coursework assignment

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested:

## **Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Electronic Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19