



Module Specification

Wireless and Mobile Communications

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Part 1: Information

Module title: Wireless and Mobile Communications

Module code: UFMF9D-15-M

Level: Level 7

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

Partner institutions: None

Field: Engineering, Design and Mathematics

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: 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:

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

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 tasks:

Examination (Online) (First Sit)

Description: Online Examination: 3 hours + 2 hours for submission

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO4, MO5

Written Assignment (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) (Resit)

Description: Online Examination: 3 hours + 2 hours for submission

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Written Assignment (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 2020-21

Electronic Engineering [Sep][SW][Frenchay][5yrs] MEng 2019-20