Module Specification

Communications

Version: 2025-26, v4.0, Approved

Contents

Part 1: Information

Module title: Communications

Module code: UFMFS7-15-3

Level: Level 6

For implementation from: 2025-26

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: Mathematical Modelling for Electronics and Robotics 2024-25

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module delivers advanced material on analogue and digital communication systems building on foundations laid at level 4 and level 5 of the programme in electronic and digital systems.

The module enables analysis of existing telecommunication systems in the presence of noise. In so doing, students will learn to apply a variety of analytical methods and simulation tools to design communication systems.

Features: Not applicable

Educational aims: This module equips students with the necessary skills for them to be able to design, analyse and evaluate communications systems using suitable analytical methods.

Outline syllabus: A list of content coverage is given in the following:

Information content of signals, Transmission of information, and Hartley and Shannon's Law and its applications.

Analogue CW modulation techniques: DSB, AM, SSB, VSB, Angle Modulation, generation, demodulation and applications, Comparison including SNR performance, Super-heterodyne principle for reception.

PCM: A/D conversion, sampling (anti-aliasing filter) and encoding, quantisation noise, linear and non-linear noise, D/A conversion.

Baseband data signals: bit rate/bandwidth relationship, ISI and I diagram, error probability estimation, source, error and line coding, regeneration.

Digital CW modulation: forms, spectra and bandwidth in terms of bit rate, modems, applications.

Part 3: Teaching and learning methods

Teaching and learning methods: The delivery is intended to ensure that students have opportunity to develop practical lab-based skills alongside theoretical understanding of analogue and digital design communications systems. Relevant ethical issues will be highlighted and students will be encouraged to consider these further through directed reading.
The delivery model is a 2 hour laboratory based session where students will apply the theoretical concepts gained from the 1 hour weekly lectures.

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

MO1 Design, simulate, and analyse analogue and digital telecommunications modulation systems

MO2 Evaluate and analyse given telecommunication systems for the purposes of identifying optimal solutions for specific scenarios

MO3 Apply commonly used modulation techniques to communications engineering problems for requirements analysis

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

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/3A957121-ED20-730E-0F05-68654378CF72.html?lang=en-GB

Part 4: Assessment

Assessment strategy: The assessment of this module is as follows:

A group report where students apply numerical techniques to communications problems followed by a design exercise to simulate a communication system. This allows students to apply the knowledge they have gained throughout the module. The theoretical and practical work will help students to confidently tackle the challenges of analysis and design exercises.

Resit strategy) same as first sit

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Assessment tasks:

Report (First Sit)
Description: Group Report (20 pages)
Weighting: 100 %
Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2, MO3

Report (Resit)
Description: Group Report (20 pages)
Weighting: 100 %
Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electrical and Electronic Engineering [Frenchay] BEng (Hons) 2023-24

Electronic Engineering [Frenchay] WITHDRAWN BEng (Hons) 2023-24

Electronic and Computer Engineering [Frenchay] BEng (Hons) 2023-24

Electronic Engineering {Apprenticeship-UCW} {Top-Up} [Frenchay] BEng (Hons) 2024-25

Electronic and Computer Engineering [Frenchay] BEng (Hons) 2023-24

Electrical and Electronic Engineering [Frenchay] BEng (Hons) 2023-24

Electronic Engineering {Apprenticeship-UCW} {Top-Up} [Frenchay] BEng (Hons) 2024-25

Electronic Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2020-21

Electronic Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Electronic and Computer Engineering {Apprenticeship-GLOSCOLL} [Sep][FT][GlosColl][5yrs] BEng (Hons) 2021-22

Electronic and Computer Engineering [Sep][PT][GlosColl][5yrs] BEng (Hons) 2021-22

Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Electronic Engineering [Frenchay] BEng (Hons) 2022-23

Electronic and Computer Engineering [Frenchay] BEng (Hons) 2022-23