1. **Title of the module**

EENG6650 (EL665) Communication Systems

1. **Division or partner institution which will be responsible for management of the module**

Computing, Engineering and Mathematical Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 6

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn and Spring

1. **Prerequisite and co-requisite modules**

Pre-requisite:

EL566 Microwave and RF Circuits

EL567 Electronic Circuit Design

1. **The programmes of study to which the module contributes**

BEng Electronic and Communications Engineering

BEng Electronic and Communications Engineering with a Year in Industry

MEng in Electronic and Communications Engineering

MEng in Electronic and Communications Engineering with a Year in Industry

ECS Electronic and Computer Systems (one year top-up)

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**

1. Demonstrate an understanding of how communications principles are applied in real systems.

2. Demonstrate an ability to analyse and preform top level design regarding antennas and radio propagation, satellite, mobile and fixed communication systems.

3. Demonstrate an appreciation of the special complexities of mobile links and satellite communications.

4. Demonstrate an awareness of the available products, systems, technologies and techniques in the field of communications systems.

5. Analyse and perform high level design of communication systems

1. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**

1. Learn effectively,

2. Think critically

3. Manage their time and resources

1. **A synopsis of the curriculum**

This module presents the main principles of modern communication systems and how these are applied in real communications systems. The module provides specialist knowledge of examples of current systems, including antennas and propagation, mobile and satellite communication systems. In addition, you gain an awareness of some of the available products, systems, technologies and techniques in the field of communication systems.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Recommended Reading

* Introduction to Antenna Analysis Using EM Simulators, Kigure and Rautio, Pub: Artech House, 2011
* Satellite Communications, 4th Ed., Roddy, Pub: McGraw-Hill, 2006
* Wireless Communications and Networks, Dalal, Pub: Oxford University Press, 2015
* Wireless Communications: Principles and Practice, 2nd Ed., Rappaport, Pub: Prentice Hall – 2009

Background Reading

* Radio Communication, Green, Pub: Longman, 2000
* Satellite Communication Systems, Richharia, Pub: Macmillan, 1995
* Antennas and Propagation for Wireless Communication Systems, Saunders, Pub: Wiley, 2007
1. **Learning and teaching methods**

Total contact hours: 36

Private study hours: 114

Total study hours: 150

1. **Assessment methods**
	1. Main assessment methods
* Exam 2 hours - 60%
* 2 Assessments (5.6% each) – 11.2%
* 2 CAD Simulation workshops (14.4% each) - 28.8%

In order to obtain credit for this module on IET accredited programmes, the coursework mark and the exam mark must each be greater than or equal to 30% as well as achieving the pass mark for the module. This module will only be considered for compensation if the coursework mark and exam mark are each greater than 30%.

13.2 Reassessment methods

Like-for-like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 9.1 | 9.2 | 9.3 |  |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |
| Lectures  | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  |
| Example classes | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |  |
| Workshops | **x** | **x** |  | **x** |  | **x** | **x** | **x** |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |
| Exam | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |
| Assignments | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |
| Workshops | **x** | **x** |  | **x** |  | **x** | **x** | **x** |  |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Communication System Engineering underpins much international high data rate communications – literally across borders. The principals introduced in this module are globally applicable and are taken from internationally recognized textbooks. Meeting the learning outcomes will provide students with knowledge of internationally recognized technologies and techniques for system design and design procedures as well as practice in globally adopted engineering simulation software.

**DIVISIONAL USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

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| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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