1. **Title of the module**

EENG5700 (EL570) Communications Principles

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 5

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)**

Spring

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

None

1. **The coursesof study to which the module contributes**

BEng Computer Systems Engineering

BEng Computer Systems Engineering with a Year in Industry

BEng Electronic and Communications Engineering

BEng Electronic and Communications Engineering with a Year in Industry

MEng in Computer Systems Engineering

MEng in Computer Systems Engineering with a Year in Industry

MEng Electronic and Communications Engineering

MEng Electronic and Communications Engineering with a Year in Industry

BEng Electronic and Computer Engineering with a Foundation Year

BEng/MEng Electronic and Computer Engineering

BEng/MEng Electronic and Computer Engineering with a Year in Industry

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

1. Demonstrate ability to apply different modulation and demodulation techniques;

2. Demonstrate a critical understanding of digital transmission and the effects of channel and noise;

3. Demonstrate an understanding of information theory and error coding, and its application in modern communication systems;

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

1. demonstrate ICT skills appropriate for graduate employment,

2. show an understanding of the limits of their knowledge, and how this influences analyses and interpretations based on that knowledge.

3. use techniques to undertake critical analysis of information, and to propose solutions to problems

4. demonstrate effective time management.

1. **A synopsis of the curriculum**

This module introduces fundamental concepts of communication systems, information theory & coding, including baseband signals and noise, analogue modulation/demodulation, sampling and digitisation, digital modulation/demodulation, information theory and Shannon capacity, information measure and mutual information, source coding and channel coding/decoding. Extensive practical work is included. Examples classes also support student learning.

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

* S. Haykin, Communication Systems, Wiley, 5th Edition, 2010.
* Proakis, John G., Salehi, Masoud (2002) Communication systems engineering, Prentice Hall, New Jersey
* Ziemer, Rodger E, Tranter, William H (2014) Principles of Communications, John Wiley & Sons
* Sklar, Bernard (2013) Digital Communications: Fundamentals and Applications, Pearson Education Limited, Harlow

1. **Learning and teaching methods**

Total contact hours: 34

Private study hours: 116

Total study hours: 150

1. **Assessment methods**
   1. Main assessment methods

* 1 Assignment -10%
* 2 Laboratory Report (10% each) - 20%
* Examination 3 hours -70%

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 | 9.1 | 9.2 | 9.3 | 9.4 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures | **x** | **x** | **x** |  | **x** | **x** | **x** |
| Experimental work | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Example classes | **x** | **x** | **x** |  | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |
| Assignment | **x** | **x** | **x** |  | **x** | **x** |  |
| Lab report | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Exam | **x** | **x** | **x** |  | **x** | **x** |  |

1. **Inclusive module design**

The Division 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**

Engineering is an international discipline with techniques developed and refined by scientists across the globe. Mastery of the subject-specific learning outcomes, will equip students to apply the theories and techniques of this module in a wide range of international contexts. Communications technologies are based on internationally developed standards which are overviewed. The module team includes many members of staff with international experience of teaching and research collaboration. In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection of texts has been identified to complement the delivery of the material. The support provided to the students is also internationally attuned given our international student body.

**DIVISION USE ONLY**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 15/10/2020 | Minor | Spring 2021/22 | 5, 6, 7, 8, 9, 10, 12, 13, 14, 17 | No |
|  |  |  |  |  |

Revised FSO S 2020