1. **Title of the module**

EENG6770 (EL677) Digital Communication Systems

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

Engineering and Digital Arts

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 or Spring

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

Pre-requisite: EL570 Communication Principles

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

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

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

2. Demonstrate An understanding of communication network architectures and protocols.

3. Demonstrate An understanding of the principles of optical communication systems and their performance

1. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**
2. use ICT
3. develop core key skills, such as learning effectively, critical thinking and time management.
4. **A synopsis of the curriculum**

Information theory and Shannon capacity, information measure and mutual information, source coding and channel coding/decoding, multiuser communications.

Network architecture, topology. Access networks, voice and data. Transport networks and multiplexing. Local are networks, Ethernet, WiFi. TCP/IP networks and the Internet.

Optical communication systems. Propagation in optical fibres. Sources (LEDs, laser), modulation. Photodiodes, receivers. Optical components. System power budgets, noise and dispersion.

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

Recommended Reading

* Computer Networking and the Internet, F Halsall, Addison Wesley
* Communication Systems, Simon Haykin, 5th Edition, 2010
* Communication Systems Engineering, Proakis, Salehi, Prentice Hall
* Optical Fiber Communications: Principles and Practice, Senior et al., Pearson
* Optical Fiber Communications G.Keiser McGraw-Hill 4th Edition (2010)
1. **Learning and teaching methods**

Total contact hours: 36

Private study hours: 114

Total study hours: 150

1. **Assessment methods**
	1. Main assessment methods
* 1 Optical Communications Systems Assignment (5%)
* 1 Information Theory & Coding Assignment (5%)
* 1 Communication N/works Assignment (5%)
* Exam 3 hours (85%)

13.2 Reassessment methods

Reassessment instrument: 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 |
| **Learning/ teaching method** |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** |
| Lectures  | **x** | **x** | **x** |  |  |
| Example classes  | **x** | **x** | **x** |  | **x** |
| **Assessment method** |  |  |  |  |  |
| Information Theory and Coding examples class assignment | **x** |  |  | **x** | **x** |
| Communication Networks examples class assignment |  | **x** |  | **x** | **x** |
| Optical Communication Systems examples classes assignment |  |  | **x** | **x** | **x** |
| Exam | **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**

International standards for communications/telecommunications are covered.

**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.**

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