Liverpool John Moores University

Title:	OPTICAL COMMUNICATION SYSTEMS AND NETWORKS
Status:	Definitive
Code:	**7011ENG** (105386)
Version Start Date:	01-08-2016
Owning School/Faculty:	Electronics and Electrical Engineering
Teaching School/Faculty:	Electronics and Electrical Engineering

Team	Leader
Christopher Wood	Y

Academic Level:	FHEQ7	**Credit Value:**	20	**Total Delivered Hours:**	26
Total Learning Hours:	200	**Private Study:**	174		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	20
Practical	4

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	2
Essay	AS2	practical assignment	30	

Aims

To understand how light and matter interact.
To gain knowledge and understanding of electro-optics and optical fibre communications
To understand the factors that can effect the quality and amount of information sent down an optical fibre.

Learning Outcomes

After completing the module the student should be able to:

1	Have an advanced understanding of general optical concepts (such as diffraction) and of how light interacts with matter.
2	Have a deep understanding of the physical principles involved with the operation of electro-optic devices including photodiodes, laser diodes, fibre lasers and EFDAs.
3	Have extensive knowledge of the following: how light propagates in an optical fibre; how data is modulated onto the light source and issues that can affect the quality of the information, such as attenuation and noise.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Examination	1	2	3
Theoretical Assignment	1	2	

Outline Syllabus

Wave nature of light, photon generation, permittivity permeability and polarisation. Diffraction, refraction, scattering.
Interaction of light with matter: isotropic and anisotropic materials, optical activity, Faraday rotation, linear and non-linear electro-optic effects.
Principles of operation of photodiodes, laser diodes, fibre lasers and EFDAs.
Structure and operation of optical fibres.
Modulation techniques for optical fibres, solitons.
Degradation of signal: attenuation, absorption and dispersion.

Learning Activities

Lectures supported by handouts, practicals and numerical examples

Notes

This level 7 module aims to provide the student with an extensive knowledge of concepts in optical communication systems.