Module code	TF-4305			
Module Title	Optical Communication Systems			
Degree/Diploma	Bachelor of Engineering (Information Communication Systems)			
Type of Module	Major Option			
Modular Credits	2	**Total student workload**	4	hours/week
		Contact hours	2	hours/week
Prerequisite	None			
Anti-requisite	None			

Aims

The aim of this module is to introduce students to the main components of an optical communication system and to describe typical communication systems which employ optical techniques.

Learning Outcomes:

On successful completion of this module, a student will be expected to be able to:

Lower order :	40%	- identify the main parameters of laser diodes, optical fibre, and optical receivers that effect the performance of optical communication systems - identify different types of networking configuration that may be used in an optical networks and analyse how component selection effects network design
Middle order :	40%	- derive solutions for how dispersion affects the propagation of data signals in optical fibre, and apply these solutions to analyse the maximum data rate and transmission distance of optical transmission links - collect and analyse data
Higher order:	20%	- conduct experiments to develop and analyse an optical transmission system - present information and arguments for justification in written communications

Module Contents

- Properties of Optical Fibres: fibre types; step-index and graded-index; single-mode and multimode
- Lasers and Modulation Techniques: the laser diode; power spectrum; single-mode lasers; direct modulation; intensity modulation; frequency modulation
- Signal Degradation and Coupling Efficiency: absorption; scattering; radiative losses; core and cladding losses; material dispersion; waveguide dispersion; intermodal dispersion; nonlinear effects; mode coupling; source-to-fibre power launching
- Demodulation: photodiodes; construction; response time; direct detection
- Multiplexing: time-division multiplexing; limitations of TDM; wavelength division multiplexing; WDM using optical filters; cross-talk
- Fibre-Optic Networks: WDM networking, structure

Assessment	Formative assessment	Monthly online multiple choice and file upload questions will be used to evaluate their learning
	Summative assessment	Examination: 60%
		Coursework: 40% - 2 class tests (10% each) - 2 individual assignments (10% each)