431-630 Optical Fibre Communications Systems

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus. On campus.
Time Commitment:	Contact Hours: Thirty-six hours. Total Time Commitment: Estimated total time commitment 120 hours.
Prerequisites:	4-year Electrical Engineering degree or equivalent.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Dr Kerry James Hinton
Subject Overview:	This subject covers the basic components and technologies used in the physical layer of optical communications systems. In particular, it includes the following topics: • Time Division Multiplexing (TDM) and Wavelength Division Multiplexing (WDM). • Digital modulation of light. • Laser diode operation and modulation. • Direct and external modulation of light. • Propagation of light in optical fibres. • Non-linear effects in optical fibres • Optical amplification and noise. • Optical signal detectors. • Noise in optical communication systems. • Principles of TDM & WDM networks. • Optical link design principles.
Objectives:	On completion of this subject, the students will develop skills and knowledge required to understand the fundamentals of Optical Communications: • The principles and operation of optical communications systems. • The design of a linear optical communications link. • The principles of optical signal generation, modulation, propagation and detection. • Types of network elements in TDM and WDM networks. • Impact of optical fibre propagation and non-linearities on optical signals. • Principles of optical amplification. • The cause and impact of noise in optical communications systems. The students should be able to understand operation and performance of an optical communication system and provide a simple design of a linear optical link. Furthermore, they should be able to understand the operation of devices such as laser diodes, optical modulators, optical fibres, amplifiers and receivers.

Assessment:	• Formally supervised written examination - 3 hours 60% (end of semester). This final exam is a hurdle. A student must pass the exam to pass the subject. • Written class weekly assignments – 40%;
Prescribed Texts:	Textbook: • Course notes are available from the University Bookshop. Additional Reading: • Jeff Hecht, "Understanding Fibre Optics" Prentice Hall Inc, ISBN: 013122803X • W. Gorlaski: "Optical Networking & WDM", McGraw Hill, ISBN: 0072130784. • G. Keiser, "Optical Fibre Communications" McGraw Hill, ISBN:0072321016.
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject, the students should have developed: • problem solving and analytical skills, • critical and creative thinking, with an aptitude for continued self-directed learning; • sense of intellectual curiosity; • ability to interpret data and research results; • capacity to confront unfamiliar problems; • ability to evaluate and synthesise the research and professional literature; • ability to develop models of practical applications and evaluate their performance by rigorous analytical means;
Related Course(s):	Master of Telecommunications Engineering