ELEN90059 Lightwave Systems

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 one hour lectures per week and up to 10 workshops of 3 hour duration Total Time Commitment: 200 hours
Prerequisites:	The prerequisite for this subject is: <table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>ELEN30011 Electrical Device Modelling</td><td>Semester 2</td><td>12.50</td></tr></table> OR Admission into the 364AA Master of Telecommunications Engineering.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Anti-requisite for this subject is: **ELEN40009(431-466) RF, Microwave and Optoelectronics (../../view/2010/ELEN40009)**
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Prof Christina Lim
Contact:	Prof Christina Lim Email: **chrislim@unimelb.edu.au (mailto:chrislim@unimelb.edu.au)**
Subject Overview:	**AIMS** Lightwave systems are fundamentally changing the way we communicate through broadband communications, helping clinicians to perform a range of medical procedures and diagnosis supported by advanced biomedical instrumentation and even in the way we live in our homes through sophisticated interactive televisions and security systems. This subject will explore the physical principles and issues that arise in the design of lightwave systems often found in those key industry sectors. Students will study topics from: Transmission of light over wave guides; production of light by lasers; light modulation; conversion of light signals to electrical signals; optical multiplexing and demultiplexing; light amplification; dispersion and dispersion compensation; optical nonlinearities; modulation and advanced detection schemes. This material will be complemented by exposure to lightwave systems and measurement techniques in the laboratory **INDICATIVE CONTENT**

	This subject will explore the physical principles governing the generation, modulation, amplification, guiding, transmission, multiplexing, demultiplexing and detection of light and issues that arise in the design of lightwave systems such as transmission impairments, noise. Students learn selected examples of lightwave systems and methods for design, modelling and testing of simple lightwave systems.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO's)** On completing this subject the student should be able to: 1 Explain the operation of lightwave systems in terms of the underlying physical principles 2 Design, model and simulate simple lightwave systems 3 Quantitatively model and assess the performance of common lightwave systems 4 Conduct laboratory experiments involving lightwave devices and systems as well as design tools
Assessment:	Summative assessment in the form of a final written examination of 3 hour duration at the end of semester accounts for 70% of the overall assessment for the subject A formative assessment in the form of a short 50 minutes mid-semester test accounts for 10% Continuous assessment in the form of submitted laboratory reports from workshop activities accounts for the remaining 20% of the assessment. Workshop tasks are completed as a group activity by self-selected groups of 2-3 students. Laboratory reports should not exceed 30 pages in total over the semester (approximately 25-30 hours of work per student). Hurdle requirement: Students must pass the exam to pass the subject. Intended Learning Outcomes (ILO's) 1, 2 and 3 are assessed in the mid-semester exam and the final written exam, ILO 4 is assessed in the submitted laboratory reports.
Prescribed Texts:	TBA
Recommended Texts:	None
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, students will have developed the following skills: # Ability to apply knowledge of basic science and engineering fundamentals # In-depth technical competence in at least one engineering discipline # Ability to undertake problem identification, formulation and solution # Ability to utilise a systems approach to design and operational performance # Capacity for independent critical thought, rational inquiry and self-directed learning # Ability to communicate effectively, with the engineering team and with the community at large
Notes:	Credit may not be obtained for both ELEN40009(431-466) RF, Microwave and Optoelectronics and ELEN90059 Lightwave Systems **LEARNING AND TEACHING METHODS** The subject uses lectures and problem solving sessions in conjunction with workshops which provides students with hands-on laboratory tasks to master the advanced topics and learn to operate and use a range of lightwave, microwave and electronic test and measurement as well as software tools used in the design and testing of lightwave systems. **INDICATIVE KEY LEARNING RESOURCES** A prescribed text book and a range of recommended reading list comprised of texts available from the library. Detailed study notes and other online resources are provided to further assist students with the mastering of the subject contents. Problem sets are provided to practice problem solving and design skills with and will get recommended solutions to help with the validation of their approaches. Online quizzes on selected topics to help them receive timely feedback.

	CAREERS / INDUSTRY LINKS Students are encouraged to follow the relevant areas through relevant national (e.g. Engineers Australia, Australian Institute of Physics and Australian Optical Society) and international institutions (e.g. IEEE Photonics Society and Optical Society of America) and their resources. Subject will also incorporate guest lectures from industry to provide an industry context to the topics covered.
Related Course(s):	Master of Telecommunications Engineering
Related Majors/Minors/ Specialisations:	B-ENG Electrical Engineering stream Master of Engineering (Electrical with Business) Master of Engineering (Electrical)