

ICGEE Curriculum available for 2011/2012 Academic Year

Devices for Optical Communications

Module Title:	Optoelectronics I (Devices for Optical Communications)
Module Status:	Available, running in the academic year 2011/2012, starting Sept 2011

Generic Module Information:

Name of module owner/lecturer?	Dr. Yuliya Semenova
Delivery mode: e.g. on-site, on-line, mixed-mode. For on-site specify contact hours per week	<p>On-site mode in DIT: 1.5 hours lectures per week, 1 hour average laboratory per week</p> <p>or</p> <p>Mixed mode via remote delivery: online lectures delivered through the ICGEE VLE combined with 12-hour block on-site laboratory/tutorial activities (2 day workshop on-site in DIT)</p>
Duration of the module:	1 Semester
Assessment methods and weightings where relevant:	End of semester exam (70%) plus laboratory continuous assessment (30%)
Pass standard:	40%
Penalties for late submission of continuous assessment work:	Where work is submitted up to and including 7 days late, 5% of the total marks available is deducted from the mark achieved. Where work is submitted up to and including 14 days late, 10% of the total marks available is deducted from the mark achieved. Work submitted 15 days late or more is assigned a mark of zero.
Number of ECTs or institutional credits assigned to the module:	5 ECTs
Course Content or Syllabus (Optional):	<p>Lasers:</p> <ul style="list-style-type: none"> Review of light properties, light-matter interaction, fundamentals of lasers, resonator and beam optics. <p>Semiconductor devices:</p> <ul style="list-style-type: none"> p-n junctions, LEDs, lasers, VCSELs, semiconductor optical amplifiers, optical modulators, optical switches, optical detectors. <p>Optoelectronic devices for optical communications:</p> <ul style="list-style-type: none"> Optical transmitters and receivers, Fibre amplifiers: EDFA, PDFA & Raman, WDM and filters: dielectric, AWG and grating devices, optical switches. Research directions
Learning Outcomes	<p>On completion of this module, the learner will be able to:</p> <ul style="list-style-type: none"> Formulate the operating principles of optoelectronic devices: lasers, light emitting diodes, photo-detectors, optical fibres and waveguides, optical switches and modulators. Explain through design analysis the key factors affecting the performance of a typical optoelectronic device (e.g. semiconductor laser or detector). Demonstrate through practical work the correct use of relevant optoelectronics and fibre-optics equipment in

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	<p>obtaining results, analyzing them and relating them to a typical application.</p> <ul style="list-style-type: none"> • Write a technical report addressing the key issues of a typical applications problem and present conclusions consistent with experimental results. • Undertake a literature search in relation to a specified optoelectronics or fibre-optics application and summarize the key issues and findings and include in the report.
Recommended Text	<p>There is no single book recommended for this module. Selected portions of specialized texts are referred to in the lectures. The most relevant text is:</p> <ul style="list-style-type: none"> • John M. Senior, assisted by M. Yousif Jamro (2009) Optical Fibre Communications: Principles and Practice - Third Edition: Pearson Education Ltd, Essex, England
Supplementary Texts	<ul style="list-style-type: none"> • J. Singh (1996) Optoelectronics: An Introduction to Materials and Devices, McGraw Hill. • Frederick C. Allard (1989) Fibre Optics Handbook for Engineers and Scientists: McGraw-Hill, New York. • J. Wilson and J. F. B. Hawkes (1989) Optoelectronics, An Introduction - Second Edition: Prentice Hall, Englewood Cliffs, New Jersey 07632.