UNIVERSITÀ DI PAVIA

Anno Accademico 2017/2018

OPTICAL COMMUNICATIONS

Anno immatricolazione	2017/2018
Anno offerta	2017/2018
Normativa	DM270
SSD	ING-INF/01 (ELETTRONICA)
Dipartimento	DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE
Corso di studio	ELECTRONIC ENGINEERING
Curriculum	Photonics
Anno di corso	1°
Periodo didattico	Secondo Semestre (05/03/2018 - 15/06/2018)
Crediti	9
Ore	78 ore di attività frontale
Lingua insegnamento	English
Tipo esame	SCRITTO E ORALE CONGIUNTI
Docente	ANNOVAZZI LODI VALERIO (titolare) - 5 CFU GIULIANI GUIDO - 4 CFU
Prerequisiti	Basic knowledge of electromagnetic theory, optics and electronics from the courses of the First Level Degree in Electronics and Telecommunications; basic knowledge on lasers and photodetectors.
Obiettivi formativi	This course is a survey on optical communications, and provides information on the propagation medium (the fiber), lasers and detectors, passive components,optical amplification, and telecommunication systems.
Programma e contenuti	Optical Fiber, Emitters and Photodetectors, Passive components, Networks, Measurements Optical Fibers Single-mode and multi-mode fibers, specialty fibers. Geometrical and

	optical parameters. Modal theory of fibers. Attenuation. Dispersion. Emitters and Photodetcters Lasers and LEDs for optical communications. Laser/fiber coupling. Photodiodes for optical communications. Passive components Connectors and splices. Coupled-mode theory. Couplers; mirrors and resonators with couplers. Retarders and polarizer. Isolators and circulators. Modulators. Bragg gratings and filters. Arrayed waveguide devices. Telecommunication systems Point to point interconnections. Networks. Power budget. Electro-optic repeater. Optical amplifiers. Multi-wawelength transmission (WDM). Coherent detection. Measurements? Measurements on fibers and on devices for optical communications: power, attenuation, return loss, geometrical parameters, dispersion and frequency response. OTDR, BER tester.
Metodi didattici	The course includes frontal lessons, during which the course topics are carried out including several examples, using overhead projection of transparencies and Powepoint presentations. The course is completed by some laboratory activity, where optical devices and measurement instrumentation for optical networks are shown.
Testi di riferimento	Gerd Keiser. Optical fiber Communications. McGraw Hill. For reference only. Dispense di Comunicazioni ottiche dalle lezioni dei prof. Silvano Donati, Valerio Annovazzi Lodi, Guido Giuliani. CUSL (in Italian). Copies of transparencies (on the Kiro web site).
Modalità verifica apprendimento	A written examination, including both numerical exercises and theoretical questions, will test the candidate's knowledge on modern optical networks and their components and subsystems presented in the course, as well as its ability to perform simple numerical evaluations on optical signal transmission.
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Obiettivi Agenda 2030 per lo sviluppo sostenibile	$lbl_legenda_sviluppo_sostenibile