Course Name : Fiber Optics							
Course Code	**Course Type**	**Regular Semester**	**Lecture (hours/week)**	**Seminar (hours/week)**	**Lab. (hours/week)**	**Credits**	**ECTS**
CMP 218	B	Spring	2.00	0.00	2.00	3.00	6.00

Lecturer	Anxhela Gjecka, Msc
Assistant	
Course language	Albanian
Course level	Bachelor
Description	
Objectives	
Core Concepts	

Course Outline

Week	Topic
1	Introduction to telecommunications and fiber optics. Optical fibers - Basic concepts. Fiber classification, structure, properties. Step-index fiber.
2	Light sources and transmitters. Basic innovations. LEDs. Laser diodes. Working principle. Superluminishente diodes. Characteristics of laser diodes. DFB laser diodes.
3	Extinction; Loss from bending; Emissions; absorption; Calculations for total extinction; Extinguishing measurement. Intermodal and chromatic dispersion.
4	Optical Fiber. A deeper lookThe propagation of electromagnetic waves: Wave equations; Ways. Modal theory. Linear polarization (LP) modes. Cutoff wavelength.
5	Fibrates singlemode. Working principle. Extinctions: Losses from bends; diffusion and absorption. Chromatic dispersion
6	Conventional fibers with displaced and flattened dispersion. Dispersion of polarization modes (PMD).
7	Modal theory. Compensation for chromatic dispersion in singlemode optical fibers. Nonlinear effects on a single mode fiber. Mixing four waves (FWM). Tendencies in fiber design.
8	Intermediate exam
9	Light sources and transmitters. A deeper look. Transmitter modules. Functional block diagrams and typical circuits of an optical transmitter. Optical receivers. P-n, p-i, and avalanche photodiodes.
10	Signal-noise ratio and equivalent noise power. Sensitivity and Quantum limit. Functional block diagrams and typical circuits of an optical receiver. Design of receiving circuits.
11	Fiber optic networks: Components of fiber optic networks. Point-to-point connections. Transmitters and receivers in fiber optic networks.
12	Fiber-rich fiber amplifiers, EDFA. Other types of optical amplifiers. Passive components, switches and functional modules of fiber optic networks
13	Optical fiber optic network architecture. Networks, Protocols and Services
14	SONET / SDH Networks and WDM / DWDM Networks. Optical fiber network management and their future.
15	Repetition, presentation of course assignments

16	Final Exam

Prerequisites	The student must attend the course at a minimum rate of 75%.
Literature	• R. Miho, Komunikimet me fibraoptike, 2011, Julvin 2, ISBN 99927-0-141-2; • G. P. Agraëal, Fiber Optic Communication Systems, 1998, J. Ëiley& Sons, Neë York, ISBN 0-471-17540-4; • J. C. Palais, Fiber Optic Communications, 1998, Prentice Hall, ISBN 0-13-895442-9; • P. Tomsu Ch. Schmutzer, Next Generation Optical Netëorks, 2002, Prentice Hall, ISBN 0-13-028226-x; • J. G. Proakis, M. Salehi, Communication Systems Engineering, 2002, Prentice Hall, ISBN 0-13-061793-8
References	• Optical Fiber Communications by John Senior, 3rd Edition, Prentice Hall, 2009; • Fiber Optic Communications, by Joseph Palais, fifth edition, Prentice Hall, 2004 • Fiber optics: principles and practices, by Abdul Al-Azzaëi, CRC press,2006

Course Outcome

1	Graduates with sufficient theoretical and practical training for a successful profession and with the ability to apply basic scientific knowledge in the use of optical fibers.
2	Graduates with professional skills and training in the description, formulation, modeling and analysis of problems related to optical fibers, with consideration for appropriate analytical solutions in all necessary situations.
3	Graduates with the necessary technical, academic and practical knowledge, and confidence in the application in the design and evaluation of machinery or mechanical systems or industrial processes with consideration for productivity, feasibility and social and environmental aspects.
4	Ability to identify potential sources for information or knowledge about a given issue.
5	Graduated with the practice of selecting and using appropriate techniques and tools in optical fiber problems, and the ability to effectively use information technology.
6	Ability to design and conduct experiments, collect data, analyze and draw conclusions.

Course Evaluation

In-term Studies	Quantity	Percentage
Midterms	1	30
Quizzes	0	0
Projects	2	30
Term Projects	0	0
Laboratory	0	0
Class Participation	0	0
Total in-term evaluation percent		**60**
Final exam percent		**40**
Total		**100**

ECTS Workload (Based on Student Workload)

Activities	Quantity	Duration (hours)	Total (hours)
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	3	42
Duties	2	10	20
Midterms	1	10	10
Final Exam	1	14	14
Other	0	0	0
Total Work Load			**150**
Total Work Load / 25 (hours)			**6.00**
ECTS			**6.00**