

GAZİ UNIVERSITY GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCE								
ECTS FORM								
Course Code and Title	ILT 551 INTEGRATED OPTICS							
Credits	3							
ECTS	7.5							
Name of Lecturer And e-mail address	Yrd. Doç. Dr. Halil Berberoğlu halilb@gazi.edu.tr							
Department/Program	Advanced Technologies							
Course Type	Elective							
Course Language	Turkish							
Course Semester	Fall/Spring							
Prerequisites	Any computer programming language, preferentially Matlab.							
Course Objectives	This course is designed to describe the theoretical basis of optical waveguides particularly concentrated on the transmission theory of lightwave. Basic understanding of propagation of optical fiber communications and planar optical waveguides using Maxwell's equations will be introduced to gain advanced versatile communication systems and information processing devices. The purpose of this course is to present an intermediate treatment of integrated and fiber optics.							
Course Contents	Brief review of electromagnetics and guided waves. The planar slab waveguide. Dispersion in waveguides. Graded index waveguides. Step index circular waveguides. Optical fibers and their loss and dispersion characteristics. Coupled mode theory. Nonlinear optical effects in optical fibers (Brillouin, Raman, Self-phase modulation). Beam propagation method for analyzing optical waveguides.							
Course Learning Outcomes	Ability to use technical /modern materials to be required in her/his works, ability to present oral and written forms in her/his field, ability to work on interdisciplinary studies, ability to rapidly distinguish the true an required knowledge and ability to do analyze of results..							
References (References must be up to date)	Books	1. Pollock, C.R., Fundamentals of Optoelectronics, R.D. Irwin, Inc., 1995 2. Chin-Lin, Chen, Foundation for Guided Wave Optics, John Wiley & Sons, Inc., 2007 3. Katsunari Okamoto, Fundamentals of Optical Waveguides, Academic Press, 2005. 4. Integrated optics: theory and technology, vol. 33 / Hunsperger, 2009						
	Journals, Articles, Papers, Symposiums							
Planned learning activities and teaching methods	Theoric	Practice	Lab.	Projects	Assign.	Other	Total	ECTS
	42			76	30		188	7.5
Assessment Methods and Criteria	Quantity (mark with "X")					Percentage (%)		
Midterm Exam	X					30		
Quiz								
Assignment	X					10		
Projects	X					20		
Laboratory								
Practice								
Other								
Final Exam	X					40		
WEEKLY COURSE PLAN								
Week	Contents and topics							
1. Week	Brief review of electromagnetics and guided waves							

2. Week	Brief review of electromagnetics and guided waves
3. Week	The planar slab waveguide
4. Week	The planar slab waveguide
5. Week	Dispersion in waveguides
6. Week	Graded index waveguides
7. Week	Midterm Exam
8. Week	Step index circular waveguides
9. Week	Step index circular waveguides
10. Week	Optical fibers and their loss and dispersion characteristics
11. Week	Optical fibers and their loss and dispersion characteristics
12. Week	Coupled mode theory
13. Week	Coupled mode theory
14. Week	Nonlinear optical effects in optical fibers
15. Week	Nonlinear optical effects in optical fibers
16. Week	Beam propagation method for analyzing optical waveguides