

Course Title	Nanophotonics	Course No	To be filled by the office		
Specialization	Electronics eng...	Structure (IPC)	3	0	3
Offered for	PG/PhD	Status (Core / Elective)	Elective		
Prerequisite	Electromagnetics, fundamentals of photonics	To take effect from			
Course Objectives	This course shall introduce the basic principles, applications and latest advances in the area of Nanophotonics. Student shall have a clear view about this excited new area and ready to contribute to the advances of photonic technology for a broad area of applications, from telecommunication/data communications to solid state display, energy and sensing technologies. Students shall have an opportunity to get the latest update on this new field from the seminars offered by the experts in this area.				
Course Outcomes	At the end of the course, the students will learn about Basics of photonics, Building blocks of photonic circuits and fabrication Implementation strategies of photonic devices in communication				
Contents of the course	<ol style="list-style-type: none"> 1. Over view on (6) Maxwell's equations, Bloch's theorem, numerical Eigen solver methods, Time and frequency-domain computation, Coupled-mode theories, waveguide theory, Photonics and Optoelectronics: why nano? , Nanophotonics 2. Nano scale light confinement: (3) Micro cavity effect for photonic confinement: photonic crystals, non-periodic structures and Plasmonic structures 3. Building Blocks for Nanophotonics (10) Nano-lasers, Nano-detectors, Nano-sensors, Nano-channels. 4. Photonic circuitry (3) 5. System Integration for Nanophotonics (6) Photonic crystal nano-PIC, Silicon PIC, Other approaches 6. Applications (4) Optical communications, Biochemical sensing, Quantum cryptography. 				
Textbook	<ul style="list-style-type: none"> • Paras. N. Prasad, <i>Nanophotonics</i>. New Jersey, USA:John Wiley & Sons Inc.,2004. • Motoichi Ohtsu, Kiyoshi Kobayashi, Tadashi Kawazoe, Takashi Yatsui and Makoto Naruse, <i>Principles of Nanophotonics</i>. New York, USA: CRC Press-Taylor & Francis Group, 2008. 				
References	<ol style="list-style-type: none"> 1. S. V. Gaponenko, <i>Introduction to Nanophotonics</i>, Cambridge University Press,2010 2. Herve Rigneault, Jean-Michel Lourtioz, ClaudeDelalande and Ariel Levenson, <i>Nanophotonics</i>. London, UK: ISTE Ltd., 2006. 				