

COURSE TITLE	TE142463: Optoelectronics and Laser Technology Credits: 2 ELECTIVE COURSE
LEARNING OBJECTIVES	Students are able to understand and analyze the system of Optoelectronics and laser technology and its application.
COMPETENCY	<ul style="list-style-type: none"> • Students are able to analyze and design the use of Optoelectronics devices and laser technology in various fields of application.
SUBJECTS	<ul style="list-style-type: none"> • The nature of light: reflection, refraction, polarization, superposition, interference and diffraction, light spectrum, monochromator. • Modulation of Light: Electro-Optic Effect, Magneto-Optic Effect, Acousto-Optic Effect. • Display: Cathode Ray Tube (CRT), Light Emitting diode, LCD and Plasma. • Laser: laser basic generation solid-insulator, Semiconductor, liquid laser, gas laser and Q-switching technique. • Photodetector: thermo-electric, bolometer, Pneumatic, pyroelectric, vacuum photodiode, photomultiplier, photoconductive, photodiode, avalanche photodiode, schottky photodiode, vidicon, pumblicon, CCD, digital camera. Fiber optics: Fiber Dispersions, Multimode step-index fiber, Single-mode fiber, Graded-index fiber, Fiber losses, Optical Time-Domain Reflector (OTDR). Integrated optics: light propagation in the wave guide, fabrication of slab / strip waveguide, modulator, switch, multiplexer, splitter. Optical fiber communication systems: Free Space Communication, Optical Fiber Communication System, Power Budget, Rise Time (Bandwidth) Budget, Multichannel Communication System, Code-Division Multiplexing (CDM), Coherent Optical Communication. Optoelectronic Technology Applications: distance measurement, spectrophotometer, optical storage, Holography.
MAIN REFERENCES	<ul style="list-style-type: none"> • J Wilson and JFB Hawkes, <u>Optoelectronics: An Introduction</u>, Prentice Hall, 1998. • Ronald W. Waynant and Marwood N. Ediger, <u>Electro-Optics Handbook</u>, McGraw-Hill, 2000. • Michael Bass, <u>Handbook of Optics: Fiber Optics & Nonlinear Optics</u>, McGraw-Hill, 2001 • Chinlon Lin, <u>Optoelectronic Technology and Lightwave Communications Systems</u>, Van Nostrand Reinhold, 1989.
OPTIONAL REFERENCES	Mark Johnson, Photodetection and Measurement: Maximizing Performance in Optical Systems, McGraw-Hill, 2003
PREREQUISITE	-