



# GIET POLYTECHNIC, JAGATPUR, CUTTACK

## LESSON PLAN

DISCIPLINE: ETC	SEMESTER:- 5 <sup>TH</sup>	NAME OF THE TEACHING FACULTY:- SUBHASHREE KHATUA
SUBJECT:- OPTO-ELECTRONICS TH-4(A)	No of Days per Week Class Allotted: 03	Semester From date: 01.07.2026 To date: 05.11.2026 No of Weeks:-15
Week	Class/Day	Theory Topics
1 <sup>st</sup>	1 <sup>st</sup>	<u>Unit-I:Semiconductors</u> 1.1 Introduction to semiconductors
	2 <sup>nd</sup>	1.2 Doping
	3 <sup>rd</sup>	1.3 Alloy Semiconductors
2 <sup>nd</sup>	1 <sup>st</sup>	1.4 Electron-hole pair formation and recombination
	2 <sup>nd</sup>	1.5 Energy bands in solids
	3 <sup>rd</sup>	<u>Unit-II:Optical Processes in Semiconductors</u> 2.1 Absorption in semiconductors
3 <sup>rd</sup>	1 <sup>st</sup>	2.1.1 Indirect intrinsic transitions 2.1.2 Exciton absorption
	2 <sup>nd</sup>	2.2 Donor acceptor and impurity band absorption
	3 <sup>rd</sup>	2.3 Effect of electric field on absorption
4 <sup>th</sup>	1 <sup>st</sup>	2.4 Radiation in Semiconductors 2.4.1 Relation between absorption and emission spectra(Contd.)
	2 <sup>nd</sup>	2.4.1 Relation between absorption and emission spectra
	3 <sup>rd</sup>	2.4.2 Near band gap radioactive transitions
5 <sup>th</sup>	1 <sup>st</sup>	<u>Unit-III:Optoelectronic detectors</u> 3.1 Photoconductors
	2 <sup>nd</sup>	3.2 Junction Photodiodes
	3 <sup>rd</sup>	3.3 PIN Photodiodes
6 <sup>th</sup>	1 <sup>st</sup>	3.4 Heterojunction diodes
	2 <sup>nd</sup>	3.5 Avalanche Photodiodes
	3 <sup>rd</sup>	3.6 Phototransistors
7 <sup>th</sup>	1 <sup>st</sup>	3.7 Modulated barrier Photodiode
	2 <sup>nd</sup>	3.8 Metal- semiconductor -metal photodiode
	3 <sup>rd</sup>	<u>Unit-IV:Photovoltaic devices</u> 4.1 Solar energy spectrum
8 <sup>th</sup>	1 <sup>st</sup>	4.2 Device principles
	2 <sup>nd</sup>	4.3 I-V characteristics
	3 <sup>rd</sup>	4.4 Equivalent circuit
9 <sup>th</sup>	1 <sup>st</sup>	4.5 Materials, devices and efficiencies
	2 <sup>nd</sup>	<u>Unit-V:Light emitting diode</u>



		<u>Unit-V:Light emitting diode</u>
	2nd	5.1 Electroluminescent process
	3rd	5.2 Choice of LED materials
10th	1st	5.3 Device configuration and efficiency
	2nd	5.4 Light output from LED, LED structure
	3rd	5.5 Heterojunction LED 5.6 Surface emitting LED
11th	1st	5.7 Device performance characteristics
	2nd	5.8 Frequency response and modulation bandwidth
	3rd	<u>Unit-VI:Laser diode</u> 6.1 Junction laser operating principles
12th	1st	6.2 Threshold current 6.3 Heterojunction lasers
	2nd	6.4 Distributed feedback lasers
	3rd	6.5 Cleaved coupled cavity laser
13th	1st	6.6 Quantum well lasers
	2nd	6.7 Modulation of lasers- rate equations
	3rd	6.8 Steady state solution
14th	1st	6.9 Transient phenomena and frequency response
	2nd	<u>Unit-VII:Optical fiber</u> 7.1 Introduction to optical fiber
	3rd	7.2 Structure of optical fiber
15th	1st	7.3 Propagation of light through a numerical aperture
	2nd	7.4 Pulse broadening
	3rd	7.5 Advantages and disadvantages of fiber optics

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