

LESSON PLAN		
ACADEMIC LESSON PLAN OF WINTER-2026		
Discipline:ETC	Semester: 3rd	Name of the Teaching Faculty: Laxmi Priya Khuntia
Subject: Electronics Measurement & Instrumentation	No of Days / per week class allotted: 3	Semester from date: 1/07/2026 to 5/11/2026 No of weeks: 15
Week	Class Day	Theory Topics
1st	1st	Unit-1: Qualities of Measurement(04) 1.1 Discuss the Static Characteristics
	2nd	1.2 Accuracy, sensitivity, reproducibility and static error of instruments
	3rd	1.3 Dynamic characteristics and speed of instruments.
2nd	1st	1-4 Errors of an instrument
	2nd	Unit-2: Indicating Instruments (07) 2.1 Introduction 2.2 Types of Indicating Instruments 2.3 Basic operating principle of Indicating Instruments
	3rd	2.4 Working principle of permanent magnetic moving coil Instruments
3rd	1st	2.5 Working principle of Moving Iron Instrument
	2nd	2.6 Basic principle of operation of DC Ammeter and Multi range Ammeter 2.7 Basic principle of operation of AC Ammeter and Multi range Ammeter
	3rd	2.8 Basic principle of operation of DC Voltmeter and its applications 2.9 Basic principle of operation of AC Voltmeter and its application
4th	1st	2.10 Basic principle of Ohm Meter (Series & Shunt type)
	2nd	2.11 Basic principle of Analog Multimeter and its types & applications 2.12 Operation of Q meter and its essentials
	3rd	Unit-3: Digital Instruments(07) 3.1 Principle of operation of Ramp type Digital Voltmeter & applications
5th	1st	3.2 Operation of display of Digital Multimeter & Resolution and Sensitivity
	2nd	3.3 Basic Operating principle of Digital Multimeter, its types & applications
	3rd	3.4 Basic Operating principle of Digital Frequency Meter
6th	1st	3.5 Digital Measurement of Time 3.6 Measurement of Frequency
	2nd	3.7 Operating principle of Digital Tachometer
	3rd	3.8 LCR meter & its working principle
7th	1st	Unit-4: Oscilloscope(07) 4.1 Basic Operating principle of Oscilloscope & its Block Diagram
	2nd	4.1 Basic Operating principle of Oscilloscope & its Block Diagram
	3rd	4.2 Basic Operating principle of Dual Trace Oscilloscope & its specification
8th	1st	4.3 CRO Measurements, 4.4 Lissajous figures
	2nd	4.4 Applications of Oscilloscope in measurement of Voltage and frequency
	3rd	4.5 Basic Operating principle of Digital Storage Oscilloscope
9th	1st	4.6 Basic Operating principle of High frequency Oscilloscope
	2nd	Unit-5: Bridges (06) 5.1 Types of Bridges (DC & AC Bridges) 5.2 DC Bridges (Measurement of Resistance by Wheatstone's Bridge)
	3rd	5.3 AC bridges (Measurement of inductance by Maxwell's Bridge & Hay's Bridge)
	1st	5.3 Measurement of capacitance by Schering's Bridge & DeSauty Bridge

10th	2nd	5.5 Working principle of Q meter its circuit diagram & measurement of Low impedance
	3rd	5.6 Measurement of frequency
11th	1st	5.7 LCR Meter & its measurements.
	2nd	Unit-6: Transducers & Sensors(07) 6.1 Define Transducer and Sensor 6.2 Type of Transducer 6.3 Parameters and advantages of Transducer
	3rd	6.4 Working principle of Strain Gauges, 6.5 Define Strain Gauge (No mathematical Derivation)
12th	1st	6.6 Working principle of LVDT
	2nd	6.7 Working principle of capacitive transducers (pressure) 6.8 Working principle of Load Cell (Pressure Cell)
	3rd	6.9 Working principle of Temperature Transducer (RTD, Optical Pyrometer, Thermocouple, and Thermister)
13th	1st	6.10 Working principle of Current transducer.
	2nd	6.11 Working principle of Proximity & Light sensors.
	3rd	Unit-7: Signal Generator, Wave Analyser & DAS (07) 7.1 General aspect & classification of Signal generators
14th	1st	7.2 Working principle of AF Sine and Square wave generator
	2nd	7.2 Working principle of AF Sine and Square wave generator
	3rd	7.3 Working principle of the Function Generator
15th	1st	7.4 Function of basic Wave Analyser and Spectrum Analyser
	2nd	7.4 Function of basic Wave Analyser and Spectrum Analyser
	3rd	7.5 Basic concept of Data Acquisition System (DAS)

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Subject: Opto-Electronics	No of Days / per week class allotted: 3	Semister from date: 1/07/2026 to 5/11/2026 No of weeks: 15
Week	Class Day	Theory Topics
1st	1st	Unit-1: Semiconductors(5) 1.1 Introduction to semiconductors
	2nd	1.2 Doping
	3rd	1.3 Alloy Semiconductors
2nd	1st	1.4 Electron-hole pair formation and recombination
	2nd	1.5 Energy bands in solids
	3rd	Unit-2:Optical Processes in Semiconductors (7) 2.1 Absorption in semiconductors 2.1.1 Indirect intrinsic transitions
3rd	1st	2.1.2 Exciton absorption
	2nd	2.2 Donor acceptor and impurity band absorption
	3rd	2.3 Effect of electric field on absorption
4th	1st	2.4 Radiation in Semiconductors
	2nd	2.4.1 Relation between absorption and emission spectra
	3rd	2.4.2 Near band gap radioactive transitions
5th	1st	Unit-3-Optoelectronic detectors(8) 3.1 Photoconductors
	2nd	3.2 Junction Photodiodes
	3rd	3.3 PIN Photodiodes
6th	1st	3.4 Heterojunction diodes
	2nd	3.5 Avalanche Photodiodes
	3rd	3.6 Phototransistors
7th	1st	3.7 Modulated barrier Photodiode
	2nd	3.8 Metal- semiconductor -metal photodiode
	3rd	Unit-4:Photovoltaic devices(5) 4.1 Solar energy spectrum
8th	1st	4.2 Device principles
	2nd	4.3 I-V characteristics
	3rd	4.4 Equivalent circuit
9th	1st	4.5 Materials, devices and efficiencies
	2nd	Unit-5:Light emitting diode(7) 5.1 Electroluminescent process 5.2 Choice of LED materials
	3rd	5.3 Device configuration and efficiency
10th	1st	5.4 Light output from LED, LED structure
	2nd	5.5 Heterojunction LED
	3rd	5.6 Surface emitting LED
11th	1st	5.7 Device performance characteristics
	2nd	5.8 Frequency response and modulation bandwidth
	3rd	Unit-6:Laser diode(8) 6.1 Junction laser operating principles 6.2 Threshold current
	1st	6.3 Heterojunction lasers

12th	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	Unit-7:Optical fiber(5)
	3rd	7.1 Introduction to optical fiber
15th	1st	7.2 Structure of optical fiber
	2nd	7.3 Propagation of light through a numerical aperture
	3rd	7.4 Pulse broadening
		7.5 Advantages and disadvantages of fiber optics

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Discipline:ETC	Semester: 3rd	Name of the Teaching Faculty: Laxmi Priya Khuntia
Subject: Fiber Optic Communications	No of Days / per week class allotted: 3	Semester from date: 1/07/2026 to 5/11/2026 No of weeks: 15
Week	Class Day	Theory Topics
1st	1st	Unit-1-Introduction to Fiber Optic Communication(10) 1.1 Introduction to vector nature of light
	2nd	1.1 Introduction to vector nature of light
	3rd	1.2 Propagation of light
2nd	1st	1.2 Propagation of light
	2nd	1.3 Propagation of light in a cylindrical dielectric rod
	3rd	1.3 Propagation of light in a cylindrical dielectric rod
3rd	1st	1.4 Ray model
	2nd	1.4 Ray model
	3rd	1.5 Wave model
4th	1st	1.5 Wave model
	2nd	Unit-2-Optical Fibers(8) 2.1 Different types of optical fibers
	3rd	2.1 Different types of optical fibers
5th	1st	2.2 Modal analysis of a step index fiber
	2nd	2.2 Modal analysis of a step index fiber
	3rd	2.3 Signal degradation on optical fiber due to dispersion and attenuation
6th	1st	2.3 Signal degradation on optical fiber due to dispersion and attenuation
	2nd	2.4 Fabrication of fibers and measurement techniques like OTDR
	3rd	2.4 Fabrication of fibers and measurement techniques like OTDR
7th	1st	Unit-3-Optical sources(8) 3.1 LEDs and Lasers
	2nd	3.2 Photo-detectors
	3rd	3.3 Pin-detectors
8th	1st	3.4 Detector responsivity
	2nd	3.5 Noise
	3rd	3.5 Noise
9th	1st	3.6 Optical receivers
	2nd	3.6 Optical receivers
	3rd	Unit-4-Optical link design(6) 4.1 BER calculation
10th	1st	4.1 BER calculation
	2nd	4.2 Quantum limit
	3rd	4.2 Quantum limit
11th	1st	4.3 Power penalties
	2nd	4.3 Power penalties
	3rd	Unit-5-Optical switches(5) 5.1 Coupled mode analysis of directional couplers
12th	1st	5.1 Coupled mode analysis of directional couplers
	2nd	5.1 Coupled mode analysis of directional couplers

	3rd	5.2 Electro-optic switches
13th	1st	5.2 Electro-optic switches
	2nd	Unit-6-Nonlinear effects in fiber optic links(8) 6.1 Concept of self-phase modulation
	3rd	6.1 Concept of self-phase modulation
14th	1st	6.2 Group velocity dispersion
	2nd	6.2 Group velocity dispersion
	3rd	6.3 Optical amplifiers: EDFA , Raman amplifier
15th	1st	6.3 Optical amplifiers: EDFA , Raman amplifier
	2nd	6.4 Coherent communication and WDM systems
	3rd	6.4 Coherent communication and WDM systems

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