

**Lecture Plan**  
**Basic Electronics (IEC-101/201)**

<b>Units</b>	<b>Lecture</b>	<b>Topics Covered</b>
<b>Unit 1</b>		<b>Semiconductor Diode</b>
	Lecture 1	Introduction to Electronics. Group-IV materials, Covalent bond & electron-hole concepts
	Lecture 2	Introduction to Conductor, Semiconductor, Insulator and Conductivity & Mobility
	Lecture 3	Numerical problems on Conductivity & Mobility
	Lecture 4	Electrons and hole in semiconductors, donor and acceptor impurities
	Lecture 5	Fermi level, Hall Effect, Diffusion, Recombination
	Lecture 6	PN- junction characteristics and its equation, Depletion Layer, Zener and Avalanche Breakdown
	Lecture 7	HWR, FWR, capacitive filters, Clippers and clampers
	Lecture 8	Voltage Doubler, LED, Schottky diodes
<b>Unit 2</b>		<b>BJT characteristics and circuits</b>
	Lecture 1	Transistor operations, CE, CB, CC configuration and their characteristics
	Lecture 2	Transistor biasing -fixed bias, emitter bias, potential divider bias, comparison of biasing circuits
	Lecture 3	Analysis of CE amplifier, concept of voltage gain & current gain. Calculation of input and output resistance
	Lecture 4	Stability factor & h parameter model (low frequency) of transistor
	Lecture 5	Computation of $A_v$ , $A_i$ , $R_i$ , $R_o$ , of single transistor CE configurations
	Lecture 6	Problems based on biasing
	Lecture 7	Numerical Problems-1
	Lecture 8	Numerical Problems-2
<b>Unit 3</b>		<b>Field Effect Transistors</b>
	Lecture 1	Introduction to FET
	Lecture 2	JFET construction and its working
	Lecture 3	Drain/ Transfer Characteristics
	Lecture 4	Basic amplifier circuits and biasing of JFET
	Lecture 5	MOSFET: Introduction ,
	Lecture 6	Enhancement and Depletion type N-channel and P- Channel
	Lecture 7	Drain/ Transfer Characteristics
	Lecture 8	Numerical Problems
<b>Unit 4</b>		<b>Switching theory and Logic Gates</b>
	Lecture 1	Introduction to Number System
	Lecture 2	Types of Number System
	Lecture 3	Conversion , compliments, Addition and Subtraction
	Lecture 4	Boolean Algebra
	Lecture 5	Canonical Form and Standard Form
	Lecture 6	Logic Gates

	Lecture 7	Universal Gates
	Lecture 8	K-maps
<b>Unit 5</b>		<b>Op-Amp and Electronic Instruments</b>
	Lecture 1	Introduction to Operational Amplifier
	Lecture 2	Concept of Ideal Op-Amp(inverting and non-inverting)
	Lecture 3	Inverter, Integrator, differentiator, voltage follower
	Lecture 4	Summing and differential amplifier
	Lecture 5	Electronic Instruments: Digital Multimeter(block diagram approach)
	Lecture 6	CRO (block diagram and its working)
	Lecture 7	Measurement of voltage, phase and frequency
	Lecture 8	Numerical Problems in Engineering Services Examinations

**References:**

1. Boylestad and Nashelsky, 'Electronic Devices and circuits' PHI, 8<sup>th</sup> Edition, 2001.
2. Jacob Millman & Christos Halkias, 'INTEGRATED ELECTRONICS', Second Edition, 1984
3. M. Morris Mano, 'Digital Design', 4th Edition
4. Sedra & Simth, Microelectronics Circuits

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**Teacher:**

**Er. Piyush Charan  
Asst. Prof.  
Dept. of ECE,  
Integral University,  
Lucknow**