GRAPHIC ERA HILL UNIVERSITY, DEHRADUN

SEMESTER I and II

Name of Department: - **Electronics and Communication Engineering**

1. Subject Code: **TEC101/201** Course Title: **Basic Electronics Engineering**
2. Contact Hours: **L:** **3** **T**: **0** **P**: **0**
3. Examination Duration (Hrs): **Theory** **3** **Practical** **0**
4. Relative Weight: **CWA** **25** **PRS** **0** **MSE** **25** **ESE** **50** **PRE** **0**
5. Credits: **3**
6. Semester: **Autumn/Spring**
7. Subject Area: **Core Course**
8. Pre-requisite: **Basic Physics.**

Course Outcome:	• Identify the terminology associated with electronics and explain the basic concepts of diodes and zener diodes. • To apply the basics of diode to analyze the rectifier circuits • Understand transistor (BJT) basics and analyze biasing circuits. • Understand and design different application circuits using Operational amplifiers. • Understanding and implementation of concepts of digital electronics. Successful completion of this course will act as foundation for EDC, AIC and VLSI circuit's courses.

Details of the Course:

Sl. No.	Contents	Contact Hours
1	**SEMICONDUCTORS AND JUNCTION DIODE CHARACTERISTICS:** Classification of solids based on energy band theory, Intrinsic semiconductors, Extrinsic Semiconductors– P-type and N-type, Electrons and Holes in intrinsic and Extrinsic semiconductors, Mobility and conductivity, Mass Action Law, charge densities in semiconductors, Drift and Diffusion current, Open circuited PN Junction diode, Current components and V- I Characteristics of PN Junction Diodes.	8
2	**RECTIFYING CIRCUITS AND D.C. POWER SUPPLY:**	6

	Introduction to power supply, Rectifiers circuit: Half wave, Center tapped full wave and Bridge rectifier circuits. Rectifier performance parameter analysis, Filter circuits: L, C and Pi filters, Zener Diode: Concept of Zener and Avalanche Breakdown. Analysis and Design of Zener Regulator circuits.	
3	**TRANSISTOR BIASING AND BIAS STABILIZATION:** Construction and characteristics of bipolar junction, transistors (BJT's)- Common Base, Common Emitter, Common Collector configuration, Transistor biasing and bias stabilization: - the operating point, stability factor analysis of fixed base bias, collector to base bias, Emitter resistance bias circuit and self bias circuit.	10
4	**INTRODUCTION TO OPERATIONAL AMPLIFIERS** Introdution to Integrated Circuirts- Advantages and Limitations. Characteristics of an Ideal op-amp, Introduction of 741 IC. Inverting and Non-inverting op-amp circuits, Adder or Summing Amplifier, Difference Amplifier, Voltage follower. Op Amp As Integrator and Differentiator.	6
5	**NUMBER SYSTEMS & BOOLEAN ALGEBRA:** Number systems and their conversion, Addition & Subtraction of binary, octal and hexadecimal numbers , multiplication & division of binary numbers, fractional numbers, Boolean algebra, logic gates , De-Morgan's theorem, implementation of basic gates using universal gates, implementation of logic functions using basic gates & universal gates, SOP & POS form of logic expression, canonical form, conversion from SOP &POS form to canonical form, simplification of Boolean function: Algebraic method, Karnaugh map method(two, three &four variable K-map with don't care condition.	10
	Total	**40**

11**. Suggested Books:**

SL. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
	Text Books	
1.	Jacob Millmann & Halkias, *Integrated Electronics*, TMH, 2nd Edition	2010
2.	Mano M. Morris and Ciletti M. D., *Digital Design,* Pearson Education, 4th Edition.	2004
	Reference Books	
1.	Kalsi H. S., '*Electronics Instrumentation*', TMH	2004
2.	Boylestad and L. Robert and Nashelsky Louis, '*Electronics Devices and Circuits Theory* ', PHI/Pearson Education, 9th Edition.	2010