SEMESTER I and II

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

1.   Subject Code: | TEC101/201 | se Title: | **Basic Electronics Engineering** |

2.   Contact Hours: **L:** | 3 | | 0 | | 0 |

3.   Examination Duration (Hrs):   **Theory** | 3 | actical | 0 |

4.   Relative Weight: **CWA** | 25 | M | 0 | E | 25 | RE | 50 | | 0 |

5.   Credits: | 3 |

6.   Semester: | **Autumn/Spring** |

7.   Subject Area: | **Core Course** |

8.   Pre-requisite: **Basic Physics**

9. **Course Outcomes:**	1. Understand the concept of Number System and Boolean algebra.
	2. Understand various properties of Intrinsic and Extrinsic Semiconductors.
	3. Explain the functioning of various diode based circuits (e.g. rectifiers, voltage regulators, clippers and clampers).
	4. Analyze various configurations of BJT Amplifier circuits.
	5. Understand the basic concepts of OP-AMP and analyze various OP-AMP based circuits used for mathematical operations.

10.   **Details of the Course:**

Unit No.	Contents	Contact Hours
1	**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

2	**Basics of Semiconductor Devices and its Applications:** 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, Diode Breakdown mechanism.		8
3	**AC to DC Conversion and Voltage Regulation:** Introduction to DC 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, Zener breakdown, Zener diode as a voltage regulator, Analysis and Design of regulator circuits using Zener diode		8
4	**Transistor and its Biasing Circuits:** 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
5	**Introduction to Operational Amplifiers:** Introduction 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
		Total	**42**

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

12.	**Mode of Evaluation**	Test / Quiz / Assignment / Mid Term Exam / End Term Exam / Lab Exam