

GRAPHIC ERA HILL UNIVERSITY, DEHRADUN

SEMESTER I / II

Name of Department:- Electronics & Communication Engineering

- | | | | | | | | |
|----|---|-------------------|---------------|--------------------------------------|-----------|------------|-----------|
| 1. | Subject Code: | TEC101/201 | Course Title: | Basic Electronics Engineering | | | |
| 2. | Contact Hours: L: | 2 | | 0 | 0 | | |
| 3. | Examination Duration (Hrs) | Theory | 3 | actical | 0 | | |
| 4. | Relative Weight: | CIE | 25 | MSE | 25 | ESE | 50 |
| 5. | Credits: | 2 | | | | | |
| 6. | Semester: | I/II | | | | | |
| 7. | Category of course | DC | | | | | |
| 8. | Pre-requisite: Basic Knowledge of Physics and Mathematics | | | | | | |

9.	Course Outcomes	<p>After completion of the course the students will be able to:</p> <p>CO1: Remember operations on number systems and understand concepts of digital circuits.</p> <p>CO2: Understand the basics of semiconductor materials and devices like, PN junction diode as well as Bipolar Junction Transistor (BJT).</p> <p>CO3: Apply and Analyze the basics of PN junction diode in rectifier circuits and BJT in Amplifier.</p> <p>CO4: Design and develop various basic electronic circuits.</p>

10. Details of the Course

S.No.	Contents	Contact Hours
1.	<p>Unit 1: Number Systems & Boolean Algebra: Number systems and their conversion, Logic gates, Boolean algebra, 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).</p>	10
2.	<p>Unit 2: Basics of Semiconductor Devices: P-N junction diode and BJT Energy band theory: Classification of solids based on energy band diagram,</p>	10

	Semiconductors; Intrinsic semiconductors, Extrinsic semiconductors– P-type and N-type, Mobility and conductivity, Mass action law, Charge densities in semiconductors, P-N Junction; Formation of depletion region, V-I characteristics of P-N junction diode, and Zener diode. Construction of bipolar junction transistors (BJT), NPN and PNP type transistor, Characteristics; Common base, Common emitter, Common collector configuration.	
3.	Unit 3: AC to DC Conversion and Introduction of Operational amplifier: Introduction to DC power supply, Rectifiers circuit: Half wave, Center tapped full wave and Bridge rectifier circuits. Rectifier performance parameter analysis (with and without capacitor filter) Introduction of Operational Amplifier: Inverting and non-Inverting Op-amp, Summing amplifier, Difference amplifier.	10
	Total	30

11. Suggested Books

Sr. No.	Name of Authors/Books/Publishers	Edition	Year of Publication / Reprint
Textbooks			
1.	Jacob Millmann & Halkias, " Integrated Electronics ", TMH.	2 nd	2009
2.	M. Morris Mano, Michael D. Ciletti, " Digital Design ", Pearson Education.	5 th	2012
Reference Books			
1.	Boylestad and L. Robert and Nashelsky Louis, " Electronics Devices and Circuits Theory ", Pearson Education,	10 th	2009
2.	S. Salivahanan and S. Arivazhagan, " Digital Circuits and Design ", Oxford University Press,	5 th	2008

12.	Mode of Evaluation	<i>Test / Quiz / Assignment / Mid Term Exam / End Term Exam</i>
------------	---------------------------	---

GRAPHIC ERA HILL UNIVERSITY, DEHRADUN

SEMESTER I / II

Name of Department: Electronics & Communication Engineering

- | | | | | | | | |
|----|---|-------------------|---------------|--|------------------|------------|-----------|
| 1. | Subject Code: | PEC151/251 | Course Title: | Basic Electronics Engineering Lab | | | |
| 2. | Contact Hours: L: | 0 | | 0 | | 2 | |
| 3. | Examination Duration (Hrs) | Theory | | 0 | Practical | 3 | |
| 4. | Relative Weight: | CIE | 25 | MSE | 25 | ESE | 50 |
| 5. | Credits: | 1 | | | | | |
| 6. | Semester: | I/II | | | | | |
| 7. | Category of course | DC | | | | | |
| 8. | Pre-requisite: Basic Knowledge of Physics & Mathematics | | | | | | |

9.	Course Outcomes	<p>After completion of the course the students will be able to:</p> <p>CO1: Identify and understand active & passive components along with various measuring instruments.</p> <p>CO2: Verify truth table of logic gates.</p> <p>CO3: Analyse the characteristics of diodes and transistors.</p> <p>CO4: Implement different electronics circuits using operational amplifier and logic gates</p>
-----------	------------------------	---

10. Details of the Course

S. No.	List of problems for which student should implement and execute in the Laboratory	Contact Hours
1.	Familiarization of electronics measuring instrument and components.	2
2.	Implementation of a resistive network on breadboard and measurement of current and voltage using multimeter	2
3.	Measurement of Amplitude and Frequency of different waveforms using a CRO	2
4.	Study and verification of the truth table for different logic gates	2
5.	To design and verify the truth table of different logic gates using NAND gate.	2
6.	To design and verify the truth table of different logic gates using NOR gate	2

7	Study V-I characteristics of PN junction diode and determine the static and dynamic resistance from the characteristic curve.	2
8	Study of a Half wave rectifier circuit with and without capacitor filter.	2
9	Study of a Full wave rectifier circuit with and without capacitor filter.	2
10	Study of V - I characteristics of Zener diode and determine its voltage regulation	2
11	Study the input and output characteristics of common base (CB) transistor.	2
12	Design and implementation of inverting & non-inverting amplifier using Op-Amp.	2
	Total	24
Innovative Experiments		
13.	Study the input and output characteristics of common collector (CC) transistor.	02
14	Design and verification of Inverting and non-inverting amplifier using Op-Amp IC.	02
15.	As suggested by the concerned faculty/lab in charge.	02
	Total	06

S.No.	Name of Authors/Books/Publishers	Edition	Year of Publication / Reprint
	Textbooks		
1.	Jacob Millmann&Halkias, " Integrated Electronics ", TMH.	2 nd	2009
2.	M. Morris Mano, Michael D. Ciletti, " Digital Design ", Pearson Education.	5 th	2012
	Reference Books		
1.	Boylestad and L. Robert and Nashelsky Louis, " Electronics Devices and Circuits Theory ", Pearson Education,	10 th	2009

II.	Mode of Evaluation	<i>Test / Quiz / Assignment / Mid Term Exam / End Term Exam</i>
------------	---------------------------	---

