

Subject Code: 1ET4000107	Subject Title: Basic Electronics
Pre-Requisite	--

RATIONALE:

Electronics is an integral part of computers; hence students of computer engineering and information technology need to know the fundamental of electronics. This course has been designed to provide the needful inputs to handle simple electronic components and circuits. Students after studying this course will be able to understand the basics of analog electronics, various electronics components and develop skills to use simple electronic instruments needed for computer-based working environment

COURSE OBJECTIVE:

The course content should be taught and implemented with the aim to develop different types of skills leading to the achievement of the following competency:

- Apply the basic electronic skills as required in the field of computers and information and communication technology.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				Total (Marks)
Lecture	Tutorial	Practical	Credit	Theory		Practical		
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment	
3	-	2	4	60	40	20	30	150

DETAILS OF COURSE CONTENTS:

Unit	Topic and Sub-topics	Total Hrs.	WEIGHTAGE %
Unit - I Electronic Components and Signals	1.1 Active and passive components. 1.2 Voltage and Current Source. 1.3 Symbols of various Semiconductor components. 1.4 Definitions of: amplitude, Frequency, Phase, Wavelength 1.5 Definitions of: Signal, waveform, spectrum, Time and frequency domain representation 1.6 Test Signals: unit step, unit impulse, and unit ramp 1.7 Types of Signals: sinusoidal, triangular and saw tooth, square	10	25

Unit- II Diodes and Applications	2.1 P-N junction diode 2.2 Bridge Rectifier 2.3 'T' and ' π ' Filter circuits 2.4 Zener diode, Zener diode as voltage regulator	08	20
Unit- III Transistors	3.1 PNP and NPN transistor (working principle) 3.2 Transistor as switch 3.3 FET, working of PMOS and NMOS 3.4 Working of CMOS Logic Family	08	20
Unit- IV Oscillators	4.1 Types of feedback(Positive and Negative) 4.2 Principles of oscillation. 4.3 Oscillators: Hartley and Colpitts	08	15
Unit-V Cables, Connectors and Measuring Instruments	5.1 Analog and Digital display. 5.2 Cables: coaxial cable, twisted pair cable and fiber optic cable 5.3 Connectors: coaxial cable connectors, RJ-45, RS-232, HDMI connectors 5.4 Multimeters: Analog and digital multimeter 5.5 CRO: front panel controls and application	08	20

COURSE OUTCOME:

1. Distinguish between conductors, nonconductors and semiconductors based on energy band theory and classify different types of semiconductors.
2. Demonstrate the operating principle and output characteristics of pn junction diodes, zener diode, Varactor diode, BJT, rectifiers and different diode circuits.
3. Employ the concept of Energy Band Theory and Fermi Levels to explain the operating principle of semiconductors.

SUGGESTED LIST OF PRACTICALS:

S. No.	Practical Exercise	Approx Hours Required
1	Perform Basic operations on MultiSIM/ Electronic Workbench	04
2	Measure voltage and current of a given circuit using analog and digital multimeters.	02
3	Test performance of P-N junction diode.	02
4	Operate all controls of CRO front panel.	02
5	Measure voltage and frequency of any given signal using oscilloscope.	02
6	Test performance of bridge rectifier.	02
7	Measure parameters of various signals	02
8	Test performance of transistor as a switch	02
9	Test the performance of the T-filter	02
10	Test the performance of the π -filter	02
11	Test various cables for different applications	04
12	Identify various connectors & Draw their diagram	02

LIST OF REFERENCES:

S.No.	Title of Books	Author	Publication
1	Principle of Electronics	V.K.Mehta	S.Chand & Co., latest edition
2	Electronics Principles	Albert Paul Malvino	McGraw Hill, latest edition
3	Electronics Devices and Circuit Theory	Robert L. Boylestad	Pearson, latest edition
4	Electronic	H.S.Kalsi	McGraw Hill, latest edition
5	Cables and Connectors	John Kadick	AVO International, latest edition

E-Learning Websites:

<https://www.vlab.co.in>

<https://www.electronics-tutorials.ws>

<https://www.instructables.com/>