Kerala Technological university KTU First year B.tech Syllabus for**BE101-04 INTRODUCTION TO ELECTRONICS ENGINEERING**

Course No. : BE101-04

Course Name: INTRODUCTION TO ELECTRONICS ENGINEERING
L-T-P-Credits: 2-1-0-3

Year of Introduction: 2015

Course Objectives:

1. To get basic idea about types, specification and common values of passive components
2. To familiarize the working and characteristics of diodes, transistors and MOSFETS
3. To understand working of diodes in circuits and in rectifiers
4. To familiarize some measuring instruments

Syllabus:

Evolution and Impact of Electronics, Familiarization of Resistors, Capacitors, Inductors, Transformers and Electro mechanical components, Semiconductors, PN junction diode, Zener diode, LED, photo diode, Bipolar Junction Transistors: Structure, principle of operation, different configurations, load line and operating point, biasing and stabilization, Transistor as amplifier, switch,
Junction Field Effect Transistors: Structure, principle of operation, characteris tics MOSFET: Structure, principle of operation, characteristics, Principle of operation of Photo transistor, UJT, SCR, Diode circuits and power supplies: Series and parallel diode circuits, Half-wave & full wave rectifiers, capacitor filter, zener voltage regulator, Electronic Measurements and measuring Instruments: Performance parameters, Analog and digital multimeter, CRO, DSO, function generator, Testing of Electronic components.

Expected outcome:

Student can identify the active and passive electronic components and can design and setup simple circuits using diodes and transistors. Voltage and currents can be measured and monitored using electronic measuring instruments

Text Book:

1. Jacob Millman, Christos Halkias, Chetan D Parikhu, Integrated Electronics, Tata Mc Graw Hill
2. Robert L. Boylested, Louis Nashelsky, Electronic Devices and Circuit Theory, Pearson Education

References:

1. David A Bell, Electronic Devices and Circuits, Oxford University Press
2. A.S. Sedra, Kenneth C. Smith, Microelectronic Circuits, Oxford University Press
3. Santiram Kal, Basic Electronics: Devices, Circuits and its fundamentals, PHI Learning
4. Donald A Neaman, Electronic Circuits Analysis and Design, Mc Graw Hill

Module 1 Contents

colour coding.Inductors and Transformers: types, specifications, Principle of working.Electro mechanical components: relays and contactors.

Module 2 Contents

Diodes: Intrinsic and extrinsic semiconductors, PN junction diode, barrierpotential, V-I characteristics, Effect of temperature. Equivalent circuit of a diode. Piece wise linear model.Specification parameters of diodes and numbering.Zener diode, Varactor diodes, characteristics, working principle of LED,photo diode, solar cell.

Module 3 Contents

Bipolar Junction Transistors: Structure, typical doping, Principle of operation, concept of different configurations. Detailed study of input and output characteristics of common base and common emitter configuration, current gain, comparison of three
configurations.Concept of load line and operating point. Need for biasin g and stabilization, voltage divider biasing, Transistor as amplifier, switch, RC coupled amplifier and frequency response Specification parameters of transistors and type numbering

Module 4 Contents

Junction Field Effect Transistors: Structure, principle of operation,characte ristics, comparison with BJT.
MOSFET: Structure, principle of operation of Enhancement type MOSFET, Current voltage characteristics, Depletion-type MOSFET. Principle of operation of Photo transistor, UJT, SCR.

Module 5 Contents

Diode circuits and power supplies: Series and parallel diode circuits,Clippers, Clampers, Voltage multipliers
Half-wave and full wave (including bridge) rectifiers, Derivation of Vrms, Vdc, ripple factor, peak inverse voltage, rectification efficiency in each
case, capacitor filter, working and design of a simple zener voltage regulator.Block diagram description of a DC Power supply, Principle of SMPS

Module 6 Contents

Electronic Measurements and measuring Instruments.
Generalized performance parameters of instruments: error, accuracy, sensitivity, precision and resolution. Principle and block diagram of analog and digital multimeter, Block diagram of CRO, Measurements using CRO, Lissajous patterns, Principle and block diagram of DSO, function generator. Testing of Electronic components. Hence the B.tech Syllabus for KTU .