

Kerala Technological university KTU First year B.tech Syllabus
for **EC100 Basics Of Electronics Engineering**

Course No. : EC100

Course Name: Basics Of 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, MOSFETS and some measuring instruments.
3. To understand working of diodes in circuits and in rectifiers.

Syllabus:

Evolution and Impact of Electronics in industries and in society, Familiarization of Resistors, Capacitors, Inductors, Transformers and Electro mechanical components, PN Junction diode: Structure, Principle of operation, Photo diode, LED, Solar cell, Bipolar Junction Transistors: Structure, Principle of operation, characteristics, Rectifiers and power supplies: Half wave and full wave rectifier, capacitor filter, zener voltage regulator, Amplifiers and Oscillators: common emitter amplifier, feedback, oscillators, RC phase shift oscillator, Analogue Integrated circuits: operational amplifier, inverting and non inverting amplifier, comparator, Electronic Instrumentation: digital multimeter, digital storage oscilloscope, function generator, Radio communication: principle of AM & FM, super heterodyne receiver, Radar system: Principle, block diagram of pulsed radar, Satellite communication: geo-stationary satellite, transponder, Global Positioning System, Mobile communication: cellular communications, cells, GSM, Optical communication: system, principle of light transmission through fiber, Entertainment Electronics: Color television, cable TV, CCTV system, HDTV, LCD & LED displays.

Expected outcome:

Student can identify the active and passive electronic components. Student can setup simple circuits using diodes and transistors. Student will get fundamental idea about basic communication systems and entertainment electronics.

Text Book:

1. David A Bell, Electronic Devices And Circuits, Oxford University Press
2. Wayne Tomasy, Advanced Electronic Communication System, Phi Publishers

References:

1. Robert L. Boylested, Louis Nashelsky, Electronic Devices And Circuit Theory, Pearson Education
2. George Kennedy, Bernard Davis, Electronic Communication Systems, Mc Graw Hill
3. Louis E. Frenzel, Principles Of Electronic Communication Systems, Mc Graw Hill

Module 1 Contents

Evolution of Electronics, Impact of Electronics in industry and in society. Resistors, Capacitors: types, specifications. Standard values, marking, colour coding. Inductors and Transformers: types, specifications, Principle of working. Electro mechanical components: relays and contactors.

Module 2 Contents

PN Junction diode: Intrinsic and extrinsic semiconductors, Principle of operation, V-I characteristics, principle of working of Zener diode, Photo diode, LED and Solar cell. Bipolar Junction Transistors: PNP and NPN structures, Principle of operation, input and output characteristics of common emitter configuration, Typical specifications of low, medium and high power and frequency diodes and transistors, packaging.

Module 3 Contents

Rectifiers and power supplies: Block diagram description of a dc power supply, Half wave and full wave (including bridge) rectifier, capacitor filter, working of simple zener voltage regulator, Principle of SMPS Amplifiers and Oscillators: Circuit diagram and working of common emitter amplifier, Block diagram of Public Address system, concepts of feedback, working principles of oscillators, circuit diagram & working of RC phase shift oscillator.

Module 4 Contents

Analogue Integrated circuits: Functional block diagram of operational amplifier, ideal operational amplifier, inverting and non inverting amplifier, comparator. Digital ICs: Logic Gates. Electronic Instrumentation: Principle and block diagram of digital multimeter, principle of digital storage oscilloscope, principle and block diagram of function generator.

Module 5 Contents

Radio communication: principle of AM & FM, frequency bands used for various communication systems, block diagram of super heterodyne receiver. Radar system: Principle, block diagram of pulsed radar. Satellite communication: concept of geo-stationary satellite, satellite transponder, advantages, principle of Global Positioning System.

Module 6 Contents

Mobile communication: basic principles of cellular communications, concepts of cells, frequency reuse, principle and block diagram of GSM. Optical communication: block diagram of the optical communication system, principle of light transmission through fiber, advantages of optical communication systems. Entertainment and Security Electronics Technology: Basic principles of cable TV, CCTV, DTH system, HDTV, Plasma, LCD, LED TV.