II YEAR I SEM

15ABEE01-BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Common for ME and CSE)

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PART-A: BASIC ELECTRICAL ENGINEERING

Objectives: This course aims at providing fundamental concepts of electrical circuits, DC, AC

Machines and Electrical instruments, which help to increase knowledge and to apply principles

in their applications

UNIT I: Fundamentals of Electrical Circuits & Instruments
Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchhoff's Laws, Inductive networks, Series, Parallel circuits and Star-Delta and Delta-Star transformations.
Basic Principle of indicating instruments – permanent magnet moving coil and moving iron instruments.

UNIT II: DC Machines
Principle of operation of DC Generator – EMF equation – types - DC motor types torque equation applications – Three point starter

UNIT III: AC Machines
Principle of Operation of alternators – regulation by synchronous impedance method principle of operation of induction motor – slip – torque characteristics – applications Principle of Operation of single phase transformers –EMF equation – losses –efficiency and regulation

TEXT BOOKS
1. Network Analysis – A Sudhakar, Shyammohan S.Palli, 3 ed., 2009. TMH Publications.
2. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand &Co.

REFERENCES
1. Network analysis and Synthesis – CL Wadhwa, 3 ed., 2007, New Age International Publishers.
2. Introduction to Electrical Engineering – M.S Naidu and S.Kamakshaiah, THM Publications.
3. Basic Electrical Engineering by Kothari and Nagarath, THM Publications, 2nd Edition

COURSE OUTCOME: Students able to apply fundamental concepts, principle of electrical engineering for their applications

BOS –chairman

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PART – B: BASIC ELECTRONICS ENGINEERING

Objective:
- The objective of this Course is to provide the students with an introductory and broad treatment of the field of Electronics Engineering.

Course Outcomes:
Upon completion of the course, students will:
  a. Analyze the operating principles of major electronic devices, its characteristics and applications.
  b. Design and analyze the DC bias circuitry of BJT and FET.
  c. Design and analyze basic transistor amplifier circuits using BJT and FET.

UNIT – IV
Semiconductor Devices: The p-n Junction Diode-Forward Bias, Reverse Bias, Volt-Ampere Characteristics, Applications of Diodes, Diode as a Switch. Diode as a Rectifier-Half-wave Rectifier, Full-Wave Rectifier, Full-Wave Bridge Rectifier, Rectifiers with Filters.

UNIT – V
Transistors: Bipolar Junction Transistor (BJT) – Types of Transistors, Operation of NPN and PNP Transistors, Input-Output Characteristics of BJT in CB, CE and CC Configurations, Relation between I_C, I_B and I_E. Transistor Biasing- Fixed Bias, Voltage Divider Bias, Transistor Applications-Transistor as an Amplifier, Transistor as a Switch, Single stage CE Amplifier-Response of CE amplifier.

UNIT – VI
Oscillators and Op-Amps: Sinusoidal Oscillators, Barkhausen Criteria for Oscillator Operation, Components of an Oscillator, Classification of Oscillators, LC Tuned, RC Phase Shift Oscillator circuits.
Symbol of an Op-Amp, Characteristics of an Ideal Op-Amp, Basic Forms of Op-Amps in open and closed loop-Inverting & Non-Inverting Amplifiers, Applications of Op-Amps, summing, subtractor, Comparator.

TEXT BOOKS:
  1. Electronics Devices and Circuits, J.Millman and Christos. C. Halkias, 3rd edition, Tata McGraw Hill, 2006.
  2. Electronics Devices and Circuits Theory, David A. Bell, 5th Edition, Oxford University press., 2008.

REFERENCES:

1. Electronics Devices and Circuits Theory, R.L.Boylestad,Lousis Nashelsky and K.Lal Kishore, 12th edition, 2006, Pearson, 2006.
2. Electronic Devices and Circuits, K. Lal Kishore, 3rd Edition, BSP, 2008.
3. Electronic Devices and Circuits, N.Salivahanan, and N.Suresh Kumar, 3rd Edition, TMH, 2012
4. Microelectronic Circuits, S.Sedra and K.C.Smith, 5th Edition, Oxford University Press.