I Year-II Semester		L	T	P	C
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BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (ES1206)

Prerequisite Course: Students should have basic knowledge of electrical circuits.

Course Description and Objectives:
This course covers the topics related to analysis of various electrical circuits, operation of various electrical machines and electronic components to perform well in their respective fields.

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes.

CO	Course Outcomes	POs
1	Learn the basic principles of electrical circuital law's and analysis of networks	3
2	Understand the principle of operation and construction details of DC machines & Transformers.	2
3	Understand the principle of operation and construction details of alternator and 3-Phase induction motor	3
4	Study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs	3
5	Learn the operation of PNP and NPN transistors and various amplifiers	2

Syllabus:

Unit - I

Objective: To learn the basic principles of electrical circuital law's and analysis of networks.

Electrical Circuits Basic definitions – types of network elements – Ohm's Law – Kirchhoff's Laws – inductive networks – capacitive networks – series – parallel circuits – star-delta and delta-star transformations.- Numerical Problems.

Unit - II

Objective: To understand the principle of operation and construction details of DC machines & Transformers.

DC Machines Principle of operation of DC generator – EMF equation – types of DC machines – torque equation characteristics of DC motors – applications – three point starter – speed control methods of DC motor – Swinburne's Test-Brake test on DC shunt motor-Numerical problems.

Unit - III

Objective: To understand the principle of operation and construction details of alternator and 3-Phase induction motor

AC Machines: Transformers Principle of operation and construction of single phase transformers – EMF equation – Losses – OC & SC tests – efficiency and regulation-Numerical Problems. AC Rotating Machines Principle of operation and construction of alternators – types of alternators Regulation of alternator by synchronous impedance method – principle of operation of synchronous motor – principle of operation of 3-Phase induction motor – slip-torque characteristics – efficiency – applications Numerical Problems.

Unit IV

Objective: To study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.

Rectifiers & Linear ICs: PN junction diodes – diode applications (half wave and bridge rectifiers). Characteristics of operation amplifiers (OP-AMP) – application of OP-AMPs (inverting, non-inverting, integrator and differentiator)-Numerical Problems.

Unit V

Objective : To learn the operation of PNP and NPN transistors and various amplifiers

Transistors: PNP and NPN junction transistor, transistor as an amplifier– frequency response of CE amplifier – Basic concepts of feedback amplifier-Numerical problems.

TEXT BOOKS:

- Electrical Technology by Surinder Pal Bali, Pearson Publications.
- Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th edition, PEI/PHI 2006.

REFERENCE BOOKS:

- Electrical Circuit Theory and Technology by John Bird, Routledge Taylor &Francis Group
- Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah,TMH Publications
- Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications,2nd edition
- Basic Electrical Engineering by Nagsarkar,Sukhija, Oxford Publications,2nd edition
- Industrial Electronics by G.K. Mittal, PHI