

**NATIONAL INSTITUTE OF TECHNOLOGY
JAMSHEDPUR, JHARKHAND-831014**

Department of Electrical Engineering

SPRING SEMESTER 2020-2021

Course Handout

Date: 30-03-2021

Course Code : EE 1201 **Class: 2nd Semester, 2020 batch Production**

Course Title : **Basic Electrical & Electronics Engineering**

Instructor-in-charge : **SUSHIL KUMAR GUPTA**

Course Description

Current and Voltage Sources, Mesh Current and Node Voltage methods, Star-Delta transformation, Thevenin's theorem, Superposition theorem, Norton's theorem, Maximum power transfer theorem.

A.C. Fundamentals, Phasor representation, Electrical Circuit Elements R-L-C, their physical origin based on electromagnetic and electrostatics, R-L, R-C, R-L-C series circuits, Sinusoidal steady state: power factor, active and reactive power, parallel and series circuits, Delta and Star connections, line and phase quantities, single and three phase power measurement.

Introduction to static & rotating machines, basics of transformers and DC Machines.

Scope

- To provide a good fundamental concepts in Electrical Engineering
- To know the different techniques to solve a circuit problem
- To study A.C. quantities
- To know about the basics of Machines and Transformer

Objectives

- At the end of this course, the students will be able to understand what is Electrical Engineering?
- At the end of this course, the students will be able to apply the different techniques to solve a circuit problem.

Text books

T1. Chakrabarti Abhijit, Nath Sudip and Chanda Chandan Kumar, "Basic Electrical Engineering", TMH, 2009

Reference books

R1. Khothari D.P. and Nagrath I J, "Basic Electrical Engineering", Second Edition, TMH, 2005

R2. Nagsarkar T. K. and Sukhija M.S., "Basic Electrical Engineering", Second Edition, Oxford University Press, 2011

P.T.O.

Course Plan

Lecture No.	Learning Objectives	Topics to be Covered	Refer to Chapter, See (Book)
1-1	Kirchoff's current and voltage laws	Introduction	4 (T1)
2-4	Series-parallel resistor, Current source-voltage source, Star-delta conversion	Source Conversion	4 (T1)
5-7	Node-voltage method, Loop Current method	Mesh current and Voltage method	4 (T1)
8-10	To find response when more than one source is acting in a circuit, To find response in an element of a complex network	Thevenin and Superposition theorem	4 (T1)
11-12	RMS value, Peak value, Phase angle, leading, lagging, Phasor representation	A C fundamentals	5 (T1)
13-16	A pure resistive, pure inductive, pure capacitive circuit excited by an alternating source, Power in resistance, inductance and capacitance R-L-C circuit	Active, reactive and Apparent power in single phase circuit	5 (T1)
17-19	Line and phase quantities, single and three phase power measurement	Voltage, Current and power in three phase Circuit	6 (R1)
20-22	Construction, basic principle and emf equation of Transformer and D C machines	Basic of Transformers, D C machines	8 (R1), 10 (R1)

Evaluation Scheme

EC No.	Evaluation Component	Duration	Weightage	Date&Time	Nature of the Component
1	Mid Sem Exam	1 Hour	15%		Closed Book
2	Class Test	1 Hour	5%		Closed Book
3	Assignment		5%		Take home
4.	End Sem Exam	90 minutes	25%		Closed Book

Chamber Consultation hour: Monday, 4.00 PM to 5.00 PM, Office Chamber (G 06/03)

Notices: All notices regarding the course will be displayed only on the **notice board of Department of Electrical Engineering.**

Instructor In-charge

EE 1201