

# LESSON PLAN

**SUB: FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGG.**

**BRANCH:- MECHANICAL ENGG.**

**SEMESTER: 2<sup>ND</sup>**

**NAME OF FACULTY: ASHWINI KUMAR SAHU, TAPAN KUMAR DAS  
& UMESH KUMAR DALAI**



**GOVERNMENT POLYTECHNIC,  
BHADRAK**

**SESSION: 2024-25**

Hod. *Math & Science*

*Academic Co-ordinator*  
**Academic Co-ordinator**

*Principal*  
Govt. Polytechnic, Bhadrak  
**Principal**  
**Govt. Polytechnic**  
**Bhadrak**

<b>Discipline:</b> Mechanical Engg.	<b>Semester:</b> 2 <sup>ND</sup>	<b>Name of the Teaching Faculty :</b> ASHWINI KUMAR SAHU,TAPAN KUMAR DAS & UMESH KUMAR DALAI
<b>Subject:</b> Fundamentals of Electrical & Electronics Engg.	<b>No. of Days/per week class allotted:</b> 4	<b>Semester from date:</b> 04.02.2025 to 17.05.2025 <b>No. of Weeks:</b> 15
<b>Week</b>	<b>Class Day</b>	<b>Theory</b>
1 <sup>st</sup>	1 <sup>st</sup>	<b>UNIT I</b> Overview of Electronic Components & Signals: Passive Active Components: Resistances, Capacitors, Inductors
	2 <sup>nd</sup>	Passive Active Components: Resistances, Capacitors, Inductors
	3 <sup>rd</sup>	Diodes, Transistors, FET, MOS and CMOS and their Applications.
	4 <sup>th</sup>	Concept and simple problems of Resistance, Capacitor & Inductor
2 <sup>nd</sup>	1 <sup>st</sup>	Definition, classification and Working of diode
	2 <sup>nd</sup>	(PN junction,LED, Zener) diodes
	3 <sup>rd</sup>	transistor, FET, Concept of MOS and CMOS)
	4 <sup>th</sup>	Signals: DC/AC, voltage/current,
3 <sup>rd</sup>	1 <sup>st</sup>	periodic/non-periodic signals,
	2 <sup>nd</sup>	average, rms, peak values, different types of signal waveforms,
	3 <sup>rd</sup>	Ideal/non-ideal voltage/current sources
	4 <sup>th</sup>	independent/dependent voltage current sources
4 <sup>th</sup>	1 <sup>st</sup>	<b>UNIT II</b> Overview of Analog Circuits: Operational Amplifiers-Ideal Op-Amp
	2 <sup>nd</sup>	Practical op amp
	3 <sup>rd</sup>	Open loop and closed loop configurations
	4 <sup>th</sup>	Application of Op-Amp as amplifier
5 <sup>th</sup>	1 <sup>st</sup>	adder
	2 <sup>nd</sup>	differentiator
	3 <sup>rd</sup>	integrator
	4 <sup>th</sup>	<b>UNIT III</b> Overview of Digital Electronics: Introduction to Boolean Algebra
6 <sup>th</sup>	1 <sup>st</sup>	Introduction to Boolean Algebra
	2 <sup>nd</sup>	Electronic Implementation of Boolean Operations,
	4 <sup>th</sup>	Gates-Functional Block Approach (Simple problems of Number system)
	1 <sup>st</sup>	Gates-Functional Block Approach (Simple problems of Number system)



7 <sup>th</sup>	2 <sup>nd</sup>	Storage elements-Flip Flops ,A Functional block approach
	3 <sup>rd</sup>	counters: Ripple, Up/down and decade
	4 <sup>th</sup>	counters: Ripple, Up/down and decade
	5 <sup>th</sup>	Introduction to digital IC Gates (of TTL Type)
8 <sup>th</sup>	1 <sup>st</sup>	<b>Unit IV</b> Electric and Magnetic Circuits: EMF, Current, Potential Difference
	2 <sup>nd</sup>	Power and Energy
	3 <sup>rd</sup>	M.M.F, magnetic force, permeability
	4 <sup>th</sup>	hysteresis loop
9 <sup>th</sup>	1 <sup>st</sup>	reluctance, leakage factor and BH curve
	2 <sup>nd</sup>	Electromagnetic induction
	3 <sup>rd</sup>	Faraday's laws of electromagnetic induction, Lenz's law
	4 <sup>th</sup>	Dynamically induced emf; Statically induced emf
10 <sup>th</sup>	1 <sup>st</sup>	Equations of self and mutual inductance
	2 <sup>nd</sup>	Analogy between electric and magnetic circuits.
	3 <sup>rd</sup>	<b>Unit V</b> A.C. Circuits Cycle, Frequency, Periodic time, Amplitude, Angular velocity
	4 <sup>th</sup>	RMS value, Average value
11 <sup>th</sup>	1 <sup>st</sup>	Form Factor Peak Factor, impedance, phase angle, and power factor
	2 <sup>nd</sup>	Mathematical and phasor representation of alternating emf and current
	3 <sup>rd</sup>	Problems of RMS value, Average value, Form Factor Peak Factor, impedance, phase angle, and power factor
	4 <sup>th</sup>	Voltage and Current relationship in Star and Delta connections
12 <sup>th</sup>	1 <sup>st</sup>	Problems on Star and Delta connections
	2 <sup>nd</sup>	A.C in resistors
	3 <sup>rd</sup>	A.C in inductors
	4 <sup>th</sup>	A.C in Capacitors
13 <sup>th</sup>	1 <sup>st</sup>	A.C in R-L series
	2 <sup>nd</sup>	A.C in R-C series

	3 <sup>rd</sup>	A.C in R-L-C series and
	4 <sup>th</sup>	A.C in parallel circuits
14 <sup>th</sup>	1 <sup>st</sup>	Power in A. C. Circuits, power triangle.
	2 <sup>nd</sup>	<b>Unit VI</b> Transformer and Machines: General construction and principle of different type of transformers
	3 <sup>rd</sup>	Emf equation and transformation ratio of transformers, Auto transformers
	4 <sup>th</sup>	Construction and Working principle of DC motors
15 <sup>th</sup>	1 <sup>st</sup>	Basic equations and characteristic of motors
	2 <sup>nd</sup>	Previous year question Practice
	3 <sup>rd</sup>	Previous year question Practice
	4 <sup>th</sup>	Previous year question Practice

10/02/25  
 01-02-25  
 Signature of Faculty

1-2-25  
 S. K. S.