SYNERGY SCHOOL OF ENGINEERING, DHENKANAL
DEPARTMENT OF ELECTRICAL ENGINEERING

Dicipline: All Branches	1st Year	Name of the teaching faculty :- Mr. Amarendra Behera, Mr. Manmohan Panda	
Subject:- Fundamentals of Electrical & Electronics Engineering	No. of Days/week class Allotted :-1	No. of Weeks :-33 SESSION- 2026-2027 STARTING DATE: 17.08.2026 ENDING DATE:	
No. of week	**No. of class**	**Topic to be Taught**	**Date of Delivery**
1st	1st	**Electric & Magnetic Circuits:** Definition of EMF, Current, Potential Difference	
2nd	2nd	Ohm's law and its relation with temp., concept of source and load	
3rd	3rd	Relation of V, I &R in series and parallel circuit, voltage and current division rule	
4th	4th	Power and Energy, KCL, KVL: simple problems	
5th	5th	Basic Definition of M.M.F, magnetic force, flux, permeability, reluctance, permeance	
6th	6th	Electromagnetic induction, Faraday's laws of electromagnetic induction	
7th	7th	Lenz's law; Self and mutual inductance, leakage factor.	
8th	8th	Hysteresis loop and BH curve, Analogy between electric and magnetic circuits.	
9th	9th	AC fundamentals: Definitions of Cycle, Frequency, Periodic time, Amplitude, Angular velocity, RMS value, Average value, Form Factor Peak Factor, phase angle	
10th	10th	**A.C. Circuits:** Mathematical and phasor representation of alternating emf and current	
11th	11th	Voltage and Current relationship in Star connection (Derivation)	
12th	12th	Voltage and Current relationship in Delta connection (Derivation)	
13th	13th	Impedance, A.C in R circuit, L-circuit and C circuit with phasor	
14th	14th	Impedance, A.C in R circuit, L-circuit and C circuit with phasor	
15th	15th	Impedance, A.C in R circuit, L-circuit and C circuit with phasor	
16th	16th	Power triangle & Power factor	
17th	17th	Concept of real, reactive and apparent power with units	
18th	18th	**Transformer and DC Machines:** Fleming's rules, Construction and Working principle of DC machines	
19th	19th	Fleming's rules, Construction and Working principle of DC machines	

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20th	20th	EMF equations of DC machines and applications	
21st	21st	EMF equations of DC machines and applications	
22nd	22nd	General construction and principle of different type of transformers	
23rd	23rd	General construction and principle of different type of transformers	
24th	24th	Emf equation and transformation ratio of transformers (single phase)	
25th	25th	Emf equation and transformation ratio of transformers (single phase)	
26th	26th	**Measuring instruments, Wiring &Power billing: Measuring instruments** Introduction to measuring instruments	
27th	27th	Types of torques, concept of PMMC and MI type instruments and its uses (1- phase Ammeter, Voltmeter, wattmeter, energy meter) with connection diagram	
28th	28th	Types of torques, concept of PMMC and MI type instruments and its uses (1- phase Ammeter, Voltmeter, wattmeter, energy meter) with connection diagram	
29th	29th	Types of torques, concept of PMMC and MI type instruments and its uses (1- phase Ammeter, Voltmeter, wattmeter, energy meter) with connection diagram	
30th	30th	**Wiring &Power billing:** Types of wiring for domestic installation	
31st	31st	Calculate energy consumption in a small electric installation (domestic) with simple numerical	
32nd	32nd	Calculate energy consumption in a small electric installation (domestic) with simple numerical	
33rd	33rd	Calculate energy consumption in a small electric installation (domestic) with simple numerical	

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PREPARED BY
Mr. Amarendra Behera
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Discipline: All Branches	1ST Year	Name of the teaching faculty: - Mrs. PRAJNAPARAMITA KABI	
Subject: - Fundamental of Electrical and Electronics	No. of Days/week class Allotted: -1	No. of weeks: -31 SESSION-2026-2027 Starting date-17-08-26 Closing date-	
No. of week	**No. of class**	**Topic to be Taught**	**Date of Delivery**
1ST	1st	Passive Active Components: Resistances, Capacitors, Inductors, Diodes	
2ND	1st	Transistors and their Applications.	
3RD	1st	Concept and simple problems of Resistance, Capacitor & Inductor	
4TH	1st	Energy bands in solids, Types of materials (insulator, semiconductor, conductor) intrinsic and extrinsic semiconductors	
5TH	1st	Definition, Classification and Working of Diode (PN junction, LED, Zener)	
6TH	1st	Transistor: BJT, Definition, Types, Symbol & Terminals	
7TH	1st	Concept of FET, MOS and CMOS (Definition, Types, Symbol & Terminals)	
8TH	1st	DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values,	
9TH	1st	different types of signal waveforms Analog & Digital Signals	
10TH	1st	Definitions & Difference Ideal/non-ideal voltage/current sources,	
11TH	1st	Current sources, independent/dependent voltage current source	
12TH	1st	Diode as rectifier – half wave and full wave rectifier (center taped & bridge).	
13TH	1st	Introduction to Clippers & Clampers	
14TH	1st	Transistor (BJT only) as an amplifier	
15TH	1st	Working of RC Coupled amplifier, Oscillator	
16TH	1st	Introduction to ICs, advantages & uses	
17TH	1st	741 IC pin configuration, Operational Amplifiers	
18TH	1st	Characteristics of Ideal Op-Amp	
19TH	1st	Open loop and configurations	
20TH	1st	Closed loop configurations	
21TH	1st	Application of Op-Amp as amplifier	
22TH	1st	Op-Amp as integrator	
23TH	1st	Op-Amp as adder, differentiator	
24TH	1st	Number Systems: Binary, Octal Number system	
25TH	1st	Hexadecimal, Simple problems of Number system,	
26TH	1st	Introduction to Logic Gates (Circuit symbol & Truth table),	
27TH	1st	Universal Logic gates,	
28TH	1st	De' Morgans Law	

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29TH	1st	Implementation of Boolean expression	
30TH	1st	Implementation of Boolean expression using logic gates	
31TH	1st	Simple problem using Boolean expression	

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Prepared By

Mrs. Prajnaparamita Kabi

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