




SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Electrical Engineering

Semester/Year		I / I		Program			B.Tech					
Subject Category	B.Tech	Subject Code:	EEA101	Subject Name:	Electrical & Electronics Engineering							
Maximum Marks Allotted								Contact Hours			Total Credits	
Theory				Practical			Total Marks	L	T	P		
End Sem	Mid-Sem	Quiz	Assig	End Sem	LW	Quiz		L	T	P	Total Credits	
60	20	10	10	30	10	10	150	3	0	2	4	
Prerequisites:												
Basics of Physics and Mathematics Basics of electrical and electronic components												
Course Objective:												
<ol style="list-style-type: none"> 1. Familiarize with the basic concept of DC circuits. 2. Impart the knowledge of 1-ϕ and 3-ϕ AC circuits. 3. Impart the knowledge of Transformer and Rotating Machines 4. To explain the basic concepts of electronic devices and number systems. 												
Course Outcomes:												
CO1: Acquire knowledge and apply the concept of DC circuits in complex solving. CO2: Understand and apply the concept of AC circuits for solving the circuits. CO3: Acquire and able to evaluate the performance parameters of transformer. CO4: Understand and able to analyze the different types of DC motor and Generator. CO5: Understand and able to apply logic gates for minimization of circuits.												
UNITs	Descriptions									Hrs.	CO's	
I	DC Circuits- Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff's current and Voltage laws, source conversion, DC circuits analysis using mesh & nodal method, Theorems using DC power supply Superposition, Thevenin, star-delta transformation.									10	CO1,C O4	
II	AC Circuits- Representation of sinusoidal waveforms, peak and RMS values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series). Three-phase balanced circuits, voltage and current relations in star and delta connections.									06	CO2, CO4	
III	Transformer- Review of laws of electromagnetism, MMF, flux, and their relation, analysis of magnetic circuits. Single-phase transformer basic concepts and construction features, voltage, current and impedance transformation, equivalent circuit, losses in transformers, regulation and efficiency									09	CO2,C O3,CO 4	
IV	Rotating Electric machines- Constructional details of DC machine, working of induction machine and synchronous machine, working principle of DC machines, classification of DC machine, EMF equation, and characteristic of separately excited and self excited generators. Working principle of DC motor, Importance of back EMF, Starting of DC motor.									07	CO3,C O4	
V	Electronics- Types of Resistor, Inductor and capacitor, color coding of resistor and capacitor P-type and N-type semiconductor, semiconductor diode its operation in forward and reverse bias, V-I characteristics, half wave and full wave rectification, application. Binary Number system binary addition, subtraction, multiplication and division, subtraction operation using 1's and 2's complement forms, Octal number system, hexadecimal number system conversion of number system from one number system to another number system, Logic Gates and Universal Gates and its operations.									08	CO2, CO4	
Guest Lectures (if any)												
Total Hours											40	
Suggestive list of experiments:												
<ol style="list-style-type: none"> 1. To verify Kirchoff's voltage law and Kirchoff's current law (CO4) 2. To verify Thenvin's Theorem by experimental Kit (CO4) 3. To determine active power, reactive power, of a single phase R-L series circuit. (CO2) 												

<p>4. To determine the line current, phase current, line voltage, phase voltage, phase current and total power of a three phase balanced star connected load. (CO2)</p> <p>5. To determine the transformation ratio and perform polarity test on a single phase transformer. (CO2)</p> <p>6. To conduct open circuit test and short circuit test on single phase transformer and calculate iron losses and copper loss (CO2)</p> <p>7. To perform load test on single phase transformer and determine voltage regulation and efficiency. (CO3)</p> <p>8. To determine the armature circuit resistance of series field winding resistance, shunt field winding resistance of DC machines. (CO2)</p> <p>9. Design and verify Logic gates using diodes. (CO2, CO4)</p> <p>10. Design and verify Logic gates using transistors. (CO2, CO4)</p> <p>11. To find out resistance value using colour code.</p>				
Text Book-				
<ul style="list-style-type: none"> • Basic Electrical & Electronics Engineering by V.N. Mittle & Arvind Mittle. • A text book of electrical technology volume 2 by B L thereja and A K thereja. • Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition. 				
Reference Books-				
<ol style="list-style-type: none"> 1. Engineering Circuit Analysis by William H hayt and Kimberly 2. Electrical machinery by Dr P S Bhimbra 3. Millman, Halkias & Parikh, Integrated Electronics, Mc Graw Hill, II Edition 4. Nagrath & Kothari, Basic Electrical Engineering, III Edition TMH. 5. Hughes, Electrical and Electronic Technology, Pearson Education IX Edition 				
Modes of Evaluation and Rubric				
Theory	Attendance (5)	Midsem (10)	Performance (5)	Total (20)
	Attendance (5)	Assignmet (5)	-	Total (10)
		Quiz (10)	-	Total (10)
Practical	Attendance (5)	Lab Work (5)	Total (10)	
		Quiz (10)	Total (10)	
List/Links of e-learning resource				
<ul style="list-style-type: none"> • https://nptel.ac.in/courses/108/108/108108076/ • IISC banglore • https://nptel.ac.in/courses/108/105/108105132/ • IIT kharagpur 				
Recommendation by Board of studies on		14/6/22		
Approval by Academic council on		16/6/22		
Compiled and designed by		Dr. Monika Jain		
Subject handled by department		Electrical Engg. Dept.		

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Semester/Year		I/I		Program			B.Tech				
Subject Category		BSC		Subject Code:		EEA102		Subject Name:		Electronics Instrumentation	
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	Ass	End Sem	lab	Assg					
60	20	10	10	-	-	-	100	3	-	-	3
Prerequisites:											
Fundamental of Electrical Engineering, Laws of Electrical Engineering											
Course Objective:											
1. To understand CRO and its practical application 2. To understand the different types of AC bridges for measurement of resistance, inductance, capacitance & frequency and quality factor. 3. To understand and study transducers and multiplexing, A/D & D/A. 4. To understand digital instruments											
Course Outcomes:											
CO1: Understand and distinguish the different types of transducers. CO2: Apply the knowledge and identify different types of signal generators used in different applications. CO3: Apply the knowledge and identify different types of wave analyzer used in harmonics elimination. CO4: Demonstrate different types of digital instruments used in day to day applications. CO5: Illustrate different types and parts of CRO.											
UNITS		Descriptions							Hrs.	CO's	
I		Transducers Transducers definition and classification, Characteristic & choice of Transducers, Resistive inductive and capacitive transducers, strain gauge and gauge factor, Thermistor, Thermo couples, LVDT, Piezo-Electric transducers, Hall effect transducers, Opto-electronic transducers.							9	1,2,3,5	
II		Signal Generators Fixed & variable frequency AF oscillators, Sine wave generators, Standard signal generator, AF Sine and Square wave generator, Function generator, Square and pulse generator, Random noise generator, Sweep generator, TV Sweep generator, Marker generator, Sweep- Marker generator, Beat frequency oscillator.							9	1,2,3,4	
III		Wave analyzer Basic wave analyzer, Frequency selective wave analyzer, Heterodyne wave analyzer, Harmonic distortion, analyzer, spectrum analyzer digital Fourier analyzer.							5	1,2,3,4	
IV		Digital Instruments Advantages of Digital instruments over analog instruments, resolution and sensitivity of Digital meters. Digital Voltmeter - Ramp type, Dual slope integration type, Integrating type, Successive approximation type, Continuous balance DVM or Servo balancing potentiometer type DVM, Digital Multimeter, Digital frequency meter, Time period measurement, High frequency measurement, Electronic counter, Digital tachometer, Digital PH meter, Digital phase meter, Digital capacitance meter.							9	1,2,3,4	



