
 <p style="text-align: center;">SAMRAT ASHOK TECHNOLOGICAL INSTITUTE (Engineering College), VIDISHA M.P. (An Autonomous Institute Affiliated to RGPV Bhopal) Department of Electrical Engineering</p>												
Semester/Year		I/I		Program			B.Tech					
Subject Category	B.Tech	Subject Code:	EEA103	Subject Name:	Basic of Electrical 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		
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 able to demonstrate DC circuits. CO2: Able to demonstrate the 1-phase and 3-phase AC circuit CO3: Able to explain the construction, working, principle, test and losses of 1-phase transformer. CO4: Able to explain the construction, working and principle of rotating machine(DC). CO5: Acquire the knowledge of semiconductor devices and logic gates.												
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 2. To verify Thenvin's Theorem by experimental Kit 3. To determine active power, reactive power, of a single phase R-L series circuit. 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. 5. To determine the transformation ratio and perform polarity test on a single phase transformer. 6. To conduct open circuit test and short circuit test on single phase transformer and calculate iron losses and copper loss 												




7. To perform load test on single phase transformer and determine voltage regulation and efficiency. 8. To determine the armature circuit resistance of series field winding resistance, shunt field winding resistance of DC machines. 9. Design and verify Logic gates using diodes. 10. Design and verify Logic gates using transistors. 11. To find out resistance value using colour code.				
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. 				
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 6. Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition 				
Modes of Evaluation and Rubric				
Theory (60)	Midsem (20)	Assignment (10)	Quiz (10)	Total (100)
Practical (30)	LW (10)	Quiz (10)		Total (50)
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.	

 SAMRAT ASHOK TECHNOLOGICAL INSTITUTE (Engineering College), VIDISHA M.P. (An Autonomous Institute Affiliated to RGPV Bhopal) Department of Electrical Engineering													
Semester/Year		II / I		Program			B.Tech						
Subject Category		B.Tech		Subject Code:		EEA-104		Subject Name:		Basic Electronics			
Maximum Marks Allotted								Contact Hours			Total Credits		
Theory				Practical			Total Marks	L			T	P	Total Credits
End Sem	Mid-Sem	Quiz	Ass	End Sem	LW	quiz							
60	20	10	10	--	--	--	100	3	-	-	3		
Prerequisites:													
Semiconductor devices, Basic laws of electrical engineering and their application.													
Course Objective:													
The students will be able to,													
<ul style="list-style-type: none"> The objective of the subject is to provide students with the importance of Electronics as a subject. To provide constructional features of electronics components, their characteristics and their application in different circuit's transistor gain amplifier, special diode, diode as a rectifier diode application clipping a clamping circuit. To develop the ability to analyze electronic circuits. Students will be able to calculate the performance of the power amplifier. To introduce negative feedback/positive feedback generator of waveform of different frequency. To explain multivibrator and its application. Need of different amplifiers, calculation of common mode gain and common mode rejection ratio. 													
Course Outcomes:													
After completing the course, the students will be able to													
CO1 - Acquire knowledge and able to demonstrate construction, working principle, characteristics, different parameters related to the performance of Diode and circuits.													
CO2 - Acquire knowledge and able to demonstrate the working, characteristic and designing of Transistors.													
CO3 - Able to demonstrate the working of power amplifier, its types and features.													
CO4 - illustrate different types of oscillators, working and applications.													
CO5 - Able to apply the knowledge of different regulator and applications.													
UNITs	Descriptions							Hrs.	CO's				
I	Review of P-N junction diode, I-V characteristics of a diode; half-wave and full-wave rectifiers, Zener diodes, Varactor diode, PIN diode, LED, Photo diode, Tunnel diode, clamping and clipping circuits.							8	CO1,C O3				
II	Structure and I-V characteristics of a BJT; BJT as a switch. BJT as an amplifier: DC-AC Load line, biasing methods, current mirror; common-emitter, common-base and common collector amplifiers; Hybrid parameter transistors, Field Effect Transistor, UJT							10	CO1, CO2, CO3				
III	Power amplifiers, class A, class B, class AB efficiency and power dissipation Push Pull amplifier complimentary push pull amplifier concept of feedback amplifier, negative feedback, and its advantages, voltage series, voltage shunt, current series and current shunt feedback amplifier.							6	CO1, CO2,C O3				
IV	Barkhausen criteria of oscillator Sinusoidal oscillators circuit, L-C (Hartley-Colpitts) oscillators, RC phase shift, Wien Bridge, and Crystal oscillators. Switching characteristics of diode and transistor, transistor as switch, Multivibrators, Bistable, Monostable, Astablemultivibrators, Differential amplifier, calculation of differential, common mode gain and CMRR. Darlington pair, Boot strapping technique, 555 Timer.							7	CO1, CO2, CO3				
V	De Regulated Power Supplies : Introduction Voltage Regulator , Types of Voltage Regulators , Zener Diode Shunt Regulator , Working of Zener Diode Shunt Regulator , Optimum Value of Current Limiting, Disadvantages of Zener Diode Resistor ,Shunt Regulator , Transistor Shunt Regulator , Transistor Series Regulator.							9	CO3, CO4				
Guest Lectures (if any)													
Total Hours								40					
Suggestive list of experiments:													
NA													
Text Book-													
<ul style="list-style-type: none"> Electronic Devices and Circuits by R.S.Sheda, S.Chand. Electronic Devices and Circuits by Millman & Halkias, Mcgraw-hil Electronic Devices and Circuits theory by Robert Boysted, PHI 													



<ul style="list-style-type: none"> Electronic Devices and Circuits by J.B.Gupta, S.K.Kataria & Sons. 				
Reference Books-				
<ul style="list-style-type: none"> Achuthan MA and Bhatt KN; Fundamentals of semiconductor devices; TMH Neamen Donald; Semiconductor Physics and devices Bogart; Electronic Devices and Circuits; Universal Book Stall, New Delhi R.A. Gaikward; OP- Amp and linear Integreted circuit; PHI I.J. Nagrath; Electronics -Analog and Digital; PHI 				
Modes of Evaluation and Rubric				
Theory (60)	Midsem (20)	Assignment (10)	Quiz (10)	Total (100)
List/Links of e-learning resource				
<ul style="list-style-type: none"> NPTEL 				
Recommendation by Board of studies on		14/6/22		
Approval by Academic council on		16/6/22		
Compiled and designed by		Prof. Deepti Jain		
Subject handled by department		Electrical Engg. Dept.		

Jain *Re* *HP* *ca* *Shif* *HP* *Jain* *Shif* *Shif*

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Semester/Year		II/I		Program			B.Tech				
Subject Category		ESC		Subject Code:		EEA - 105		Subject Name:		Lab - Workshop	
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical				Total Marks	L	T	
End Sem	Mid-Sem	Quiz	Assg	End Sem	LW	Quiz					
-	-	-		30	10	10	50	-	-	2	2
Prerequisites:											
Physics, Basic symbols of R,L,C, Basic knowledge of Electronics Components.											
Course Objective:											
1. To develop specialized manpower for electrical power and energy industry. 2. To augment the student's capacity by offering projects in emerging areas of Electrical & Electronics Engineering. 3. To improve student's perspective towards environmental issues by sensitizing and building the awareness of green technologies.											
Course Outcomes:											
CO1: Acquire the knowledge and able to learn the basic of Soldering, wiring, different electrical & electronics elements, PCB forming. CO2: Acquire the knowledge of grounding, protection, fuse wire etc. CO3: Acquire the knowledge and able to demonstrate the different type of motors, their working and its application. Such as stair case wiring, a room wiring etc. useful in commercial and domestic buildings. CO4: Demonstrate different types of testing on starter and power circuits. CO5: Demonstrate different circuits related to diode, transistor, timer and their applications.											
UNITs		Descriptions						Hrs.		CO's	
I		Introduction of tools, electrical materials, symbols and abbreviations. 2 Familiarization of various types of service mains - wiring installations - accessories and household electrical appliances.						3		1,2,3	
II		Importance of Neutral and Grounding and exposure to various earthing schemes Realization of different types of wiring systems like tube light wiring, staircase wiring along with the protection elements like fuse, MCB, ELCB etc.						3		1,2,3	
III		Assembling and dissembling of D. C. Machine, single phase motor and its meggering. Assembling and dissembling of single phase transformer and its meggering Different faults in domestic appliances like automatic iron, mixture, Oven, washing machine and repairing of the same. Application of Tester and Test Lamp for fault finding in Electrical Systems 8 Introduction to DOL and STAR-DELTA starter with power circuit						3		1,2,3	
IV		Application of Tester and Test Lamp for fault finding in Electrical Systems 8 Introduction to DOL and STAR-DELTA starter with power circuit and its control circuit Calibration of Energy meter						3		1,2,3	
V		V-I characteristics of P-N junction diode and Zener diode, Light Emitting diode, gain and frequency of Colpitt oscillator, gain and frequency of Hartley oscillator, performance of IC 555 timer in Astable, Mono stable, Bistable mode, zener diode as a voltage regulator, sine wave, square wave and Triangular wave on the CRO, characteristics of Field Effect Transistor (FET).						3		1,2,3	
Guest Lectures (if any)											
Total Hours								15			
Suggestive list of experiments:											



<ul style="list-style-type: none"> • Make a circuit for one lamp controlled by one switch with PVC surface conduit system. • Make a circuit for two lamps controlled by two switches with PVC surface conduit system. • Make a circuit for one lamp controlled by one switch and provision of 2/3 pin socket. • Make a circuit for stair case wiring. • Make a circuit for godown wiring. • Make a circuit for electrical bell connection. • Make a circuit for ceiling fan with regulator • Make a circuit for series connection of lamps • Make a circuit for parallel connection of lamps • House Wiring • MCB Connection • Energy meter connection and calculation • Electricity bill calculation and analysis of bill of your on home. • Identify the sine wave, square wave and Triangular wave on the CRO & measure voltage & frequency of the wave forms.(C01) • To draw V-I characteristics of P-N junction diode and Zener diode (C02) • Design the circuit using zener diode as a voltage regulator(C04) • Evaluate performance of transistor for different transistor configuration (CO3) • To draw characteristics of field effect transistor (FET) (C02) • To draw V-I characteristics of Light Emitting diode (LED). (C02) • Determine the frequency of oscillation of wien's bridge oscillator.(C03) • Determine gain and frequency of Colpitt oscillator. (C03) • Determine gain and frequency of Hartley oscillator. (C03) • Evaluate performance of IC 555 timer in Astable, Mono stable, Bistable mode (C03) 				
Text Book-				
<ul style="list-style-type: none"> • Electrical Engineering Drawing & Design by C R Dargan. • Electronic Devices and Circuits theory by Robert Boysted, PHI • Electronic Devices and Circuits by J.B.Gupta, S.K.Kataria & Sons. 				
Reference Books-				
<ul style="list-style-type: none"> • Workshop Electrics by Alex Weiss 				
Modes of Evaluation and Rubric				
Practical (30)	LW (10)	Quiz (10)		Total (50)
List/Links of e-learning resource				
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Recommendation by Board of studies on		14/6/22		
Approval by Academic council on		16/6/22		
Compiled and designed by		Prof. Deepti Jain / Prof. Anusha Lahoti		
Subject handled by department		Electricla Engg. Deptt.		