

MYMENSINGH POLYTECHNIC INSTITUTE
TECHNOLOGY: ELECTRICAL
Name of Subject: Advance Electricity (66732)
Semester Plan

Prepared by: Fahmida Islam, Junior Instructor, Electrical

Semester:	3rd
Shift:	1st & 2nd

T	2 Nos theory class per week
P	3 Period practical class per week
C	3 Credit hour & 1 Credit 50 Mark

Week	Theory Content	Learning Materials	Practical Content
1 & 2	<p>Understand the Basic concept of electrical wiring.</p> <p>1.1 List the different types of electrical house wiring. 1.2 Describe wiring of the high-rise residential building. 1.3 Describe wiring the high rise commercial building. 1.4 Explain the indoor and outdoor wiring. 1.5 Distinguish between indoor and outdoor wiring. 1.6 Draw the wiring layout plan of a residential building. 1.7 Draw the wiring layout plan of a commercial residential building. 1.8 Describe the electrical symbols used in electrical wiring.</p>	Reference Book, Marker Pan, White Board, Multimedia Projector	<p>Show skill in connecting one lamp controlled from three different points.</p> <p>1.1 Sketch a working diagram of one lamp controlled by three SPDT and one DPDT switches. 1.2 Connect the circuit using required materials and equipment in wiring board. 1.3 Test the connection of circuit by applying proper supply. 1.4 Write a report on connecting one lamp controlled from three different points.</p>
3 & 4	<p>Understand the constructional details and working principles of different types of traditional electric lamps.</p> <p>2.1 Mention name of the different types of lamps. 2.2 Explain the working principle of tungsten filament lamp . 2.3 Describe constructional details of tungsten filament lamp. 2.4 Explain the working principle of a fluorescent lamp describing the function of the choke coil and starter. 2.5 Discuss advantages and disadvantages of fluorescent lamp. 2.6 Describe the detail circuit diagram of an electronically controlled fluorescent lamp. 2.7 Discuss the advantages of</p>		<p>Show skill in connecting one calling bell with four indicating lamps controlled from four points.</p> <p>2.1 Sketch the working wiring diagram of one calling bell with four indicating lamps controlled by four push button switch. 2.2 Connect the circuit using required materials and equipment in wiring board. 2.3 Test the connection of the circuit by applying proper supply. 2.4 Write a report connecting one calling bell with two indicating lamps controlled from two points.</p>

	electronically controlled fluorescent lamp.		
5	<p>Understand the constructional details and working principles of modern electric lamps.</p> <p>3.1 Explain the working principle of Sodium Vapour and Mercury Vapour lamps with circuit diagram.</p> <p>3.2 Explain constructional details of Sodium Vapour & Mercury Vapour lamps.</p> <p>3.3 List the uses of Sodium Vapour and Mercury Vapour lamps.</p> <p>3.4 Explain working principle of a Compact Fluorescent lamp with circuit diagram.</p> <p>3.5 Describe constructional details of a Compact Fluorescent lamp.</p> <p>3.6 Explain working principle of a Light Emitting Diode (LED) lamp and LED tube light with circuit diagram.</p> <p>3.7 Describe constructional details of LED lamp and LED tube light.</p> <p>3.8 Explain working principle of Liquid Crystal Diode (LCD) lamp with circuit diagram.</p> <p>3.9 Describe constructional details of LCD lamp.</p> <p>3.10 Explain working principle of a Cold Cathode Filament lamp (CCFL) with circuit diagram.</p> <p>3.11 Describe constructional details of a CCF lamp.</p>	<p>Show skill in connecting one lamp, one 2-pin socket and one fan in a circuit by channel wiring.</p> <p>3.1 Draw the appropriate circuit diagram showing the location of lamp, fan, switches and socket.</p> <p>3.2 Connect lamp, fan and socket as per drawing.</p> <p>3.3 Connect the circuit with the supply.</p> <p>3.4 Switch on the lamp and fan and check the power socket with the help of a test lamp.</p> <p>3.5 Write a report on connecting one lamp, one socket and one fan in a circuit.</p>	
6	<p>Understand the construction and uses of controlling and protective devices.</p> <p>4.1 Explain the meaning and uses of SPST, SPDT, DPST, DPDT, TPST, Sliding switch, MCB and MCCB.</p> <p>4.2 Describe the construction of MCB and its advantages.</p> <p>4.3 Give reasons for the uses of a Lightning Arrester</p> <p>4.4 Give reasons for the uses of a drop out fuse in distribution system.</p> <p>4.5 Describe the Internal wiring of Combined socket with switch.</p> <p>4.6 Describe the construction of Magnetic contactor.</p> <p>4.7 Explain the Forward- Reverse speed control by using magnetic contactors.</p>	<p>Show skill in connecting two fluorescent lamps in parallel in a case/shade and controlled by one switches separately.</p> <p>4.1 Draw the appropriate circuit diagram showing two fluorescent lamps in parallel and a one SPST tumbler switches.</p> <p>4.2 Wiring of the circuits according to diagram.</p> <p>4.3 Connect the circuit with the power supply.</p> <p>4.4 Switched on and observe.</p> <p>4.5 Write a report connecting two fluorescent lamps in parallel and controlled by one switch.</p>	
7	Understand the concepts of	Show skills in performing internal/	

	<p>earthing.</p> <p>5.1 Discuss the factors to be considered in performing earthing.</p> <p>5.2 Explain the working principles of pipe earthing with diagram.</p> <p>5.3 Explain the working principles of plate earthing with diagram.</p> <p>5.4 Explain the working principles of sheet earthing with diagram.</p> <p>5.5 Explain the working principles of rod earthing with diagram.</p> <p>5.6 Describe the principle and operation of earth tester.</p> <p>5.7 Describe the method of measuring the earth resistance.</p> <p>5.8 Explain the earth resistance range in different installation.</p>		<p>wiring and installing a combined socket with switch</p> <p>5.1 Draw the internal diagram showing the internal connections.</p> <p>5.2 Connect the internal points as per diagram.</p> <p>5.3 Install the combined socket.</p> <p>5.4 Test the function of the combined socket.</p> <p>5.5 Write a report on installing a combined socket with switch.</p>
8	<p>Understand the phenomenon of induced emf.</p> <p>6.1 Explain dynamically induced emf.</p> <p>6.2 Deduce the formula of dynamically induced emf.</p> <p>6.3 Explain self induced emf.</p> <p>6.4 Define Coefficient of self-induction by First, Second and Third method for self-inductance (L).</p> <p>6.5 Apply the formula obtained by First, Second and Third Method to find L of iron core.</p> <p>6.6 Explain Mutual Inductance (M).</p> <p>6.7 Define coefficient of self-induction by First, Second and Third Method for (M).</p> <p>6.8 Apply the formula obtained by First, Second and Third method to find out Mutual Inductance (M).</p> <p>6.9 Solve problems related to dynamically and statically induced emf.</p>		<p>Show skill in connecting cutout, MCB/MCCB in a circuit.</p> <p>6.1 Sketch a circuit diagram showing the location of cutout and MCB or MCCB separately with a load like heater or lamp.</p> <p>6.2 Connect the cutout/MCB/MCCB with the load as per drawing.</p> <p>6.3 Connect the circuit with the supply.</p> <p>6.4 Make necessary overloading the circuit by adding additional/excessive load or by short circuiting the load.</p> <p>6.5 Observe the operation of a MCB and MCCB or a cutout.</p> <p>6.6 Write a report on connecting cutout/MCB/MCCB in a circuit.</p>
9	Mid Term Exam		
10	<p>Understand the concept of Inductance and Co-efficient of coupling.</p> <p>7.1 Explain co-efficient of coupling.</p> <p>7.2 Deduce the expression for co-efficient of coupling.</p> <p>7.3 Solve problems on mutual inductance and co-efficient of coupling.</p> <p>7.4 Define the expression for inductance in series.</p> <p>7.5 Derive the expression for</p>		<p>Show skill in connecting one lamp, one 3-pin socket one fan in a circuit by surface conduit wiring.</p> <p>8.1 Draw the circuit diagram in a paper</p> <p>8.2 Draw the layout diagram of wiring on the booth wall.</p> <p>8.3 Cutting the wall according to diagram with identification of socket, switch board.</p> <p>8.4 Fix up the conduct pipe on the wall.</p> <p>8.5 Fastening the wall.</p> <p>8.6 Draw the proper size of cables or wires.</p>

	<p>inductance in series. 7.6 Solve problems on inductance in series.</p>	<p>8.7 Connect the switches, holders. 8.8 Check the whole installation. 8.9 Fitting the loads in proper position. 8.10 Test the wiring. 8.11 Supply and operate the load.</p>
11	<p>Understand the principle of Magnetism and Magnetization. 8.1 Explain magnetization properties of materials. 8.2 Explain cycle of magnetization. 8.3 Draw magnetization (B-H) curve. 8.4 Mention applications of B-H curve. 8.5 State and explain Steinmetz's hysteresis law. 8.6 Derive the formula for hysteresis loss on the basis of the Steinmetz's law. 8.7 Solve problems on hysteresis loss related to Steinmetz's law.</p>	<p>Show skill in installation of Plate earthing 9.1 Sketch the proper earthing diagram. 9.2 Estimate the list of materials. 9.3 List the necessary tools, equipment and materials.. 9.4 Boring the G-I Plate 9.5 Connect the earthing lead with plate</p>
12	<p>Understand the concept of hysteresis loss. and eddy current loss with their minimization 9.1 Define magnetic hysteresis. 9.2 Explain hysteresis loss. 9.3 Explain hysteresis loop. 9.4 Determine areas of hysteresis loop. 9.5 Deduce the expression for energy loss in one cycle of magnetization per cubic meter. 9.6 State the uses of hysteresis loss curves. 9.7 Define eddy current loss. 9.8 Discuss the methods for minimization of eddy current loss. 9.9 Describe the expression for eddy current loss and hysteresis loss. 9.10 Solve problems related to eddy current loss.</p>	<p>Perform skills for making a electronic calling bell 10.1 Sketch the circuit for making a calling bell. 10.2 List the necessary tools, equipment and materials. 10.3 Connect the materials as per circuit diagram. 10.4 Make and test the calling bell. 10.5 Write a complete report of making the calling bell.</p>
13	<p>Understand the concept of energy-stored in a magnetic fields. 10.1 Explain the principle of energy stored in a magnetic field. 10.2 Drive the expression for energy stored in a magnetic field. 10.3 Solve problems related to energy stored in a magnetic circuit. 10.4 Explain the lifting power of electromagnet. 10.5 Mention the application of lifting power of electromagnet.</p>	<p>Perform skills for continuity test and short circuit test of wiring and polarity test of switches in an electrical installation 11.1 Sketch the circuit for continuity test and short circuit test of wiring and polarity test of switches. 11.2 List the necessary tools, equipment and materials. 11.3 Connect the materials as per circuit diagram. 11.4 Test continuity of the wiring. 11.5 Test the short circuit of wiring. 11.5 Test the polarity of the switches.</p>

		11.6 Write a complete report for continuity test and polarity test.
14	<p>Understand the concept of various kinds of special electrical circuit.</p> <p>11.1 Describe the working principle and construction of calling bell.</p> <p>11.2 Explain the working principle and construction of Alarm circuit.</p> <p>11.3 Describe the working principle and construction of light Dimmer.</p> <p>11.4 Explain the working principle and construction of Electronic Fan regulator circuit.</p> <p>11.5 Describe the working principle and construction of Electronic Choke coil.</p>	<p>Perform skills for Insulation resistance test and earthing test of electrical installation</p> <p>12.1 Sketch the circuit for insulation resistance test and earthing test.</p> <p>12.2 List the necessary tools, equipment and materials.</p> <p>12.3 Connect the materials as per circuit diagram.</p> <p>12.4 Test the insulation resistance by using Megger of wiring</p> <p>12.5 Test the earthing by using earth tester of the wiring.</p> <p>12.6 Write a complete report for insulation resistance test and earthing test.</p>
15	<p>Understand the concept of various kinds of Testing the Electrical House Wiring.</p> <p>12.1 Mention the different types of test for newly installed electrical house wiring.</p> <p>12.2 Explain the methods of Continuity test for electrical wiring.</p> <p>12.3 Describe the method of Polarity test for switches in electrical wiring.</p> <p>12.4 Describe the methods of short circuit test for electrical wiring.</p> <p>12.5 Explain the methods of Insulation resistance test for electrical wiring.</p> <p>12.6 Explain the methods of Earth test for electrical wiring.</p>	<p>12.5 Test the earthing by using earth tester of the wiring.</p> <p>12.6 Write a complete report for insulation resistance test and earthing test.</p>
16	Review	Review