

Subject Teacher : Md. Husne Fahad
Instructor, Electrical Technology
Subject Name : Transmission and Distribution of Electrical Energy - 2
Subject Code : 66774
Technology : Electrical **Semester : 7th**
BTEB Text Book Name : (Publisher: HAQUE PUBLICATION)
Reference Book : Principles of Power Systems - V. K. Mehta

AIMS

Upon completion of these content students will be able to achieve and acquire knowledge, skill and attitude in the area of Renewable Energy with special emphasis on;

Overview of renewable energy.

Main features of renewable energy generation.

Challenges and problems associated with the use renewable energy in Bangladesh.

Availability and implementation of potential renewable energy.

SHORT DESCRIPTION

Sources of Renewable energy; Types of renewable energy; Solar energy, Wind power, Fuel cells, Biomass, Geo-thermal and alternative fuels for transportation.

Marks	Grade Point	Letter Grade	Marks	Grade Point	Letter Grade
80>	4.00	A+	55-59	2.75	B-
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

Mark Distribution (for 150 Marks)			
Theory Marks		Practical Marks	
Midterm	20	PC	25
Class test	5	PF	25
Quiz test	5	-	-
Final	120	-	-
Total	150	Total	50

Class Timing Distribution	
Particulars	Time
Greeting with students	10 Minutes
Previous Class Review	10 Minutes
Present Class Topic Discussion and Lecture Delivery	60 Minutes
Present Class Topics Review	10 Minutes

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipment's
	01	line constants of medium transmission line. Understand the effect of	1.1 Describe the effect of line constants of medium transmission line. 1.2 Express the equation for sending end voltage and current by end- condenser method, nominal T method and nominal π method for medium transmission line	To know about constants of medium transmission line.	Medium voltage line visits in the field. Projector, Internet Link: https://www.youtube.com/watch?v=TQg2Y0kp2vI
	02		1.3 Draw the phasor diagrams of end-condenser method, nominal T method and nominal π method for medium transmission line 1.4 Solve problems on end-condenser method, nominal T method and nominal π method for medium transmission line.	To know about constants of medium transmission line.	Projector, Internet Link: https://www.youtube.com/watch?v=R_ZA9KZr58
	03	Understand the effect of line	2.1 Describe the effects of line constants of long	To know about	Projector, Internet

		constants of long transmission line	transmission. 2.2Analyze long transmission line (Rigorous method of solution 2.3Solve problems related to long transmission.	constants of long transmission line.	Link: https://www.youtube.com/watch?v=b6eTfr1UjoU
	04	Understand the high voltage DC transmission	3.1Describe the high voltage DC transmission system. 3.2State the limitations of AC transmission. 3.3Discuss the economic comparison between AC and DC transmission system.	To know about the high voltage DC transmission.	high voltage line visits in the field. https://www.youtube.com/watch?v=ADipAoszSUC
	05		3.4 List the advantages of HVDC. 3.5 List the disadvantages of HVDC. 3.6 Classify HVDC links. 3.7 List the fields of application of HVDC.	To know about the high voltage DC transmission.	Projector, Internet Link: https://www.youtube.com/watch?v=KEBWauaWgg4
	06	Chapter 1 to 3	1 st Class Test	Learn about medium, long and high voltage DC transmission.	Theory base
	07	Understand the DC distribution system.	4.1Describe the classification of distribution system. 4.2 Describe DC distribution. 4.3 List different types of distributors.	To know about DC distribution system.	Projector, Internet Link: https://www.youtube.com/watch?v=qJ_2WfWk450
	08		4.4 List different types of loading. 4.5 Describe DC distributor fed at one end. 4.6 Describe DC distributor fed at both ends.	To know about DC distribution system.	Projector, Internet Link: https://www.youtube.com/watch?v=VO49hLmzlnE
	09		4.7 Describe uniformly loaded distributor. 4.8 Describe ring distributor. 4.9Solve problems on different types of distribution system.	To know about DC distribution system.	Projector, Internet Link: https://www.youtube.com/watch?v=VO49hLmzlnE

	10	Chapter 4	1 st Quiz Test	Learn about DC distribution system.	Theory and Practical base
	11	Understand the AC distribution system.	5.1 List different types of AC distribution system. 5.2 Express the equation for sending end voltage of AC distributors.	To know about AC distribution system.	Projector, Internet Link: https://www.youtube.com/watch?v=LeC_vbcSAQM
	12		5.3 Solve problems on sending end voltage of AC distributor. 5.4 Explain the methods employed for the solution of network problem of interconnected system.	To know about AC distribution system.	Projector, Internet Link: https://www.youtube.com/watch?v=LeC_vbcSAQM
	13	Understand the materials and types of underground Cables.	6.1 Define underground cable 6.2 List the advantages of underground cables. 6.3 Different types of underground cables. 6.4 List the insulating materials used in underground cables	To know about underground cables	Cables materials. https://www.youtube.com/watch?v=nBh1Hy1bt0w
	14		6.5 Describe the construction of low, high and super high voltage single phase and three phase underground cables. 6.6 Explain the insulating materials for cables. 6.7 List the properties of insulating materials for cables.	To know about underground cables	Cables materials. Projector, Internet Link: https://www.youtube.com/watch?v=u0jAVR-j60o
	15	Industrial Visit	POWER PLANT	Through the review class students will gain full understanding of power plant.	Banner
	16	Understand the materials and types of underground cables.	6.8 Describe the measurement of insulation resistance of cable. 6.9 Identify different sizes of cable. 6.10 List the properties of insulating materials for cables.	To know about underground cables.	Projector, Internet Link: https://www.youtube.com/watch?v=nBh1Hy1bt0w
	17	Understand the materials and types of underground cables.	6.11 Describe aerial cables and submarine cables. 6.10 List the causes of failure of underground cable.	To know about underground cables.	Projector, Internet Link: https://www.youtube.com/watch?v=nBh1Hy1bt0w

	18	Chapter 5 to 6	2 nd Class Test	Learn about the materials and types of underground cables.	Theory base
	19	Understand the laying and jointing of underground cable	7.1 Explain different methods of underground cable laying. 7.2 Explain the method of terminating underground cables.	Develop concept jointing of underground cable.	Projector, Internet Link: https://www.youtube.com/watch?v=Xtk7QI-JHBc
	20		7.3 Describe the heat shrink type and cold shrink type of cables jointing.	Develop concept jointing of underground cable.	Projector, Internet Link: https://www.youtube.com/watch?v=Xtk7QI-JHBc
	21	Understand the insulation resistance and dielectric stress in a single core cable and three core cable.	8.1 Describe the insulating resistance of single core cable. 8.2 Express the equation for insulation resistance of single core cable. 8.3 Solve problems on insulation resistance in single core cable.	To know about dielectric stress in a single core cable and three core cable.	Projector, Internet Link: https://www.youtube.com/watch?v=hQtETgVHkgM
	22	Chapter 7 to 8	2 nd Quiz Test	Learn about cable jointing and single core cable and three core cable.	Theory and Practical base
	23	Understand the insulation resistance and dielectric stress in a single core cable and three core cable.	8.4 Deduce the equation for dielectric stress in a single core cable. 8.5 Solve problems on dielectric stress in a single core cable.	To know about dielectric stress in a single core cable and three core cable.	Projector, Internet Link: https://www.youtube.com/watch?v=hQtETgVHkgM
	24		8.6 Describe the insulation resistance of a three-core cable. 8.7 Express the equation for insulation resistance of three core cable.	To know about dielectric stress in a single core cable and three core cable.	Projector, Internet Link: https://www.youtube.com/watch?v=hQtETgVHkgM
	25		8.8 Solve problems on insulation resistance of three core cable. 8.9 Express the equation for dielectric stress in a three-core cable.	To know about dielectric stress in a single core cable and three core cable.	Projector, Internet Link: https://www.youtube.com/watch?v=hQtETgVHkgM

	26	Understand the concept of capacitance in underground cable.	9.1 Describe the capacitance of single core cable. 9.2 Express the equation for capacitance of single core cable. 9.3 Solve problems on capacitance of single core cables.	To know about concept of capacitance in underground cable.	Projector, Internet Link: https://www.youtube.com/watch?v=5HSoYk5mUNE
	27		9.4 Describe the capacitance of a three-core underground cable. 9.5 Express the equation for the capacitance of three core cable.	To know about concept of capacitance in underground cable.	Projector, Internet Link: https://www.youtube.com/watch?v=5HSoYk5mUNE
	28		9.5 Solve problems on capacitance of three core cable. 8.6 Solve problems on dielectric stress in a three-core cable.	To know about concept of capacitance in underground cable.	Projector, Internet Link: https://www.youtube.com/watch?v=5HSoYk5mUNE
	29	Chapter 8 to 9	3 rd Class Test	Learn about concept of capacitance in underground cable.	Theory base
	30	All Review Class	Chapter: 1-9 (Regarding students' problem)		
Midterm Examination					
	31	Understand the concept of capacitance in underground cable.	9.7 Describe the grading of cables. 9.8 Deduce the equation of grading of cables. 9.9 Solve problems on grading of cables of a single core cable.	To know about concept of capacitance in underground cable.	Projector, Internet Link: https://www.youtube.com/watch?v=5HSoYk5mUNE
	32	Understand the cable faults and their localization.	10.1 List different types of cable faults. 10.2 Explain the causes of cable faults. 10.3 Describe different methods of locating cable faults	To know about the cable faults and their localization.	Projector, Internet Link: https://www.youtube.com/watch?v=OtMC5YVoKpU
	33		10.4 Express the equation for locating the faults by Clavier test. 10.5 Express the equation for locating faults by Murray Loop test and Varley Loop test. 10.6 Solve problems on locating faults of cable.	Learn about the cable Faults.	Projector, Internet Link: https://www.youtube.com/watch?v=OtMC5YVoKpU
	34	Chapter 9 to 10	3 rd Quiz Test	Learn about the cable faults and their localization.	Theory and Practical base

	35	Understand the operation of distribution line.	11.1 Sketch the circuit diagram of the distribution system. 11.2 Explain the operation of panel board of transmission system.	To know about the operation of distribution line.	Projector, Internet Link: https://www.youtube.com/watch?v=fQNQKkvGQL0
	36		11.3 Describe load dispatch Centre (LDC). 11.4 Explain the operation of a distribution system.	To know about the operation of distribution line.	Projector, Internet Link: https://www.youtube.com/watch?v=fQNQKkvGQL0
	37	Understand the features of maintenance work of distribution line.	12.1 Identify the damage and faults in the distribution line during routine (weekly/monthly) inspection or at the time of emergency. 12.2 Describe the procedure of repairing the damage and faults in the line.	To know about features of maintenance work of distribution line.	Projector, Internet Link: https://www.youtube.com/watch?v=TQg2Y0kp2vI
	38		12.3 Find the causes for damage and faults occurred. 12.4 Prepare the list of tools and materials for the repair work.	To know about features of maintenance work of distribution line.	Projector, Internet Link: https://www.youtube.com/watch?v=2IT6-ItjDbE
	39	Chapter 11 to 12	4 th Class Test	Learn about features of maintenance work of distribution line.	Theory base
	40	Understand the methods of measuring insulation resistance of the system when power is on.	13.1 Describe in brief the method of measuring the insulation resistance of the system when the power is ON. 13.2 Express the deduction of the equation for measuring the insulation resistance of the system when the power is ON. 13.3 Solve problems on measuring insulation resistance when power is ON. 13.4 Discuss the safety procedures for measuring insulation resistance of the line when power is ON.	Learn about of measuring insulation resistance of the system when power is on.	insulation resistance Projector, Internet Link: https://www.youtube.com/watch?v=4rJLUhROKMY
	41	Understand the grid system.	14.1 Describe grid system. 14.2 Explain in brief the necessity of grid system. 14.3 List different types of grid system. 14.4 Identify the advantages of grid system. 14.5 Outline the grid system of Bangladesh. 14.6 Outline the grid system of some advance countries.	To know about the grid system	Grid system visits in the field.

	42	Chapter 13 to 14	4 th Quiz Test	Learn about the grid system and measuring insulation resistance of the system when power is on.	Theory and Practical base
	43		Review Class & Extra Class		Theory base
	44		Review Class & Extra Class		Theory base
Final Examination					