Daffodil Polytechnic Institute, Institute Code: 50238

Lesson Plan – Academic session: August 2025 to January 2026

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

Subject Teacher : Rubel Hossen
Instructor, Electrical Technology
Subject Name : TRANSMISSION AND DISTRIBUTION OF ELECTRICAL POWER – I
Subject Code : 26762
Technology : Electrical
Semester : 6th

Mark Distribution (for 150 Marks)			
Theory Marks		**Practical Marks**	
Midterm	30	PC	25
Class test	20	PF	25
Quiz test	10	-	-
Final	90	-	-
Total	**150**	**Total**	**50**

Class Timing Distribution	
Particulars	Time
Greeting with students	05 Minutes
Previous Class Review	05 Minutes
Present Class Topic Discussion and Lecture Delivery	30 Minutes
Present Class Topics Review	05 Minutes

BTEB Text Book Name : (Publisher: HAQUE PUBLICATION)
Reference Book : Principles of Energy System - V K Mehta.
Transmission & Distribution of Electrical Power - H. Cotton.

AIMS

Diploma in Engineering Level students are required to acquire knowledge and skills on the area of the transmission and distribution of electrical power with special emphasis on the basic concept of transmission and distribution system. transmission and distribution of electrical power is a subject where a student will deal with aspects of transmission and distribution system, grid system, overhead lines and its supports, conductors, insulators, cables, sag and its effects, string efficiency, electrical effects, survey of lines, erection of poles and towers, drawing conductors, Such knowledge of the pre-requisite for these fields will help the students for effective performance of their duties in the relevant fields and it has been given more emphasis on practical aspect rather than theory in teaching learning approach.

SHORT DESCRIPTION

Different systems of transmission; Aspect of transmission system; Mechanical design of overhead lines; support of overhead lines; conductors & conductor materials; Insulators; Effect of sag; Methods for survey of transmission/distribution line route; Voltage distribution of suspension insulator; Corona; Erection of poles drawing

of conductors of overhead lines; Electrical design of overhead line; Resistance of the line conductor; Skin effect of transmission line; Effect of inductance on transmission line; Effect of capacitance of overhead transmission line; Voltage regulation and efficiency of short transmission line.

Learning Outcome (Theoretical)

After Completing the subject, students will be able to:
1. State Transmission and distribution system of electrical power.
2. Illustrate overhead lines.
3. Describe line conductor and conductor materials.
4. State line insulators.
5. Analyze Sag with effect.
6. State survey methods of transmission and distribution line.
7. Explain suspension type insulators.
8. Interpret the effects of transmission line.
9. Illustrate the methods of erection of pole and tower and laying underground cables.
10. Enumerate voltage regulation & efficiency of short transmission line.

Learning Outcome (Practical)

After undergoing the subject, students will be able to:
1. Make a table for size of conductor by considering same distance and voltage level.
2. Survey and estimate the electrical loads of an area.
3. Perform the calculation of most economical power factor.
4. Identify the different components of LT and HT overhead lines.
5. Observe different types of conductors.
6. Observe and sketch different types of insulators.
7. Measure the horizontal distance between two poles/ towers.
8. Perform the measurement of the angles and heights of poles and towers.
9. Measure sag between two poles/ towers.
10. Sketch the single line diagram of electrical power system.

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
	01	Understand different systems of transmission of electrical power.	1.1 Explain the transmission and distribution system of electrical power. 1.2 Categorize various systems of transmission and distribution of electrical power.	After the Class, Students will be able to know about the concept of transmission and distribution line	Basic Class Materials & Projector YouTube Link: https://www.youtube.
	02	Understand different systems of transmission of electrical power.	1.3 Define Feeder and Distributor. 1.4 Compare between Feeder & Distributor. 1.5 Distinguish between overhead and underground transmission and distribution system. 1.6 Explain the advantages of high voltage transmission over low voltage transmission. 1.7 Compare the cost of conductor of different overhead systems. 1.8 Compare the cost of conductor of underground system with overhead system. 1.9 Describe the process of choosing the working voltage for transmission and distribution system. 1.10 Calculate the most economic working voltage for transmission of electrical power.	After the Class, Students will be able to know about the concept of economic working voltage and different overhead system.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=bZ https://www.youtube.com/watch?v=N

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
	03	Perceive different aspects of transmission system.	2.1 Express the equation for the most economic size of conductor using Kelvin's law. 2.2 Describe the limitations of the application of Kelvin's law to find out the economic size of the conductor. 2.3 Solve problems on Kelvin's law. 2.4 Explain the term system losses	After the Class, Students will be able to know about the kelvin's law and related problems,	Basic Class Materials & Projector YouTube Link: https://www.youtube.
	04	Lab -1	MAKE A TABLE FOR SIZE OF CONDUCTOR BY CONSIDERING SAME DISTANCE AND VOLTAGE LEVEL	After the Practical Class, Students will be able to know about the TABLE FOR SIZE OF CONDUCTOR	
	05	Perceive different aspects of transmission system	2.5 List the factors involved in system loss. 2.6 Explain how the system losses can be minimized. 2.7 Discuss the most economic power factor. 2.8 Derive the equation for most economic power factor. 2.9 Solve problems on most economic power factor.	After the Class, Students will be able to know about the system loss & economic power factor.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=z4
	06	Recognize the supports of overhead lines.	3.1 Mention the main components of overhead lines. 3.2 Categorize the line supports. 3.3 Describe different types of line supports. 3.4 Mention the characteristics of line supports.	After the Class, Students will be able to know about the supports of overhead lines.	Basic Class Materials & Projector YouTube Link: https://www.youtube.

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		Assignment -01	chapter: 01,02,03		1. Must be submitted within
	07	Review Class	Review Class of Lecture 1,2,3	Through the review class, students can solve their problem.	Basic Class Materials
	08	Quiz Test 1	Examination Topic: Chapter 1,2,3 Examination mark: 10 Passing Mark: 04	Through Quiz Test students will learn the intellectual intelligence on the topics discussed.	1) Basic Class Materials 2) Examination Copy
	09	Interpret the conductors and conductor materials.	4.1 List different types of line conductors used in overhead transmission and distribution lines. 4.2 Mention at least five properties of conductor materials. 4.3 Compare the properties of Copper, Aluminum and ACSR conductors.	After the Class, Students will be able to know about the conductor used in overhead lines.	Basic Class Materials & Projector YouTube Link: https://www.youtube.
	10	Class Test -1	Examination Topic: Chapter 1&2 Examination mark: 10 Passing Mark: 04	Through class tests students will learn to evaluate themselves on their own	1) Basic Class Materials 2) Examination Copy
		Lab -2	SURVEY AND ESTIMATE THE ELECTRICAL LOADS OF AN AREA	After the Practical Class, Students will be able to know ELECTRICAL LOADS OF AN AREA	
	11	Realize the line insulators and their characteristics.	5.1 List different types of insulators. 5.2 Specify various types of insulating materials. 5.3 Describe the properties of insulating materials. 5.4 Explain the Pin and Suspension type insulators.	After the Class, Students will be able to know about the line insulator types and test of insulator.	Basic Class Materials & Projector YouTube Link: https://www.youtube. https://www.youtube.com/watch?v=W

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
			5.5 Compare the advantages and disadvantages of Pin and Suspension type insulator. 5.6 Mention the uses of different types of insulators. 5.7 List the causes of failure of insulators. 5.8 Explain different types of test of insulators.		
	12	Understand sag and its effect.	6.1 Explain the sag of transmission line. 6.2 List the factors affecting the sag. 6.3 Explain the spacing between conductors and span length. 6.4 Derive the formula to calculate the sag of conductors between two poles of equal height. 6.5 Derive the formula to calculate the sag of conductors between two poles of unequal Heights considering effect of ice and wind pressure. 6.6 Solve problems on sag of transmission lines. 6.7 Explain the effects of vibration on the transmission line and prevention of vibration. 6.8 Describe the measure for the prevention of vibration.	After the Class, Students will be able to know about the sag of transmission line.	Basic Class Materials & Projector YouTube Link: https://www.youtube.
				After the Class, Students will be able to know about the effects of vibration on the transmission line and prevention of vibration.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=jb

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
	Lab-3	Prepare the layout diagram of an electrical project.	Draw the layout of the selected electrical project. Sketch the complete wiring diagram of the electrical project showing transmission line, distribution line and service mains. Indicate the energy source.		Drawing Tools Needed
Assignment-2		Sag and its effect.	Chapter 4 & 5	To build up their confidence level and increase creativity on Chapter-4	
	13	Perceive the methods for survey of transmission / distribution line route. .	7. List the Surveying Instruments required to survey of transmission / distribution lines. 7.2 Explain the uses, errors and accuracy of surveying instruments. 7.3 Describe the process of measuring the angles by compass, level and Theodolite. 7.4 Enumerate leveling, alignment, surveying and pegging of the route. 7.5 Explain the methods of measuring vertical and horizontal heights of T/D. 7.6 List the principle factors in routing overhead energy lines.	After the Class, Students will be able to know about the use & Principle of theodolite	Basic Class Materials & Projector YouTube Link: https://www.youtube.

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
	14	Understand the voltage distribution of suspension insulator.	8.1 Explain string efficiency. 8.2 Describe the methods of improving string efficiency. 8.3 Solve problems on string efficiency. 8.4 Deduce the equation of voltage distribution across each unit of a string of suspension insulators.	After the Class, Students will be able to know about the voltage distribution across each unit of a string of suspension insulators.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=Ku
	15	Understand the voltage distribution of suspension insulator.	8.5 Describe the methods of voltage grading in suspension insulators. 8.6 Illustrate the methods of equalization of voltage of suspension insulators by guard ring. 8.7 Solve problems on voltage distribution and voltage grading.	After the Class, Students will be able to know about the voltage distribution and voltage grading.	Basic Class Materials & Projector YouTube Link: https://www.youtube.
	16	Review Class	Review Class of Lecture 09-14 (Regarding students' problem)	Through the review class, students can solve their problem.	Basic Class Materials
	17	Quiz Test 2	Examination Topic: Chapter 5,6,7,8 Examination mark: 10 Passing Mark: 04	Through Quiz Test students will learn the intellectual intelligence on the topics discussed.	3) Basic Class Materials 4) Examination Copy
	Lab-4	Perform the identification of different components of LT and HT overhead lines.		Visit the Overhead Line & Measurement Tape	

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments	
	18	Exam Syllabus Review				
	19	Class Test 2				Examination To Examination m Passing Mark: (
	20	Understand the phenomenon of corona.	9.1 Define corona of overhead transmission line. 9.2 Discuss the effect of corona. 9.3 Explain at least four factors that affect corona. 9.4 Describe the advantages and disadvantages of corona. 9.5 Express the derivation of the relation for disruptive critical voltage, visual critical Voltage and energy loss due to corona. 9.6 Discuss the methods for minimizing corona.	After the Class, Students will be able to know about the corona of overhead transmission line.	Basic Class Materials & Projector YouTube Link https://www.youtube.com/watch?v=Tg	

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
Assignment-2		About various insulator.	Chapter 5 & 6	To build up their confidence level and increase creativity on Chapter-5	
	21	Recognize the erection of poles / towers and drawing of conductors of overhead line.	10.1 Describe the procedure of erection of poles of overhead transmission / distribution line. 10.2 Explain the procedure of erection of towers of overhead transmission line. 10.3 Describe the procedure of fixing cross arm and insulator. 10.4 Interpret the drawing of conductors of overhead lines. 10.5 Narrate the erection of stay / guy wire.	After the Class, Students will be able to know about the procedure of erection of poles of overhead transmission	Basic Class Materials & Projector YouTube Link https://www.youtube.c
	22	View the resistance of line conductor. Understand the skin effect of transmission line.	11.1 Describe the line constants of transmission line. 11.2 Express the deduction of the equation for calculating resistance of the line conductor. 11.3 Solve problems on the resistance of the line conductor.	After the Class, Students will be able to know about the resistance of line conductor.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=m
			12.1 Explain the skin effect of transmission line. 12.2 Express the equation for calculating skin effect. 12.3 Describe the proximity effect.	After the Class, Students will be able to know about the skin effect of transmission line.	Basic Class Materials & Projector YouTube Link: https://www.youtube.
	Lab-5	Perform the measurement of the horizontal	Measure the horizontal distance between poles over different ground conditions by using tape, chain and Total station		Visit The overhead lines in the roa

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
		distance between			
	23	Realize the effect of inductance on transmission line.	13.1 Explain the flux linkage of a conductor due to internal and external flux. 13.2 Express the deduction of the equation for inductance of a single phase and three phases overhead transmission line in terms of Geometrical Mean Distance (GMD) and Geometrical Mean Radius (GMR). 13.3 Solve problems on inductance of single phase and three phase lines. 13.4 Describe the inductance of three-phase line with double circuit. 13.5 Explain the transposition of line conductors.	After the Class, Students will be able to know about the concept of inductance on transmission line.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=P https://www.youtube.com/watch?v=U
Assignment-3		Transmission	Chapter 8	To build up their confidence level and increase creativity on Chapter-8	

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	24	Review Class	Review Class of Lecture 09-13 (Regarding students' problem)	Through the review class, students can solve their problem.	Basic Class Materials
	25	Quiz Test 3	Examination Topic: Chapter 9,10,11 Examination mark: 10 Passing Mark: 04	Through Quiz Test students will learn the intellectual intelligence on the topics discussed.	5) Basic Class Materials 6) Examination Copy
	26	Understand the effect of capacitance of overhead transmission line. .	14.1 Explain the electric potential of a transmission line. 14.2 Express the derivation of the equation to calculate the capacitance of single phase and three phase overhead transmission line.	After the Class, Students will be able to know about the capacitance of overhead transmission line.	Basic Class Materials & Projector
	Lab-6	Perform the measurement of the angles and heights of poles / towers by using Theodolite/ Total station.	Select the instruments for measuring angles and heights of poles. Measure horizontal angles. Measure vertical angles. Measure vertical heights of poles / towers.		Visit The overhead lines in the roa
	27	Class Test 3	Examination Topic: Chapter 9,10,11 Examination mark: 20 Passing Mark: 08	Through class tests students will learn to evaluate themselves on their own skill.	5) Basic Class Materials 6) Examination Copy
	28	Understand the effect of capacitance of overhead transmission line.	14.3 Solve problems on capacitance of single phase and three phase overhead transmission line. 14.4 Explain the capacitance of double circuit three phase overhead line.	After the Class, Students will be able to know about the capacitance of overhead transmission line.	Basic Class Materials & Projector

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
	29	Interpret the voltage regulation and efficiency of short transmission line.	15.1 Classify overhead transmission line. 15.2 Express the equation to calculate the voltage regulation of overhead short transmission line. 15.3 Derive the equation to calculate efficiency of overhead short transmission line.	After the Class, Students will be able to know about voltage regulation and efficiency of short transmission line.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=h
	30	Interpret the voltage regulation and efficiency of short transmission line.	15.4 Identify the effect of load energy factor on voltage regulation and efficiency of Overhead short transmission line. 15.5 Draw vector diagram of a short transmission line. 15.6 Solve problems on voltage regulation and efficiency of overhead short transmission line.	After the Class, Students will be able to know about voltage regulation and efficiency of short transmission line.	Basic Class Materials & Projector YouTube Link: https://www.youtube.com/watch?v=xf
	31	Review Class	Review Class of Lecture 29-32 (Regarding students' problem)	Through the review class, students can solve their problem	Basic Class Materials
	32	Quiz Test 4	Examination Topic: Chapter 12,13,14,15 Examination mark: 10 Passing Mark: 04	Through Quiz Test students will learn the intellectual intelligence on the topics discussed.	7) Basic Class Materials 8) Examination Copy
	33	Class Test 4	Examination Topic: Chapter 12,13,14,15 Examination mark: 20 Passing Mark: 08	Through class tests students will learn to evaluate themselves on their own	7) Basic Class Materials 8) Examination Copy

Date	Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipments
	34	Presentation	Short presentation by individual student.	Be confident on practical life.	Laptop, projector
	35	MODEL TEST	All Syllabus	After the Class, Students will be highly confident for Final exam	Basic Class Materials
	36				Final Exam Syllabus Review
	37				Final Exam Syllabus Review
	38				Final Exam Syllabus Review