

Course Name : Electrical Engineering Group

Course Code: EE / EP

Semester : Fourth

Subject Title : Transmission & Distribution
of Electric Power.

Subject Code: 9060

Teaching and Examination Scheme :

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs	TH	TEST	PR	OR	TW	TOTAL
03	01	--	03	80	20	--	--	--	100

Rationale:

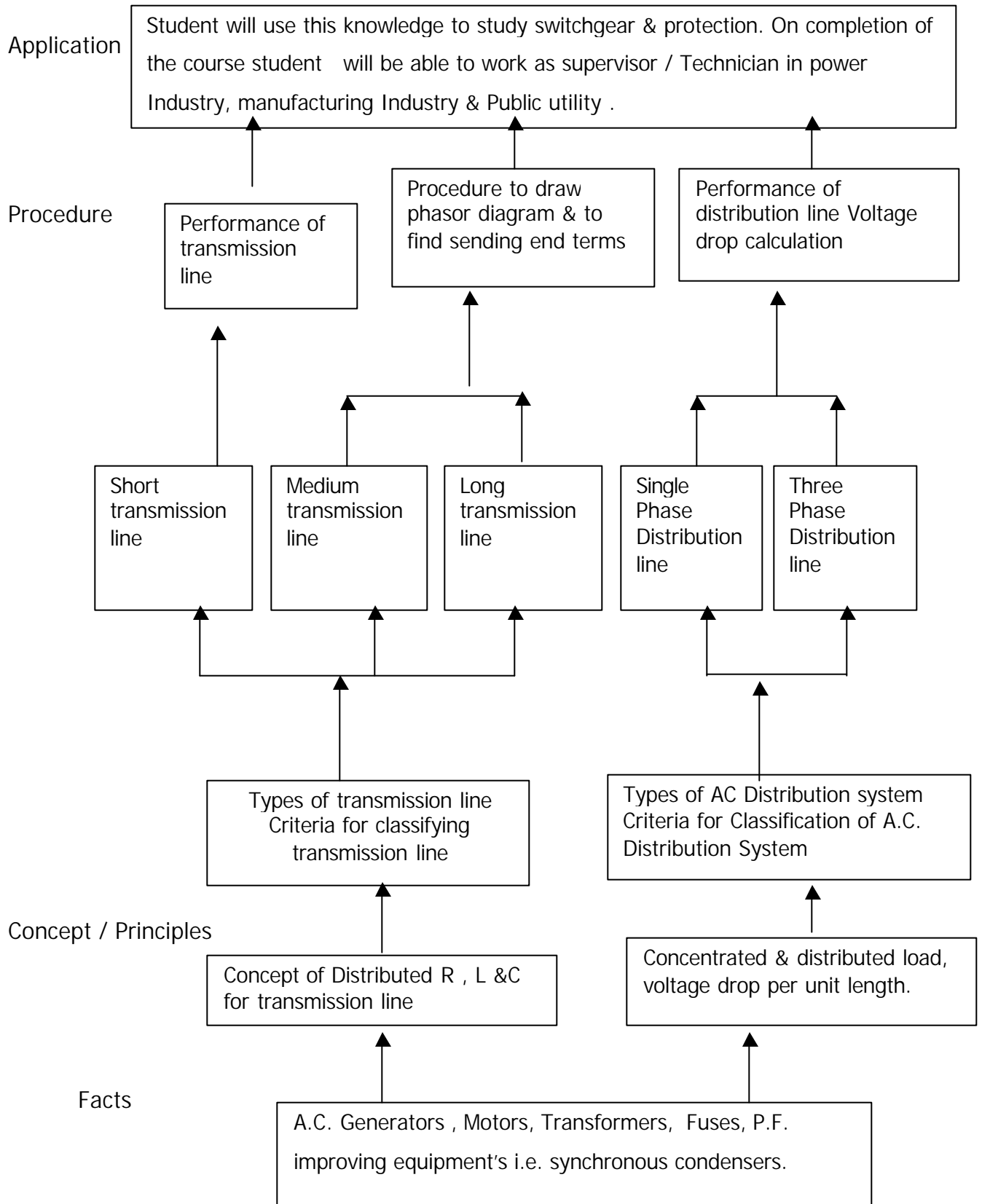
Electrical diploma pass outs should know systems for electrical energy transmission & distribution. They also will be able to identify various components & their functions. They will be able to measure system performance. They will use this knowledge in studying switchgear & protection. On completing the study of generation, transmission & distribution, he/she will be able to work as technician/supervisor in power industry, manufacturing industry & public utilities.

Objective:

The student will be able to:

1. Know various types of transmission & distribution systems.
2. Identify various components & Know their functions.
3. Draw substation layout as per the requirements.
4. Calculate voltage regulation & efficiency of transmission system.
5. Calculate voltage drop of distribution system.

Learning Structure:



Contents : Theory

Chapter	Name of the Topic	Hours	Marks
01	Basics Of Transmission. 1.1 Introduction to transmission. 1.2 Necessity of transmission of electricity. 1.3 Classification & comparison of different transmission systems.	03	04
02	Transmission Line Components. 2.1 Introduction to line components. 2.2 types of conductors-Copper, Aluminum & state their trade names. 2.3 Solid, Stranded & bundled conductors. 2.4 Line supports – requirements, types, and field of applications. 2.5 Line insulators – requirements, types, and field of applications. 2.6 Failure of insulator & reasons of Failure. 2.7 Distribution of potential over a string of suspension insulators. 2.8 Concept of string efficiency, Methods of improving string efficiency. 2.9 Corona – corona formation, advantages & disadvantages, factors affecting corona, important terms related to corona. 2.10 Spacing between Conductors. 2.11 Calculation of Span length & sag Calculation (Numericals based on 2.7 , 2.8 & 2.11)	10	16

03	Transmission Line Parameters 3.1 R,L & C of 1-ph & 3-ph transmission line & their effects on line. 3.2 Skin effect, proximity effect & Ferranti effect. 3.3 Concept of transposition of conductors & necessity.	03	06
04	Performance Of Transmission Line. 4.1 Classification of transmission lines. 4.2 Losses, Efficiency & Regulation of line. 4.3 Performance of single phase short transmission line(Numerical based on it) 4.4 Effect of load power factor on performance. 4.6 Medium transmission lines-End condenser, Nominal T & Nominal π Network with vector diagram. 4.7 General circuit & Generalised Circuit Constants (A, B, C, D)	10	16
05	Extra High Voltage Transmission. 5.1 Introduction & Requirement. 5.2 EHVAC Transmission, Reasons for adoption & limitations. 5.3 HVDC Transmission – Advantages, Limitations.	03	06
06	Components Of Distribution System. 6.1 Introduction. 6.2 Classification of distribution system. 6.3 A.C distribution. 6.4 Connection schemes of distribution system. 6.5 Requirements of Distribution systems. 6.6 Design consideration. 6.7 A.C. distribution calculations. 6.8 Methods of solving A.C.-1 phase & 3 \emptyset -phase	10	16

	connected (balanced) distribution system. (Numericals based on 1-ph & 3-ph balanced distribution system)		
07	Underground Cables. 7.1 Introduction & requirements. 7.2 Classification of cables. 7.3 Cable conductors. 7.4 Cable construction. 7.5 Cable insulation, Metallic sheathing & mechanical protection. 7.6 Comparison with overhead lines 7.7 Cable laying	03	04
08	Substations. 8.1 Introduction. 8.2 Classification of indoor & outdoor sub-stations. 8.3 Advantages & Disadvantages. 8.4 Selection & location of site. 8.5 Main connection schemes. 8.6 Equipment's circuit element of substations. 8.6.1 In coming & outgoing lines, Transformers, CT&PT, Relays, CB's, fuses, Isolators, batteries, lightning arresters. Insulators. 8.6.2 Bus bar's material, types in detail. Connection diagram and layout of sub-stations.	06	12
	Total	48	80

Learning Resources :

Books:

Sr. No.	Name of Book	Author	Publication
1	A Course in electrical power	Soni-Gupta-Bhatnagar.	Dhanpat Rai
2	Principals of power system	V. K. Mehta	S. Chand & Company
3	A Course in electrical power	S. L. Uppal.	S. K. Khanna
4	Transmission & distribution of electrical energy	J. B. Gupta	S. K. Khanna
5	Generation & transmission of electrical energy	A. T. Star	Pitman