

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:

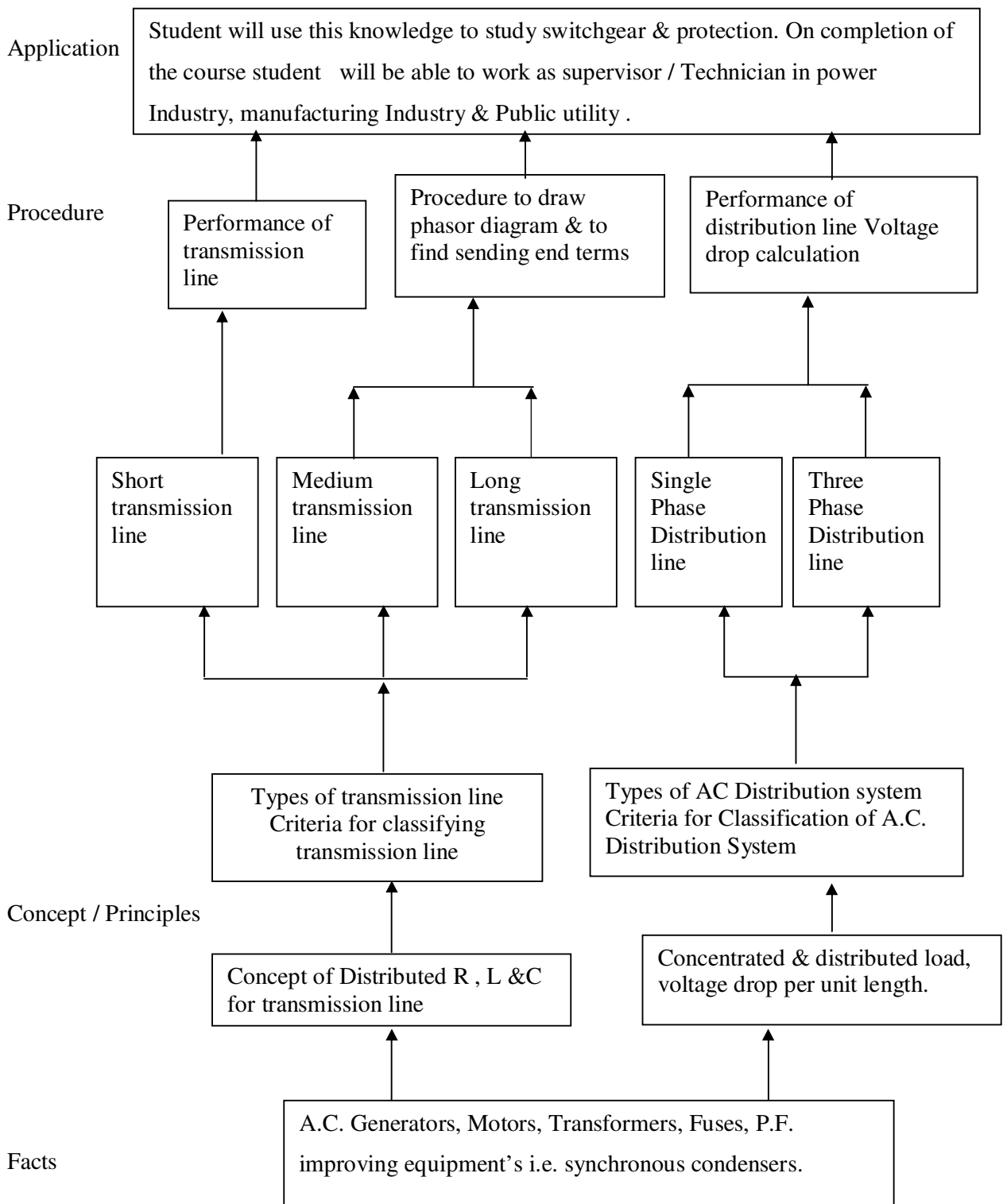
Electrical diploma pass outs should know systems for electrical energy transmission & distribution. They also will be able to identify various components & their functions. They will be able to measure system performance. They will use this knowledge in studying switchgear & protection. On completing 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	Tansmission 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.	10	16

	<p>4.1 Classification of transmission lines.</p> <p>4.2 Losses, Efficiency & Regulation of line.</p> <p>4.3 Performance of single phase short transmission line(Numerical based on it)</p> <p>4.4 Effect of load power factor on performance.</p> <p>4.6 Medium transmission lines-End condenser, Nominal T & Nominal π Network with vector diagram.</p> <p>4.7 General circuit & Generalised Circuit Constants (A, B, C, D)</p>		
05	<p>Extra High Voltage Transmission.</p> <p>5.1 Introduction & Requirement.</p> <p>5.2 EHVAC Transmission, Reasons for adoption & limitations.</p> <p>5.3 HVDC Transmission – Advantages, Limitations.</p>	03	06
06	<p>Components Of Distributrion System.</p> <p>6.1 Introduction.</p> <p>6.2 Classification of distribution system.</p> <p>6.3 A.C distribution.</p> <p>6.4 Connection schemes of distribution system.</p> <p>6.5 Requirements of Distribution systems.</p> <p>6.6 Design consideration.</p> <p>6.7 A.C. distribution calculations.</p> <p>6.8 Methods of solving A.C.-1 phase & 3 \emptyset -phase connected (balanced) distribution system. (Numericals based on 1-ph & 3-ph balanced distribution system)</p>	10	16
07	<p>Underground Cables.</p> <p>7.1 Introduction & requirements.</p> <p>7.2 Classification of cables.</p> <p>7.3 Cable conductors.</p> <p>7.4 Cable construction.</p> <p>7.5 Cable insulation, Metallic sheathing & mechanical protection.</p> <p>7.6 Comparison with overhead lines</p>	03	04

	7.7 Cable laying		
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