4114 – GENERATION & TRANSMISSION

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
Lectures	Practical	Credits			Theory		Practical Ex.	Total
3	-	3	-	25	3 Hrs	100	-	125

Pre-requisite	Source
4104	ELL

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	–	–	100

COURSE CONTENTS	Hrs	Mks
1. GENERATION		
Terms related to generation such as load curve, base load and peak load power plant, pump storage power plant, Demand factor, diversity factor, load factor, Utilisation factor, choice of number and rating of units for a given load curve. Grid system, their merits & demerits.	7	12
Main sources of energy for bulk power generation. Principle of generation and plant layout. Non conventional sources – types of sources for electric power. Availability and Economical Feasibility.	7	12
Stand by Diesel Generator sets. Main components and their functions, (including) various types of speed Governors) Methods of starting (Manual & self start push button , automatic & remote start) Types of Diesel Engines used for power plant, their advantage & disadvantage w.r.t. generation – Characteristics & operation. Cooling system, selection and specification for procurement.Self regulation through compounded excitation system – components, connection diagram and working	6	12
2. TRANSMISSION	8	20
Component of transmission lines, Types of supports (Poles & towers) classification of towers. Types of conductor – study of different types of conductors AAC, ACSR, All Aluminium Alloy conductor, bundled conductors, General Electrical & Mechanical specification. Study of different types of insulators such as-pin type; suspension type; post type, Tension type. Material used. Comparison between pin and suspension insulators. Voltage distribution and string efficiency. Cause of failure of insulators. General specification. H V. EHV. HVDC transmission system their main components (Insulators towers & conductors) and advantages and disadvantages of each system.		
4. PERFORMANCE	12	28
Transmission line parameters (RLC) (No derivation of formula), Concept of short, medium and long transmission, lines, percentages voltage regulation and efficiency. Calculation of voltage regulation & efficiency of short & medium transmission lines. Effect of variation of transmission voltage and load power factor on the performance of short and medium transmission lines, Corona: formation and its advantages and disadvantages. Methods of reduction corona loss.		
5. MECHANICAL DESIGN OF TRANSMISSION LINE:	8	16
Calculation of sag for equal and unequal support (No derivation) check for derived value in conformity with I.E rule, effect of ice deposition & wind on the sag, Types of survey required, plan, profile, erection of tower, fixing of insulators, stringing of conductors, vibration in conductors, their effect and method of reduction (No calculation). Comparative study of various dampers, Construction practices for transmission line.		
Total	48	100

REFERENCE BOOKS:

1. Electric Power by Dr. S.L. Uppal
2. Electric Power System by C. L. Wathwa
3. Electric Power System Design by M.V. Deshpande
4. Elements Of Electric Power Station Design by M. V. Deshpande.
5. Generation, Transmission & Distribution by H. Cotton.