



# Maharaja Agrasen Institute of Technology

(Approved by AICTE & Affiliated to GGSIP University, New Delhi)

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## Department of Electrical & Electronics Engineering

### Power Systems-I Theory (EEC212)

#### ACADEMIC PLAN FOR SEMESTER-IV 2022

S.No.	TOPICS TO BE COVERED	Total No. of Lectures (42)	CO
<b>UNIT-I(Power System Components and Transmission Lines)</b>			
1	Block diagram of electrical power system, Single line diagram of power system, brief description of power system elements such as synchronous, machine, transformer, transmission line, bus bar and circuit breaker.	2	CO 1
2	Configuration of Transmission Lines and types of conductors.	1	
3	Mechanical Design of Transmission Line: catenary curve, calculation of sag and tension, effects of wind and ice loading on sag.	3	
4	Sag Template, Vibration Dampers; Overhead Lines Insulators: Types of insulators and their applications.	1	
5	Potential Distribution over a string of Insulators, Methods of equalizing the potential.	3	
<b>UNIT-II (Overhead Transmission Lines)</b>			
7	Corona and Interference: Phenomenon of corona, corona loss, factors affecting corona, methods of reducing corona, bundle conductors and Interference.	3	CO 2
8	Calculation of resistance (skin & proximity effects), Inductance and capacitance of single phase, three phase, single circuit and double circuit transmission lines.	3	
9	Modelling and performance analysis of short, medium, and long transmission line.	3	
10	Ferranti effect, Transposition of transmission conductors, surge impedance loading.	1	
11	Introduction and analysis of travelling wave using Bewley's Diagram	1	
<b>After Mid Term</b>			
<b>UNIT-III(Insulated Cables and Fault Analysis)</b>			
13	Types of cables, and Dielectric Stress.	1	
14	Grading of Cables, Insulation Resistance.	3	

15	Capacitance of single phase and three phase cables, Dielectric loss, and Heating of Cables.	3	CO 3
16	Fault Analysis: Per Unit System, and Symmetrical Components	2	
17	Fault Analysis: Calculation of Symmetrical and Unsymmetrical Fault, and use of Current Limiting Reactors	3	
<b>UNIT-IV(Power Flow Analysis)</b>			
18	Formulation of Y-bus Matrix, Power flow Equations.	2	CO 4
19	Classification of Buses, Data for Load Flow	1	
20	Gauss-Seidel Method, and Acceleration Factor of Convergence in Power Flow Analysis.	2	
21	Newton-Raphson Method for Power Flow Analysis.	2	
22	Fast Decoupled Load Flow Analysis, Comparison of Power Flow Methods	2	

### Course Objectives

C.212.1	To impart the knowledge of transmission line parameter.
C.212.2	To impart the knowledge of transmission line.
C.212.3	To impart the knowledge of cables.
C.212.4	To impart the knowledge of load flow studies.