DEPARTMENT OF ELECTRICAL ENGINEERING
RAJASTHAN TECHNICAL UNIVERSITY, KOTA
"2015-16 -- LECTURE PLAN" -- "1MPS1, POWER SYSTEM ANALYSIS"
FIRST SEMESTER, M. TECH.; POWER SYSTEM SPECIALIZATION
Teacher -- Dr. Dinesh Birla

	Chapter Title	Lectures	Contents of the Lectures
1	**Fault Analysis**	1	Introduction: causes and types of faults, fault calculation, bus impedance matrix, load flow
		2	Fortscue theorem and Sequence components
		3	Sequence networks and LG fault analysis
		4	LL fault analysis, LLG fault analysis intro
		5	LLG and simultaneous fault analysis, Per Unit system intro
		6	Advantages of Per Unit system, Representing Three Phase system on Single line diagram
		7	Representing network elements on Single line diagram, 2 and 3 winding Transformers
		8	Problem Solving on per unit system fault analysis calculations
2	**Admittance and Impedance Model and Network Calculations**	9	Y-bus impedance matrix constitution
		10	Fault calculations using Z-bus
		11	LG, LL Fault calculations using Z-bus
		12	LLG, 3-phase Fault calculations using Z-bus
		13	Current injection method of building Z-bus
		14	Bus incidence matrix, Primitive matrixes, Performance equations
		15	Step by step method Intro and Type-1 & 2 case of method for building Z-bus
		16	Type-3 & 4 case of method for building Z-bus
		17	Problem Solving
3	**Load Flow Studies**	18	Introduction -- Formulation of Load Flow Problem
		19	Gauss-Seidal method introductory concepts
		20	Gauss-Seidal method iterative description
		21	Gauss-Seidal method when all buses are PQ bus
		22	Gauss-Seidal method when at least a bus is PV bus
		23	NR method intro
		24	NR method iterative description
		25	Fast Decoupled load flow method
		26	Comparison of Load Flow Methods
		27	Numericals on Load Flow methods

		28	Problem Solving
4	**Representation of transformers**	29	Calculation of reactive power at voltage controlled buses in GS method
		30	Introduction -- Representation of transformers
		31	Y-bus in Tap changing transformers
		32	Fixed tap setting transformer
		33	Tap changing under load condition
		34	Phase shifting transformers
		35	Numerical problems
5	**Power System Security and State Estimation**	36	Introduction to Power System Security
		37	Concepts of security states
		38	Security analysis in power system
		39	Introduction to State Estimation
		40	State estimation in power system