

POWER SYSTEM COMPUTATIONAL LABORATORY

I Semester: EPS								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BPSB09	Core	L	T	P	C	CIA	SEE	Total
		-	-	4	2	30	70	100
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 36			Total Classes: 36	
<p>COURSE OBJECTIVES: The course should enable the students to: I. Construct Y bus, Z bus for a n bus system and analyze various load flow studies. II. Understand the steady state, transient stability analysis and economic load dispatch problem. III. State estimation of power system and unit commitment problem</p> <p>COURSE LEARNING OUTCOMES (CLOs): The students should enable to:</p> <ol style="list-style-type: none"> 1 Develop a MATLAB program for $[Y]_{bus}$ formation by direct inspection method and singular transformation method. 2 Estimate the steady state parameters in power system is by Gauss -Seidal load flow method, Newton - Raphson load flow method, Fast Decoupledload flow method and DC Load Flow 3 Construct Z_{BUS} matrix which is a prerequisite to analyze the power system in case of fault 4 Determine a MATLAB program for short circuit analysis 5 Determine the economic operation of power systems through economic load dispatch. 6 Recognize the optimal number of generators to supply the load demand by means of unit commitment 7 Estimate the state of electrical power system. 								
LIST OF EXPERIMENTS								
Expt. 01	FORMATION OF BUS ADMITTANCE MATRIX							
Develop program for Y_{bus} formation by direct inspection method.								
Expt. 02	SINGULAR TRANSFORMATION							
Develop program for Y_{bus} formation by singular transformation method.								
Expt. 03	GAUSS - SEIDAL LOAD FLOW METHOD							
Develop program for G-S load flow algorithm								
Expt. 04	NEWTON - RAPHSON LOAD FLOW METHOD							
Develop program for N-R load flow algorithm in polar coordinates								
Expt. 05	FAST DECOUPLED LOAD FLOW METHOD							
Develop program for FDLF algorithm.								

Expt. 06	DC LOAD FLOW
Develop program for DC load flow algorithm.	
Expt. 07	BUILDING ALGORITHM
Develop Program for Z_{BUS} building algorithm.	
Expt. 08	SHORT CIRCUIT ANALYSIS
Develop program for short circuit analysis using Z_{BUS} algorithm.	
Expt. 09	TRANSIENT STABILITY
Develop program for transient stability analysis for single machine connected to infinite bus	
Expt. 10	LOAD DISPATCH PROBLEM
Develop program for economic load dispatch problem using lambda iterative method	
Expt. 11	DYNAMIC PROGRAMMING METHOD
Develop program for unit commitment problem using forward dynamic programming method.	
Expt. 12	STATE ESTIMATION
Develop program for state estimation of power system.	
Reference Books:	
<ol style="list-style-type: none"> 1. DP Kothari, B S Umre, "Lab manual for Electrical Machines", IK International Publishing House Pvt. Ltd, 1st Edition, 1996. 2. MariesaLCrow, "Computational Methods for Electric Power Systems (Electric Power Engineering Series)", CRC Press Publishers, 1st Edition, 1992. 	
Web References:	
<ol style="list-style-type: none"> 1. https://www.ee.iitkgp.ac.in 2. https://www.citchennai.edu.in 3. https://www.iare.ac.in 4. https://www.deltaww.com 	