ARTIFICIAL INTELLIGENCE IN POWER SYSTEM LABORATORY

II Semester: EPS								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BPSC23	**Core**	-	-	4	2	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 36**				**Total Classes: 36**		

I. COURSEOVERVIEW:

This course deals with the load flow analysis, state estimation and other power system problems. It will also evaluate the economic dispatch of coordinated thermal unit. This course also concludes with artificial intelligence technique like fuzzy logic artificial neural networks and GA algorithms.

II. COURSE OBJECTIVES:

The students will try to learn:

I. Different state estimation techniques.
II. Artificial intelligence technique for a given Power System problem.
III. Economic dispatch of coordinated thermal unit
IV. Modern tools like fuzzy logic, artificial neural networks and ANFIS for power system problems
V. Various evolutionary algorithms to power system problems.

III. COURSE OUTCOMES:

After successful completion of the course, students will be able to:

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CO 1	**Develop** a neural network based model for Load flow analysis..	Remember
CO2	**Analyze** the state estimations using neural network.	Remember
CO 3	**Analyze**contingencytechniquetopredicttheeffectofoutageslikefailuresofe quipment, transmission line using ANN	Remember
CO 4	**Apply** the power system security using neural network.	Analyse
CO 5	**Determine** automatic Generation Control for singlear easy stem and two area systems using Fuzzy Logic Method.	Analyse
CO 6	**Analyze** the transient and small signal stability analysis of Single-Machine-Infinite Bus(SMIB) system using Fuzzy Logic	Apply

IV. LIST OF EXPERIMENTS

EXPERIMENT –I: LOAD FLOW ANALYSIS

Load flow analysis using neural network.

EXPERIMENT –II: STATE ESTIMATIONS

State estimations using neural network.

EXPERIMENT –III: CONTINGENCY ANALYSIS

Contingency analysis using neural network.

EXPERIMENT –IV: POWER SYSTEM SECURITY

Power system security using neural network.

EXPERIMENT –V: AGC - SINGLE AREA SYSTEM / TWO AREA SYSTEM

Fuzzy logic based AGC for single area system and two area systems.

EXPERIMENT –VI: SMALL SIGNAL STABILITY ANALYSIS
Fuzzy logic based small signal stability analysis.

EXPERIMENT –VII: ECONOMIC DISPATCH THERMAL UNITS
Economic dispatch of thermal units using conventional and ANN algorithms.

EXPERIMENT –VIII: ECONOMIC DISPATCH THERMAL UNITS
Economic dispatch of thermal units using conventional and GA algorithms.

EXPERIMENT –IX: ECONOMIC DISPATCH THERMAL UNITS
Economic dispatch of thermal units using conventional and Fuzzy logic.

EXPERIMENT –X: ECONOMIC DISPATCH OF THERMAL PLANTS

EXPERIMENT –XI: ECONOMIC DISPATCH OF THERMAL PLANTS
Economic dispatch of thermal plants using conventional and GA algorithms.
Economic dispatch of thermal plants using conventional and ANN algorithms.

EXPERIMENT –XII: ECONOMIC DISPATCH OF THERMAL PLANTS
Economic dispatch of thermal plants using conventional and Fuzzy logic.

V. References:

1. Chakrabarti, Abhijit, "Power System Dynamics and Simulation", PHI Learning, 2nd Edition, 2012.
2. Barret J P, "Power System Simulation", Chapman and Hall, 2nd Edition, 2013.

VI. Web Reference:
1. http://www.iare.ac.in