INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

ARTIFICIAL INTELLIGENCE IN POWER SYSTEMS LABORATORY								
II Semester: EPS								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BPSD23	**Core**	-	-	4	2	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes:36**				**Total Classes: 36**		
Prerequisite: -								

I. COURSE OVERVIEW:

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. COURSES 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 should be able to:

CO1 Develop a neural network-based model for Load flow analysis.

CO2 Analyze the state estimations using neural network.

CO3 Analyze contingency technique to predict the effect of outages like failures of equipment, transmission line using ANN

CO4 Apply the power system security u s i n g neural network.

CO5 Determine automatic Generation Control for single are a system and two area systems using Fuzzy Logic Method.

CO6 Analyze the transient and small signal stability analysis of Single- Machine-Infinite Bus (SMIB) system using Fuzzy Logic

IV. LIST OF EXPERIMENTS

WEEK –1: LOAD FLOW ANALYSIS

Load flow analysis using neural network.

WEEK –2: STATE ESTIMATIONS

State estimations using neural network.

WEEK –3: CONTINGENCY ANALYSIS

Contingency analysis using neural network.

WEEK –4: POWER SYSTEM SECURITY
Power system security using neural network.

WEEK –5: AGC - SINGLE AREA SYSTEM / TWO AREA SYSTEM
Fuzzy logic based AGC for single area system and two area systems

WEEK –6: SMALL SIGNAL STABILITY ANALYSIS
Fuzzy logic based small signal stability analysis.

WEEK –7: ECONOMIC DISPATCH THERMAL UNITS
Economic dispatch of thermal units using conventional and ANN algorithms.

WEEK –8: VIII: ECONOMIC DISPATCH THERMAL UNITS
Economic dispatch of thermal units using conventional and GA algorithms.

WEEK –9: ECONOMIC DISPATCH THERMAL UNITS
Economic dispatch of thermal units using conventional and Fuzzy logic.

WEEK –10: ECONOMIC DISPATCH OF THERMAL PLANTS
Economic dispatch of thermal plants using conventional and ANN algorithms.

WEEK –11: ECONOMIC DISPATCH OF THERMAL PLANTS
Economic dispatch of thermal plants using conventional and GA algorithms.

WEEK –12: ECONOMIC DISPATCH OF THERMAL PLANTS
Economic dispatch of thermal plants using conventional and Fuzzy logic.

WEEK –13: ECONOMIC DISPATCH OF HYDRO POWER PLANTS
Economic dispatch of thermal plants using conventional and Fuzzy logic

WEEK –14: ECONOMIC DISPATCH OF NUCLEAR PLANTS
Economic dispatch of nuclear plants using conventional and Fuzzy logic

V. TEXT BOOKS:
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.