

# **RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**

## **New Scheme Based On AICTE Flexible Curricula**

### **Electrical & Electronics Engineering, VI-Semester**

#### **EX-601 Power System-II**

##### **UNIT-I**

General - Problems associated with modern interconnected power Systems, deregulation, power systems restructuring, distributed generation, congestion, available transfer capacities, pricing of energy and transmission services.

##### **UNIT-II**

D.C. Machine-II

Power flow studies - Formulation of static power flow equations and solutions using Gauss Seidel, Newton Raphson and FDLF methods, comparison of these methods, Economic operation of power system – Economic dispatch, Emission dispatch, line loss, ITL, economic dispatch using lagrangian multiplier method.

##### **UNIT-III**

MW Frequency control- Fundamental of Speed Governing, Modeling of Speed Control Mechanism, Primary ALFC, Closing of ALFC, Static & Dynamic Response to Primary ALFC, Speed Control Characteristics ,Fundamental of AGC,AGC in Isolated & Interconnected Power Systems, Modeling of the Tie line, Static & Dynamic response of two area system, Economic dispatch Control.

##### **UNIT-IV**

Reactive Power & Voltage control –Protection & Absorption of Reactive Power Method of Voltage Control , Static VAR systems, Different types, Application ,characteristics, characteristics of an excitation system, DC AC and static excitation system, General block diagram representation of voltage regulators.

##### **UNIT-V**

Power System Stability - Steady state, dynamic and transients stability, Swing equation , equal area criterion, solution of swing equation using step by step method modified Eulers method and Runge-Kutta method, methods of improving transient stability.

##### **REFERENCE BOOKS**

1. I.J. Nagrath & D.P. Kothari , Modern Power System Analysis, Tata Mc Graw – Hill Publication Company Ltd 2nd edition.
2. C.L. Wadhwa, Electrical Power Systems, New Age International (P) Limited Publishers, 2nd edition 1998.
3. T.J.E. Miller , Reactive power Control in Electric Systems, John Wiley & Sons.
4. A Chakrawarti, Power System Analysis: Operation and Control PHI Learning 3rd edition
5. Elgerd O.I., “Electric Energy Systems Theory”, TMH, New Delhi, Second Edition 1983.
6. Prabha Kundur, “Power system stability and control”, Mc-Graw Hill Inc, New York, 1993.
7. Taylor C.W., “Power System Voltage Stability”, Mc-Graw Hill Inc, New York, 1993.

8. Nagrath IJ, Kothari D.P., "Power System Engineering", Tata Mc-Graw Hills, New Delhi 1994.
9. Weedy B.M. "Electric Power System" John Wiley and Sons, 3rd edition.
10. P.S.R. Murthy, "Power System Operation and Control", B S Publication
11. Power Generation, Operation and Control by A.J. wood and B.F. Wollenberg John Wiley & Sons Inc. 1984.
12. T.K. Nagsarkar, M.S. Sukhiza, -"Power System Analysis", Oxford University Press.
13. Economic Operation of Power Systems- by L.K. Kirchmayer Wiley Eastern Ltd.

#### **LIST OF EXPERIMENTS (EXPANDABLE)**

1. To develop a program in MATLAB for information of Y-bus matrix for N bus system.
2. Load flow solution for 3-bus system using Gauss- Seidel, Newton Raphson and FDLF methods up to 3 iteration.
3. Load flow solution for IEEE 6-bus and 30-bus system in MATLAB using Newton Raphson method.
4. Assessment of transient stability of a single machine system.
5. Effect of compensation on voltage profile of IEEE 6-bus system.
6. Study of any software tools (PSCAD,EDSA, Mi POWER, ETAP etc)