4/4 B.Tech. EIGTH SEMESTER

EE8T2A   POWER SYSTEMS DYNAMICS & STABILITY   Credits: 3

Lecture: 3 periods/week   Internal assessment: 30 marks
Tutorial: 1 period /week   Semester end examination: 70 marks

Course Objective:

To study the modeling of synchronous machine, stability analysis, multi machine stability and different excitation system

Course Outcomes:

After completing the course the student
1. Able to understand modeling of synchronous machine, induction motor and load.
2. Able to understand the system dynamics.
3. Able to understand stability, stability limits, multimachine stability
4. Able to understand excitation systems in power system

Unit I

System Dynamics and Synchronous machine model in state space form, computer representation for excitation and governor systems, modeling of loads and induction machines.

Unit II

Stability and stability limit, steady state stability limit, transient state stability limit, dynamic stability limit, transient state stability studies.

Unit III

State space representation of synchronous machine connected to infinite bus, concept of multi machine stability, multi machine transient stability under different faulted conditions.

Unit IV

Excitation systems- rotating self-excited exciter with direct acting rheostatic type voltage regulator – rotating main and pilot exciters with indirect acting rheostatic type voltage regulator.

Unit V

Rotating main exciter rotating amplifier and static voltage regulator – static excitation scheme – brushless excitation system.

Learning Resources

Text Books:

1. Power System control and stability by Anderson and Fund, Galgotia Publications, 1981, 1 st edition.
2. Power System Dynamics Stability and Control by K.R.Padiyar, Second edition B.S.Publications 2002.
3. Power System Analysis by ,Hadi Saadat, Tata McGraw Hill Publications
4. Advanced power system analysis and dynamics by L.P.Sing, 5th edition, New age International publishers

Reference Books:

1. Power System Stability by Kimbark Vol. I&II, III , Dover Publication Inc, New York 1968.
2. Computer Applications to Power Systems by Glenn.W.Stagg & Ahmed. H.El.Abiad
3. Power Systems Analysis & Stability by S.S.Vadhera Khanna Publishers.