

## **17PS1206 - POWER SYSTEM DYNAMICS & STABILITY**

Instruction/week: 4 hrs.

Max. Sessional marks: 40

Univ. Exam: 3 hrs.

Univ. Exam marks: 60

### **UNIT-I**

**INTRODUCTION:** System model, Analysis of steady state stability, Analysis of transient stability.

### **UNIT-II**

**MODELING OF SYNCHRONOUS MACHINE:** Introduction, synchronous machine, Park's Transformation, Analysis of steady state performance, per unit quantities.

### **UNIT-III**

**EXCITATION AND PRIME MOVER CONTROLLERS:** Excitation system, Excitation system modeling, Excitation systems- standard block diagram, system representation by state equations.

### **UNIT-IV**

**DYNAMICS OF A SYNCHRONOUS GENERATOR CONNECTED TO INFINITE BUS:** System model, synchronous machine model, application of model 1.1, calculation of Initial conditions.

### **UNIT-V**

Small signal Analysis with block diagram representation, characteristic equation and application of Routh-Hurwitz criterion, synchronizing and damping torques analysis, small signal model : state equations.

**APPLICATION OF POWER SYSTEM STABILIZERS:** Introduction, Basic concepts in applying PSS, control signals.

### **TEXT BOOKS:**

1. "Power system dynamics, stability and control" by KR Padiyar, BS Publications
2. "Power system stability & control" by P. Kundur, Tata Mc-Graw Hill Professional.

### **REFERENCES:**

1. "Power system dynamics and stability" by Peter. W. Sauer & M.A. Pai, Stipes Publishing L.L.C 2006
2. "Power system stability Vol. I and III" by E.W. Kimbark, John Wiley and sons.