POWER SYSTEM DYNAMICS, CONTROL AND MONITORING

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Department of Electrical Engineering
IIT Kharagpur

TYPE OF COURSE : Rerun | Elective | UG/PG
COURSE DURATION : 12 weeks (24 Jan' 22 - 15 Apr' 22)
EXAM DATE : April 24, 2022

PRE-REQUISITES : Power System Analysis (UG)

INTENDED AUDIENCE : Electrical Engineering

INDUSTRIES APPLICABLE TO : NTPC, DVC, BHEL, Powergrid, NHPC

COURSE OUTLINE :
This course is both for undergraduate and postgraduate Electrical Engineering students. This course will introduce and explain the concepts of synchronous machine modeling, reference frame transformation, automatic voltage regulation, power system stabilizer, transient stability for multimachine system, automatic generation control under deregulated environment, state estimation, eigenvalue and participation factor analysis. By the end of the course, the students should be able to gather high-quality knowledge on stability, operation and control of power systems.

ABOUT INSTRUCTOR :
Prof. Debapriya Das obtained his B.E. degree from Calcutta University (B.E. College (Presently known as IIEST), Shibpur, Howrah, WB), M.Tech. from I.I.T. Kharagpur and Ph.D. from I.I.T., Delhi. He has nearly thirty years of experience in teaching and research. For more information, one can visit my I.I.T KGP website. One can also visit the website https://scholar.google.co.in/citations?user=yZj2uFYAAAAJ.

COURSE PLAN :

Week 1 : Basic concepts of power system stability and synchronous machine
Week 2 : Synchronous machine modeling
Week 3 : Synchronous machine modeling in d-q reference frame
Week 4 : Per unit system for Synchronous machine
Week 5 : Steady state analysis : Voltage, current and flux linkage relationships
Week 6 : Generator representation by classical model, swing equation and block diagram development
Week 7 : Automatic voltage regulator (AVR) and Power system stabilizer (PSS)
Week 8 : Eigenvalue and participation factor analysis
Week 9 : Transient stability analysis
Week 10 : AGC under deregulated environment
Week 11 : AGC under deregulated environment
Week 12 : State Estimation