EE 513- Control Application in Power Engineering

CREDIT HOURS
3 Hours

CONTACT HOURS (Hours/week)
Lecture: 2; Tutorial: 2

COURSE COORDINATOR
Dr Hassan Ibrahim

TEXT BOOK:
Lecturer Notes

COURSE DESCRIPTION:
Control problems in electrical power system. An introduction to Modeling of turbines and synchronous machine using state space approach. Linearized simulation on model in the s-domain of one machine connected to infinite-bus system. Dynamic performing of the controlled one machine / infinite - bus system Excitation control problem: definition and control configuration of classical and modern systems. Transfer function model excitation system Excitation system compensation (power system stabilizer) Effect excitation system on generator steady – state stability limit and dynamic stabilization. Generation control problem: definition and element modeling. Power factor-control of isolated system using PID controller. Power factor-control of two area system

PREREQUISITE:
EE 411

RELATION OF COURSE TO PROGRAM:
Elective

COURSE INSTRUCTION OUTCOMES:
The student gain skills related to the subject of control problems and their application in power system engineering

TOPICS COVERED:

- Control problems in electrical power system.
- Modelling system components in power system dynamics.
- Excitation control systems QV control.
- Generation control systems PF control.

CONTRIBUTION OF COURSE TO MEET THE REQUIREMSNTS OF CRITERION 5:

Professional Component Content			
Math and Basic Sciences	**Engineering Topics**	**General Education**	**Engineering Design**
	√	√	√

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course Outcomes
a.	An ability to apply knowledge of mathematics, science, and engineering.	
b.	An ability to design and conduct experiments, analyze and interpret data.	
c.	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	√
d.	An ability to function on multi-disciplinary teams.	
e.	An ability to identify, formulate, and solve engineering problems.	√
f.	An understanding of professional and ethical responsibility.	
g.	An ability to communicate effectively.	
h.	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal content	
i.	A recognition of the need for, and an ability to engage in life-long learning.	
j.	A knowledge of contemporary issues within and outside the electrical engineering profession.	
k.	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	√