

## **EE 441- Power System II**

### **CREDIT HOURS**

3 Hours

### **CONTACT HOURS (Hours/week)**

Lecture: 2; Tutorial: 2

### **COURSE COORDINATOR**

Dr Rania El Sharkawy

### **TEXT BOOK:**

H. Saadat, "Power System Analysis", McGraw-Hill , Latest edition

### **COURSE DESCRIPTION:**

Transients in RL Series Circuits. Internal voltage of loaded machines under faults conditions. Fault calculation using Z bus. The selection of circuit breakers. The symmetrical components of unbalanced phasors. Power in terms of symmetrical components. Sequence circuits of Y &  $\Delta$ . Unsymmetrical faults on power systems and single line to ground faults. Line to line faults and double line to ground faults. The stability problem. Rotor dynamics and swing equation. The power equation and synchronizing power coefficients. Equal-area criterion of stability. Step-by-step solution of the swing curve. Factors affecting transient stability.

### **PREREQUISITE:**

EE 342

### **RELATION OF COURSE TO PROGRAM:**

Required

### **COURSE INSTRUCTION OUTCOMES:**

The student is capable of using different methods of power system analysis and design in sufficient depth for short circuit calculations and stability.

### **TOPICS COVERED:**

- Different methods of power system analysis.
- The selection of circuit breakers.
- Different types of faults affecting power system.
- Study of power system stability under faulty condition.

**CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:**

<b>Professional Component Content</b>			
<b>Math and Basic Sciences</b>	<b>Engineering Topics</b>	<b>General Education</b>	<b>Engineering Design</b>
	✓		

**RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:**

<b>Student Outcomes</b>		<b>Course Outcomes</b>
<b>a.</b>	An ability to apply knowledge of mathematics, science, and engineering.	
<b>b.</b>	An ability to design and conduct experiments, analyze and interpret data.	
<b>c.</b>	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.	
<b>d.</b>	An ability to function on multi-disciplinary teams.	
<b>e.</b>	An ability to identify, formulate, and solve engineering problems.	✓
<b>f.</b>	An understanding of professional and ethical responsibility.	
<b>g.</b>	An ability to communicate effectively.	
<b>h.</b>	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal content	
<b>i.</b>	A recognition of the need for, and an ability to engage in life-long learning.	
<b>j.</b>	A knowledge of contemporary issues within and outside the electrical engineering profession.	
<b>k.</b>	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	✓