

SEMESTER	DEPARTMENT	COURSE TITLE
<i>Seventh</i>	<i>Power Engineering</i>	<i>Power Systems II Lab</i>
COURSE CODE	HOURS: 3	COURSE SPECIFICATIONS
<i>EP706</i>	UNITS: 1	<i>Practical Content</i>
<p>1. Investigate Resonance Characteristics in AC Circuits.</p> <ul style="list-style-type: none"> ➤ Investigate current and voltage changes with variation in capacity around Resonance in high Q series circuits. ➤ Repeat the investigation for parallel. ➤ Design build and test an Impulse Generator 		
<p>2. Measure Power and Power Factor in Single and 3-phase Circuits.</p> <ul style="list-style-type: none"> ➤ Using Voltmeters, ammeters, and a watt-meter verify the Power reading of the Watt-meter for various complex loads. ➤ Using the TWO watt-meter method verify the power consumed by a 3-phase balanced complex circuit. ➤ Using the TWO watt-meter method verify the power consumed by a 3-phase unbalanced complex circuit. 		
<p>3. Investigate Electrical Transients in DC & AC Circuits.</p> <ul style="list-style-type: none"> ➤ Investigate the charge and discharge of a Capacitor, resistor circuit using a dc and ac sources in switch mode. ➤ Investigate the charge and discharge of a Inductor , resistor circuit using a dc and ac sources in switch mode. ➤ Investigate the charge and discharge of a Inductor , Capacitor, resistor circuit using a dc and ac sources in switch mode. Use values where resonant properties are present. 		
<p>4. Investigate Properties of Different Type of Transmission Lines.</p> <ul style="list-style-type: none"> ➤ Investigate the Power losses in ‘Medium lines’ and their effects on voltage regulation. ➤ Investigate the Power losses in ‘Long lines’ and their effects on voltage regulation and Power capacity. 		

5. Determine Symmetrical Components of an un-balanced 3-phase Circuit.

Measure the:

- Positive Sequence voltage.
- Negative Sequence voltage.
- Zero Sequence voltage.
- Demonstrate the effect on phase of symmetrical components.

6. Determine Properties of Faults on Lines.

Investigate the following faults on three phase lines;

- Un balanced faults on the lines
- Single line – earth fault.
- Double line to earth fault
- Line to Line fault.

References:

1-*Elements of Power System*, by W. Stevenson.

2- *Power System Analysis*, John J. Grainger & William D. Stevenson JR. 1994.