

SEMESTER <i>Sixth</i>	DEPARTMENT <i>Power Engineering</i>	COURSE TITLE <i>Power Systems I Lab</i>
COURSE CODE <i>EP606</i>	HOURS: 3 UNITS: 1	COURSE SPECIFICATIONS <i>Practical Content</i>
<p>1. Experimental Verification of Network Theorems Using Simple Components and AC Voltage Sources.</p> <p>By connecting suitable components in a circuit powered by AC sources of the same frequency , the student should verify:</p> <ul style="list-style-type: none"> ➤ The Super Position Theorem. ➤ Thevenin and Norton Theorem. ➤ Reciprocity and Compensation. ➤ Maximum Power transfer theorem 		
<p>2. Identification of Four Terminal Network Parameters:</p> <ul style="list-style-type: none"> ➤ Using prepared circuit boards the student should measure the A, B, C, D parameters of the circuit and compare them with calculated values. ➤ Measure the Image Impedance ➤ Measure the Iterative Impedance ➤ And compare with calculated values. ➤ Repeat the exercises for more complex networks 		
<p>3. Power Transformer Parameters:</p> <ul style="list-style-type: none"> ➤ Measure voltage and currents in circuits using transformers of ratio not equal to unity and verify transformation rules of voltage, currents and impedance. ➤ Do the open and short circuit test on a transformer and determine it's parameters. 		
<p>4. Transmission Lines Properties:</p> <ul style="list-style-type: none"> ➤ Build and test simulated 'SHORT' and 'MEDIUM' length transmission lines of at least ten nodes. ➤ Measure the voltage distribution down the line. ➤ Repeat for a 'LONG' line using suitable capacitors and inductors. 		

5. Use of AC – Bridges in Determination of Inductance, Capacitance and Resistance:

Construct by choosing suitable values the

- Maxwell-Wien Bridge and determine the value of given components.
- Repeat using the Anderson Bridge.
- Repeat using the Hay's Bridge.
- Identify the special properties and use off the Schering Bridge and demonstrate it's use.
- Subject to component availability students should measure very low resistances using the Kelvin double Bridge.

References:

1. *Elements of power system*, by W. Stevenson.
2. *Power System Analysis*, John Grainger and William D. Stevenson JR. 1994