

SEMESTER <i>Second</i>	DEPARTMENT <i>General Engineering</i>	COURSE TITLE <i>Electrical Circuits II</i>
COURSE CODE <i>EP207</i>	HOURS: 3 UNITS: 3	COURSE SPECIFICATIONS <i>Theoretical Contents</i>
1. AC Circuits: <ul style="list-style-type: none"> ➤ Sin wave; Peak value, Average value, Effective value (RMS value) of current and voltage. ➤ In phase and out of phase waves, addition of two waves, vectorial representation, rotating vectors. 		
2. Analysis of Electric Circuits in Case of Periodic Signals ($j\omega$) and Defining the Impedance and the Admittance: <ul style="list-style-type: none"> ➤ Revision on complex numbers. ➤ Explain how to replace the source by a phasor. ➤ Illustration of phasor relationships for R, L, and C. ➤ Explain of equivalent impedance and equivalent admittance. 		
3. Use the several analysis techniques in frequency domain such as (Thevenin's and Norton's equivalent, Superposition, Nodal analysis, Mesh analysis) for circuits containing RLC.		
4. To Illustrate the Electric Power in Single Phase Circuits and to Show the Method Utilized in Correcting the Power Factor. <ul style="list-style-type: none"> ➤ Power in sinusoidal steady state. ➤ Average power. ➤ Apparent active power. ➤ Reactive power. ➤ Power triangular. ➤ Complex power. ➤ Power factor correcting. 		

5. To Know the Resonance Circuits and Their Specification.

- Study the series resonance, parallel resonance, and quality factor.

6. Introduction to 3 – Phase, Balance Circuits, Voltage, Current and Power Measurement.

- Voltage of 3 – phase systems.
- 3 – phase balanced system.
- Circuit of equivalent single branch for balanced systems.
- Connection of balanced systems on Δ and Y forms.
- Analysis the currents, voltages and power of 3 – phase balanced circuits.
- 3 – phase unbalanced system.
- 3-phase 4-wire system with neutral impedance.

7. Circuit Analysis of Circuits Containing Coupled Inductors and Transformers.

- Magnetic coupling.
- Coefficient of coupling.
- Conductively coupled equivalent circuit.
- Transformer.

Reference :

1. *Engineering Circuit Analysis*, William H. Hayt.
2. *Elements of Electrical Networks*; Dr. P. Narayana Reddy; Khanna Publishers Delhi