

College of Electrical & Mechanical Engineering (CEME-NUST)
Department of Electrical Engineering

Subject: EE-211, **Electric Network Analysis**

Prerequisite:

EE-111 Linear Circuit Analysis

Credit Hours: 3-1

Text Book: 1. **Electric Circuits Fundamentals**, 1st Edition, by Sergio Franco, Oxford English Press 1995.

Reference Books: 2. **Fundamentals of Electric Circuits**, 3rd Edition, by Charles K. Alexander & Matthew N.O.Sadiku, McGraw Hill 2003.

Course Objectives:

1. completes the circuit sequence of course material begun in EE 111 Linear Circuit Analysis.
2. The student should have a good grasp of AC circuit analysis techniques following completion of this course.
3. Students will be able to apply concepts in algebra, complex numbers, simultaneous equation and phasors to calculate accurate solutions to AC circuits.

Course Outcomes:

After completion of this course:

1. Students should be able to accurately determine transient & step response for 2nd order circuits.
2. Students should be able to accurately determine AC response of 1st & 2nd order circuits and hence are able to design lowpass, highpass, bandpass and band-reject filters.
3. Students should be able to accurately represent Impedance Model and its calculations using Linear Circuit Analysis.
4. Students should be able to apply the transfer function concept, to find the frequency behavior of an electrical system.
5. Students should be able to apply frequency domain methods of circuit analysis including the Laplace transform.

Topics Weeks

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| 1. Transient response of second order circuits | (3 Weeks) |
| 2. AC response of first and second order circuits | (1 Week) |
| 3. Mutual inductance & magnetically coupled coils, Ideal transformer | (1 Week) |
| 4. AC circuit analysis, Phasor algebra, AC impedance, Frequency domain analysis | (1 Week) |
| 5. AC steady state power, Concepts of average power. Complex power and power factor | (2 Weeks) |
| 6. Three Phase Systems and Power calculations. | (1 Week) |
| 7. AC resonance in series and parallel circuits | (1 Week) |
| 8. Network function in s-domain | (1 Week) |
| 9. Natural, Complete and Frequency response using H(s) | (1 Week) |
| 10. Laplace transforms and its application to solving differential equations of circuits | (3 Weeks) |

Evaluation Methods:	Quizzes/Assignments Tests	10%
	Two Sessional Exams	30%
	Lab:	20%
	Final Exam	40%

Professional Component: Analysis of AC circuits in time and frequency domain (Engineering Topics)

Prepared by: Lecturer Kamran Aziz Bhatti

Revised on: 13th February, 2012