

EEE 302 ELECTRICAL NETWORKS II

Instructor: Dr. Keith E. Holbert E-mail: Holbert@asu.edu
Office Hours: MTWTh, 10:30-11:30 a.m. in ERC 555 Phone: 965-8594
Meeting Info: MTWTh, 8:00-9:15 a.m. in ECG 319
Final Exam: Thursday, July 19, 2001 from 8:00-9:15 a.m.
Semester Exams: June 18 and July 5

Text: J.D. Irwin and C.-H. Wu, Basic Engineering Circuit Analysis, 6th Ed., 1999.

Other References: <http://www.eas.asu.edu/~holbert/eee302/eee302.html>
PSpice for Windows book from various authors

Course Objectives:

- Students can use AC steady state analysis on linear circuits.
- Students can use Laplace transforms to analyze linear circuits.
- Students can use important concepts from linear systems theory to characterize linear circuits.
- Students can design active linear circuits to implement a desired transfer function.

Course Description: Analysis of linear and nonlinear networks. Analytical and numerical methods. Prerequisite ECE 301. Pre- or corequisite: MAT 362.

Topics: Book Chapters: 8-14

8. AC Steady-State Analysis
9. Steady-State Power Analysis
10. Polyphase Circuits
11. Magnetically Coupled Networks
12. Variable Frequency Network Performance
13. The Laplace Transform
14. Application of the Laplace Transform

Homework

The homework assignments will be posted on the class web page. Homework is expected to be turned in on-time, which is defined as before the start of class on the due day. Presentation and methods for arriving at the answer are just as important as the mathematical answer; solutions should be neat and logical. For complete credit: (1) show all work, and (2) box the answer and include the units. Verification of hand solutions using PSpice (and vice versa) is encouraged (and is helpful when the answer in the book is incorrect). PSpice solutions must include (a) the circuit diagram, (b) the netlist, and (c) the output text and plots. Students may work together on the homework, but copying is unacceptable: the ASU *Academic Integrity Policy* (AIP) is incorporated herein by reference.

Grading

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| Homework | 15% |
| Pop Quizzes | 10% |
| Semester Exams (2) | 50% |
| Final Exam | 25% |

EEE 302 SEMESTER TEACHING PLAN
(Summer 2001)

| <u>Week</u> | <u>Date</u> | <u>Subject/Topic</u> | <u>Homework Due</u> |
|-------------|------------------------------|--|----------------------------------|
| 1 | 5/28 5/29 5/30 5/31 | ### Memorial Day ### Phasors (8.3); Phasor Relationships (8.4); Impedance & Admittance (8.5) Kirchhoff's Laws (8.7); AC Analysis: Nodal & Loop (8.8) AC Analysis: Superposition, Source Transform, and Thevenin (8.8) | |
| 2 | 6/ 4 6/ 5 6/ 6 6/ 7 | AC Analysis: Norton (8.8); PSpice Analysis (8.9) Instantaneous Power (9.1); Average Power (9.2) Max Avg Power Xfer (9.3); Effective or rms Values (9.4) Power Factor (9.5); Complex Power (9.6) | [Hmwk #1 Due] [Hmwk #2 Due] |
| 3 | 6/11 6/12 6/13 6/14 | Single-Phase Three-Wire (9.9); Safety (9.10) Three-Phase Circuits (10.1); Three-Phase Connections (10.2) Source/Load Connections (10.3); Power Relationships (10.4) Work Hmwk; Review for Exam | [Hmwk #3 Due] [Hmwk #4 Due] |
| 4 | 6/18 6/19 6/20 6/21 | *** Exam #1 (Chaps 8, 9 and 10) *** Mutual Inductance (11.1); Energy Analysis (11.2) Ideal Transformer (11.3); PSpice transformers Laplace Transform (13.1); Singularity Functions (13.2); Transform Pairs (13.3) | [Hmwk #5 Due] |
| 5 | 6/25 6/26 6/27 6/28 | Transform Properties (13.4); Inverse Transform (13.5) Convolution Integral (13.6); IV & FV Theorems (13.7) Laplace Circuit Solutions (14.1); Circuit Element Models (14.2) Analysis Techniques (14.3) | [Hmwk #6 Due] [Hmwk #7 Due] |
| 6 | 7/ 2 7/ 3 7/ 4 7/ 5 | cont (14.3); Transfer Function (14.4) Work Hmwk; Review for Exam ## Fourth of July Holiday ## *** Exam #2 (Chaps 11, 13 and 14) *** | [Hmwk #8 Due] |
| 7 | 7/ 9 7/10 7/11 7/12 | Variable-Frequency Response Analysis (12.1) Sinusoidal Frequency Analysis [Bode Plots] (12.2) cont (12.2) Resonant Circuits (12.3); Scaling (12.4) | [Hmwk #9 Due] |
| 8 | 7/16 7/17 7/18 7/19 | Filter Networks: Passive (12.5) Filter Networks: Active (12.5) Work Hmwk; Review for Final Exam *** Final Exam (Chap 12 and more) *** | [Hmwk #10 Due] [Hmwk #11 Due] |