Electrical Engineering 2CJ4
Circuits and Systems

Course Outline: Winter 2008

Objective:
At the end of this course, students will be able to solve electric circuits involving both passive and active elements for voltages at nodes, and branch or loop currents. They will be able to solve linear transient circuit problems involving second order systems using either classical or Laplace transform techniques, and will be able to analyze and sketch the frequency response of a circuit. In addition, students will have developed efficient tools for analyzing two-port networks and three-phase circuits, and will have been introduced to magnetic circuits.

Instructor:

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  All emails should contain the sequence "EE2CJ4" in the subject line

Schedule:
Lectures

- Monday, 9:30, T28/001
- Tuesday, 10:30, T28/001
- Thursday, 9:30, T28/001

Tutorials

- Section T05: Tuesday, 9:30-11:20, T13/105
- Section T06: Wednesday, 14:30-16:20, ABB/163
- Section T07: Tuesday, 12:30-14:20, BSB/B155
- Section T08: Thursday, 14:30-10620, T13/123

Outline:

- Review of circuit basics: Dissipative sign convention; Ohm's law; Kirchhoff's laws; Thevenin and Norton equivalents (Dorf: Chs 1-3,5,7,10; Irwin: Chs 2, 5; Rizzoni: Chs 2,3)
- Thevenin and Norton equivalents of circuits with dependent sources (Dorf: Ch 5; Irwin: Ch 5)
- Review of Node and mesh analysis of resistive circuits (Dorf: Ch 4; Irwin Ch 3; Rizzoni: Sects 3.2,3.3)
- Node and mesh analysis of resistive circuits with dependent sources (Dorf: Ch 4; Irwin Ch 3)
- Operational Amplifiers: Ideal and non-ideal models (Dorf: Ch 6; Irwin: Ch 4)
- Review of time domain analysis of linear second-order circuits (Dorf: Chs 8,9; Irwin: Ch 7; Rizzoni: Ch 5)
- Advanced steady-state analysis of linear circuits for sinusoidal signals and frequency response (Dorf: Ch 10, 13; Irwin: Chs 8, 12)
- Laplace Transform analysis of linear circuits (Dorf: Ch 14; Irwin: Chs 13,14)
- Two-port networks (Dorf: Ch 17; Irwin: Ch 16)
- AC steady-state power (Dorf: Ch 11; Irwin: Ch 9)
- Three phase circuits (Dorf: Ch 12; Irwin: Ch 11)
- Magnetic circuits (Lecture notes; Dorf: Ch 11; Irwin: Ch 10; Rizzoni: Chs 16,17)

Assessment:

- Tutorial participation: 3% (best 7 out of 10)
- Mid-term tests (2 @ 17.5%): 35%
- Final examination: 62%

Percentages will be converted to letter grades using the Registrar's recommended procedure.
Statistical adjustments (such as "bell curving") will not normally be used.

Policy on requests for remarking of mid-term tests:
A request for remarking of a mid-term test can me made using the form provided on the course web site. Mid-term tests written in pencil will not be remarked. Neither will test booklets with missing pages.

Policy on deferred tests and examinations:
When a test or examination is formally deferred (by providing the required documentation to the Associate Dean's office and obtaining written authorization), Dr Jeremic reserves the right to conduct that test or examination orally.

Calculator
Use of the McMaster Standard Calculator (Casio fx991) is allowed, but no other calculators will be allowed.

Resources:

- Textbook:
  - Dorf and Svoboda, *Introduction to Electric Circuits*, seventh edition, Wiley, 2006.
- Recommended Reading:
  - Irwin and Nelms, *Basic Engineering Circuit Analysis*, eighth edition, Wiley, 2004. (Your text from EE2CI5.)
  - Rizzoni, *Principles and Applications of Electrical Engineering*, fourth edition, McGraw-Hall, 2003.
- Slides from lectures: Portions of the slides used in the lectures will be available from the course web site: http://www.ece.mcmaster.ca/~jeremic/EE2CJ4. However, this material will be incomplete and will be difficult to use if you choose not to attend the lectures.

Policy Reminder:
Senate and the Faculty of Engineering require all course outlines to include the following reminders:

The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem, that cannot be resolved by discussion among the persons concerned, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.

Students are reminded that they should read and comply with the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available in the Senate Office.

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at http://www.mcmaster.ca/senate/academic/ac_integrity.htm.

The following illustrates only three forms of academic dishonesty:

- Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- Improper collaboration in group work.
- Copying or using unauthorized aids in tests and examinations.