

**ECE300**

**Electrical Circuits**

**Autumn 2008**

**Catalog Description:** Introduction to circuit analysis; circuit analysis concepts and their extension to mechanical and thermal systems by analogy; electrical instruments and measurements.

**Textbook:** *Principles and Applications of Electrical Engineering* by G. Rizzoni, 5<sup>th</sup>. ed., McGraw-Hill

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**Class Open Web page:** <http://www.ece.osu.edu/~bibyk/ece300.htm>

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**Course Objectives:**

1. Students learn the basic laws of circuit theory.
2. Students learn to analyze simple resistive or DC circuits.
3. Students learn to analyze simple sinusoidal RLC circuits.
4. Students learn about frequency domain concepts and filters.
5. Students learn to analyze simple operational amplifier circuits.
6. Students learn to analyze simple switching or transient circuits.

**Grading:** Homework(10%), Quizzes(20%), Midterm(33%), Final(37%)

Final Exam: Mon. Dec. 8, 2008, from 7:30 to 9:20pm

**Policies & Tips:**

1. Homeworks will be graded on effort and only samples graded. No late homeworks, no homework grade adjustments. Homeworks are to prepare for the quizzes and tests. Homeworks and quizzes need to be turned in your assigned section **in class**. Request for variances on this policy, even if allowed, may grade for only partial credit. No reply to a variance request means it is not allowed.
2. There will be 5 quizzes. The lowest quiz grade will be dropped – no makeups. Quizzes and test must be taken in the enrolled section. Any disputes of quizzes or test must be brought up within 2 weeks of the return of the graded item.
3. Circuits and Electronics Design is an art, and thus has many confusing approaches. It is best learned by looking at different explanations, and by actually building and testing circuits. Spice simulations are an alternative to building and testing, and can be useful for learning.

## ECE300 Course Schedule for Aut 2008

| <b>Week</b> | <b>Subject</b>   | <b>Textbook Reading</b>              |
|-------------|--|--------------------------------------|
| 1.          | Course Overview, Book Overview, Web and CAD overview.  | Preface, Chp. 1                      |
| 2.          | Kirchoff's <b>current &amp; voltage laws</b> , Ohm's law, power Conventions, sources and measuring devices.  | 2.1-2.8                              |
| 3.          | <b>DC Resistive circuit analysis</b> – nodal, mesh, superposition, Thevenin, Norton, equivalent circuits, power transfer, nonlinear. <b>Quiz 1</b>   | 3.1-3.8                              |
| 4-5.        | <b>Sinusoidal RLC circuits.</b><br>Capacitors and Inductors, sinusoidal response, phasor analysis, AC Circuit Analysis Methods. <b>Quiz 2</b><br>Frequency Response, Fourier & Linear System Response. | 4.1-4.3, A.2<br>4.4, 4.5<br>6.1, 6.2 |
| 6.          | Review. <b>Midterm – Fri. Oct. 31</b>  |                                      |
| 7.          | <b>Filters</b> , Bode Plots. <b>Quiz 3</b>   | 6.3, 6.4                             |
| 8.          | <b>Transient Analysis</b> , DC Steady State, First Order Response<br>Second Order Response. <b>Quiz 4</b>  | 5.1-5.5                              |
| 9.          | Power in AC circuits, Complex Power, Home power.   | 7.1, 7.2, 7.5                        |
| 10-11.      | Ideal <b>Op Amps</b> , Active Filters, Course Review. <b>Quiz 5</b>  | 8.1-8.3                              |

**Final - Mon. Dec. 8, 7:30-9:20pm**

Calendar Weeks: 1 – 9/24    2 – 9/29    3 – 10/6    4 – 10/13    5 – 10/20    6 – 10/27

Monday starts

7 – 11/3    8 – 11/10    9 – 11/17    10 – 11/24 (T break)    11 – 12/1

Finals – 12/8

Quizzes will typically be on Wednesdays.