ENGI 240  -  Electrical Circuits
4 Credit Hours

Term: Spring 2007
Instructor: Ken Floyd
E-mail: kfloyd@csi.edu

Office Location: Shields 207B
Office Hours: 8 - 8:50 AM MWF
Office Phone: 732-6583

1. Course Description:
   Introduction to dc, transient and sinusoidal steady-state electric circuit analysis; transient analysis by Laplace Transform methods.

2. Corequisites:
   MATH 310 Ordinary Differential Equations; ENGI 240L Electrical Circuits Laboratory

3. Required Textbook and Supplies:
   A. Electric Circuits, 7th Ed. by Nilsson and Riedel
   B. Engineering Computation paper
   C. Calculator (scientific or graphing)

4. Course Objectives:
   Develop knowledge of electrical circuit components and configurations; develop problem-solving skills and insights related to electric circuit analysis.

5. Outcomes Assessment:
   A. Evaluation of students:
      i) The student will demonstrate their mastery of course objectives by completing daily assignments. Student performance will be measured by regular chapter exams and a comprehensive final exam.
      ii) The student will be evaluated on communication of solutions to lab assignments. Fully correct solutions will be correctly reasoned and neatly written in standard engineering format and correct English.
   B. Evaluation of Course: As part of departmental analysis of outcomes in this course and its place in the Mathematics Program, student completion of the pre-requisite, success in the current course, success in subsequent courses and student satisfaction will be reviewed by the instructor. A report containing this information will be submitted by department faculty to determine what, if any, changes can be made to improve the course content, focus, and/or instruction.

6. Policies and Procedures:
   A. Class attendance is important for your success. If you miss a class, you are still responsible for the material covered, as well as any new homework assignments given. If you miss six (6) hours of class time, you may be dropped from the class at my discretion.
B. **Homework** will be assigned at the conclusion of each class, to be turned in at the *beginning* of the following class. Late assignments will not be graded, but will be assigned a grade of 4/10 if complete. *It is expected that students will complete all homework assignments.* Also, students who do not turn in assignments may be counted absent.

C. **Exams:** There will probably be 6 chapter exams in addition to a *comprehensive* Final Exam. The "chapter exams" may cover one or two chapters, and will be proctored in the Testing Center. Missed exams cannot be made up, but you may substitute your score on the Final Exam for one chapter exam. *Any student caught cheating on an exam will receive a score of negative 1 (-1) for that exam, which cannot be changed for any reason.*

D. **Cell phones:** Please turn off all cell phones, pagers, beepers, video games, etc.

E. **Children:** No children will be allowed in the classroom

F. As a student, you are expected to maintain appropriate conduct during the class, treating fellow students with respect and demonstrating a cooperative attitude toward the instructor. Inappropriate behavior will not be tolerated. After one warning, further breaches of acceptable conduct may result in your being dropped from the course, and the matter will be referred to student services for college discipline. If there is a situation creating a problem for you in this class, please let me know so I can conference with any students who are involved. Information regarding student Behavior Policies can be found on pages 15 and 16 of the CSI catalog.

7. **Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Exams 1-6</td>
<td>100 points each</td>
<td>90% A</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200 points</td>
<td>80% B</td>
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<tr>
<td>Homework</td>
<td>100 points</td>
<td>70% C</td>
</tr>
<tr>
<td>Labs</td>
<td>100 points</td>
<td>60% D</td>
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8. **On-line Course Evaluation:**

Students are strongly encouraged to complete evaluations at the end of the course. Evaluations are very important to assist the teaching staff to continually improve the course. Evaluations are available online at: [http://evaluation.csi.edu](http://evaluation.csi.edu). Evaluations are open two weeks prior to the end of the course through the last day of the course. Evaluations are anonymous, and should only take a few minutes. Your honest feedback is greatly appreciated!

9. **Disabilities:**

Any student with a documented disability may be eligible for related accommodations. To determine eligibility and secure services, students should contact the coordinator of Disability Services at their first opportunity after registration for a class. Student Disability Services is located on the second floor of the Taylor Building on the Twin Falls Campus. 208.732.6260 (voice) or 208.734.9929 (TTY), or e-mail aflannery@csi.edu.
### Tentative Course Schedule and Topical Outline

**Jan**  
15 **M**  Idaho Human Rights Day Holiday  
17 **W**  1.1-1.5 Circuit concepts  
18 **R**  Lab 1 Electrical Measurements  
19 **F**  1.6 Energy concepts  
22 **M**  2.1-2.3 Circuit elements  
24 **W**  2.4 Kirchoff's laws  
25 **R**  No Lab  
26 **F**  2.5 Dependent sources  
29 **M**  3.1-3.2 Resistive circuits  
31 **W**  3.3-3.4 Voltage and current divider circuits  

**Feb**  
1 **R**  Lab 2 Voltage and current measurement  
2 **F**  3.3-3.4 Voltage and current divider circuits (cont)  
5 **M**  3.5 Measuring voltage and current  
7 **W**  3.6 Wheatstone Bridge circuit for measuring resistance  
8 **R**  Lab 3 Circuit simulation software  
9 **F**  3.7 Delta-Wye equivalent circuits  
12 **M**  4.1-4.4 Node voltage analysis  
14 **W**  4.1-4.4 Node voltage analysis (cont)  
15 **R**  Lab 4 Instruments  
16 **F**  4.5-4.8 Mesh current analysis  
19 **M**  -  
21 **W**  4.9 Source transformations  
22 **R**  No Lab  
23 **F**  4.10 Thevenin and Norton equivalent circuits  
26 **M**  4.11 More on Thevenin equivalent circuits  
28 **W**  4.13 Superposition  

**Mar**  
1 **R**  Lab 5 Thevenin and Norton equivalent circuits  
2 **F**  4.12 Maximum power transfer  
5 **M**  Review Chap 4 - Exam 2 open  
7 **W**  6.1 Inductance  
8 **R**  Lab 6 Superposition  
9 **F**  6.2 Capacitance  
12 **M**  6.3 LC circuits  
14 **W**  Review Chap 6 - Exam 3 open  
15 **R**  Lab 7 Maximum power transfer  
16 **F**  7.1 RL circuits: Natural response  
26 **M**  7.2 RC circuits: Natural response  
28 **W**  7.3-7.4 Step response  
29 **R**  Lab 8 RC circuits  
30 **F**  7.5 Sequential switching  

**Apr**  
2 **M**  Review Chap 7 - Exam 4 open  
4 **W**  8.1 Parallel RCL circuits: Natural response  
5 **R**  Lab 9 Intro to Op Amps  
6 **F**  8.2 Parallel RCL: Damping  
9 **M**  8.3 Parallel RCL circuits: Step response  
11 **W**  8.4 Series RCL circuits: Natural and step response  
12 **R**  Lab 10 Op Amps  
13 **F**  Review Chap 8 - Exam 5 open
11. Tentative Course Schedule and Topical Outline (continued)

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Section(s)</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>M</td>
<td>9.1-9.2</td>
<td>Steady-state sinusoidal analysis</td>
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<tr>
<td>18</td>
<td>W</td>
<td>9.3-9.4</td>
<td>RLC phasors; Passive elements in the s (frequency) domain</td>
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<tr>
<td>19</td>
<td>R</td>
<td>Lab 11</td>
<td>Laplace Transforms</td>
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<tr>
<td>20</td>
<td>F</td>
<td>9.5-9.8</td>
<td>Node voltage with complex impedance</td>
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<td>23</td>
<td>M</td>
<td>9.9</td>
<td>Mesh-currents in the s domain</td>
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<tr>
<td>25</td>
<td>W</td>
<td>Review</td>
<td>Chap 9 - Exam 6 open</td>
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<td>R</td>
<td>Lab 12</td>
<td>Laplace Transforms (cont)</td>
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<td>27</td>
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<td>10.1</td>
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<td>30</td>
<td>M</td>
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<td>May 2</td>
<td>W</td>
<td>10.3</td>
<td>RMS power</td>
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<td>3</td>
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<td>4</td>
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<td>Review</td>
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<td>8</td>
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<td>Final Exam, 8 - 10 AM</td>
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