ECE 280 - CIRCUIT ANALYSIS

SUMMER 2009  ECE 280- Section 40609  Instructor: Dr. Alok K. Berry  Phone: (703) 993-1606
MW 4:30 P.M. - 8:10 P.M.  Room# 4457, The Engineering Building,  email: aberry@gmu.edu

Students are expected to check their email regularly. Short notice changes: homework due dates, exam info, class delay/cancellation etc. may be announced via email. For e-mails only the university assigned email address will be used.

1. Course Description: Circuit analysis using superposition, equivalent circuits, transient and steady state analysis of RL, RC and RLC circuits. Applications of Laplace transform in circuit analysis, sinusoidal excitations and phasors, resonance, filters, AC steady-state analysis, coupled coils, and three phase circuits. PSPICE as a circuit analysis tool will be used. A lab demonstrating and investigating circuit analysis concepts is included. Students are expected to be familiar with basic circuit analysis terms and concepts (current, voltage, resistance and Ohm’s Law) prior to entry into ECE 280 and are expected to have mastered the theory and manipulation of Laplace Transforms (via ECE 220) prior to the point in the class where they are applied (see Proposed Schedule).

   Publisher: Mc Graw Hill, Cost: New Book $186.75, Used Book $139.75

3. Office Hours: Room 3832, The Engineering Building  MTWR 3:30 p.m. - 4:15 p.m.  By Appointment
   The Engineering Building  TR  7:15 p.m. - 7:45 p.m.  By appointment only

4. Honor Code: All students are expected to abide by the George Mason University Honor Code. Sharing of ideas and comparison of answers on homework is acceptable, but copied work will not be accepted. In-class exams will be closed notes unless specifically stated by the instructor. All work must be your own. Any reasonable suspicion of an honor violation will be reported to the Honor Committee.

5. Grading: Three Class Exams (20% each)  60%
   Comp. Final Exam  20%
   Homework, Class participation and class attendance  5 %
   Labs  15%
No make up for missed exams. In extreme circumstances if a makeup exam is to be given, arrangements may be made during the comprehensive final exam day.

In an extreme case if a makeup exam is given only 50% of the credit (what one earns in the makeup exam) may be counted in making the final grade. The makeup exam may be an oral exam.

If you receive very low grades, less than 50%, in one or more class exams or in the comp final exam, you may receive a grade “F” in the course.

6. Homework Policies: Homework will be assigned in class and/or via email during the period a chapter is being covered. Only one problem will be graded in each homework. The homework will be turned in at the due date. Late homework will not be accepted unless prior arrangements have been made with the instructor. If a late HW is accepted only partial (50%) credit will be given. Homework solutions will be provided by email or a copy may be provided in the class.

7. Grade Changes: A student, requesting that the grade of a homework or exam problem be reconsidered, must provide the instructor with the following information in writing on the same day the work is returned to the class:
   a. The number of the problem(s) to be reconsidered;  b. A description of your mistakes made in the problem(s); and  c. The reason that you feel that you should receive additional points for the problem(s). i.e. material the instructor did not see that was on the exam or homework paper.

Note: The entire exam or homework may be reconsidered by the instructor at this time.
## PROPOSED SCHEDULE

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<tr>
<th>DATES</th>
<th>SUBJECT</th>
<th>LECTURE REFERENCE</th>
<th>INDEPENDENT READING</th>
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<tr>
<td>6/1</td>
<td>KVL, KCL, Ohm’s Law, Series/Parallel Resistors.</td>
<td>2.2, 2.4-2.6</td>
<td>Chap 1, B/In2*</td>
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<td>1.6, 2.7, 2.8</td>
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<td>6/3</td>
<td>Nodal and Mesh Analysis</td>
<td>3.2-3.7</td>
<td>B/In 3, 3.8 in Rct.</td>
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<td>6/8</td>
<td>Superposition, Thevenin’s/Norton’s Theorem.</td>
<td>4.2 - 4.6, 4.8</td>
<td>B/In4*, 4.7, 4.9</td>
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<td>6/10</td>
<td>Operational Amplifiers.</td>
<td>5.2 - 5.8</td>
<td>B/In5*</td>
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<td>6/15</td>
<td><strong>I EXAM</strong>, Capacitors and Inductors.</td>
<td>6.2 - 6.6</td>
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<td>6/17</td>
<td>First Order Circuits</td>
<td>7.2-7.6,</td>
<td>B/In7*, 7.8</td>
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<td>6/22</td>
<td>Second Order (2(^{\text{nd}}) O) Circuits.</td>
<td>8.2 - 8.7</td>
<td>B/In8*</td>
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<td>6/24</td>
<td>L. Transform and s-domain Circuit Applications</td>
<td>16.1 - 16.4</td>
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<td>6/29</td>
<td><strong>II EXAM</strong> Sinusoids and Phasors</td>
<td>9.4-9.7</td>
<td>B/In9*, 9.1-9.3</td>
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<td>7/1</td>
<td>AC Nodal/Mesh Analysis</td>
<td>10.2-10.3</td>
<td>B/In10*</td>
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<td>7/6</td>
<td>Sinusoidal Steady State</td>
<td>10.4 - 10.7</td>
<td>B/In10*</td>
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<td>Average Power, RMS.</td>
<td>11.2 - 11.4</td>
<td>B/In11*</td>
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<td>Mutual Inductance</td>
<td>13.2 - 13.4</td>
<td>B/In13*</td>
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<td>7/13</td>
<td>Mutual Inductance, Linear and Ideal Transformer</td>
<td>13.5 - 13.6</td>
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<td>7/15</td>
<td><strong>III Exam</strong>, Frequency Response</td>
<td>14.2, 14.5, 14.6</td>
<td>B/In14*</td>
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<td>7/20</td>
<td><strong>COMP FINAL EXAM</strong> - Chapters 2 - 11, 13 - 16.</td>
<td>All</td>
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*B/In = Biography/Introduction/Chapter Sections

I Exam: Chapters 2 - 5.
II Exam: Chapters 6 - 8, and 16. It may be a take home exam.
III Exam: Chapters 9-11, 13,14
Comprehensive Exam. Chapters 2 - 11, 13 - 16.

**Comprehensive Final Exam:** Monday, July 20, 4:30 p.m. - 6:30 p.m. Chapters 2 - 11, 13 - 16.

Please check the Summer 09 schedule. Note that June 17\(^{\text{st}}\) is the last date to drop and selective withdrawal period is 6/18 to 7/7/09.

Please note that lab is an integral part of the course. If you miss many lab sessions your grade will go down; you may even receive failing grade in the course.

It is important that you must attend all the classes as some graded work will be done during the class. You may receive failing grade if you miss more than 2 classes.
TEST TIPS

* Print your Name *VERY CAREFULLY* on First Sheet/Question sheet

* Read the Problem

* Answer what (but only what) is Asked

* Label diagrams with parameters in equations - Points are lost here!

* Watch for, and then include UNITS in answers - Points are lost here!

* Identify Answers (Box, Circle, Underline, etc) and put them at the designated space (if provided).

* Communicate

* You *have* seen all required concepts before

*In a plot you must you must express clearly what is represented on the axes, units and the scale if required. Points are lost here!

DON'T PANIC!!

In general:

Manage your time. (Also known as "racking up the points")

Skim all problems - find familiar areas.
Read total problem through: if part "a" is "impossible", parts "b", "c", etc may be "doable".
Allot more time to high point value problems.
Leave time to go back and touch up earlier problems.
Do easiest problems first.
Quit when you reach the end of a problem's budgeted time.
You will invariably get more points by starting a new problem than by trying to finish an old one.
Guess. (If the odds are with you)

Make clear how you are solving a problem. (Don't make me guess)

Tell me what you would do (if you had more time or if the problem had not gotten out of control by some errors).

Note any assumptions you have made in doing the problem.

Watch point values: generally they tell how much work is involved.
HOMEWORK DO’S AND DON’TS

A. Mechanics: Points will be deducted for not following these guidelines.

1. Buy, beg or steal a stapler to fasten homework pages together. Unstapled HWs will not be accepted.

2. Print your name carefully in UPPER CASE LETTERS and write last three digits of your student number.

3. Use only standard (8 ½ x 11) size paper.

4. Do not use legal size paper.

5. Computer paper is OK if cut to standard size.

6. Do not use spiral bound notebook paper.

7. Do not fold assignments in half.

8. Put all the problems in order.

9. On the first page/cover sheet must write the assigned homework problems and you must mention the problems which you have not attempted.

10. If the homework is not submitted in the class there are good chances for it to be lost.

11. Must draw all the required circuit diagrams. If required circuit diagrams are not drawn you may not get any credit for that problem.

12. In the beginning of the class, if needed, home work problems will be discussed.

13. SHOW ALL THE WORK NEATLY.

B. Other considerations

1. Show work. Techniques, approaches and methods for solving are more important than answers on homework (but answers DO count).

2. Attack problems yourself, but work with others to master the material if you get stuck. The work you turn in however, is to be your own, not a copy of someone else's efforts.

3. Include all diagrams, labels, etc necessary for the problem to stand "alone."

4. Identify (Box, circle, underline, etc) answers.

IMPORTANT: Please note it is the university policy that all sound emitting devices shall be turned off during classes unless otherwise authorized by the instructor.