ECE 280 - CIRCUIT ANALYSIS

Spring 2010        ECE 280- Section 001 13882  Instructor: Dr. Alok Berry
MW 10:30 P.M. - 12:20 PM, Room# R B102, email: aberry@gmu.edu Phone: (703) 993-1606
Office Room # 3238, The Engineering Building

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).


3. Office Hours: Room 3832, The Nguyen Engineering Bld. MW 1:30 p.m. - 2:30 p.m.
TR 1:00 p.m. –2:00 p.m.
Others by appointment

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:
   Two Class Exams (25% each) 50%
   Comp. Final Exam 25%
   Mini Exam (ME)* 5%
   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.

   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.

   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.

   * The Mini Exam (ME) will be given in the third week of classes. The material covered in this exam will be whatever has been covered in the first two weeks of classes and the circuit material covered in PHYS 260.

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 home work. The homework will be turned in at the due date. Late home work 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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<thead>
<tr>
<th>DATES</th>
<th>SUBJECT</th>
<th>LECTURE REFERENCE</th>
<th>INDEPENDENT READING</th>
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<tbody>
<tr>
<td>1/20, 1/25</td>
<td>KVL, KCL, Ohm’s Law, Series/Parallel Resistors</td>
<td>2.2, 2.4-2.6</td>
<td>Chap 1, B/In2* 1.6, 2.7, 2.8</td>
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<tr>
<td>1/27, 2/1</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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<tr>
<td>2/3</td>
<td><strong>Mini Exam (about 20 minutes duration)</strong></td>
<td>4.2 - 4.6, 4.8</td>
<td>B/In4*, 4.7, 4.9</td>
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<td>2/3, 2/8</td>
<td>Superposition, Thevenin’s/Norton’s Theorem.</td>
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<tr>
<td>2/10, 2/15</td>
<td>Operational Amplifiers.</td>
<td>5.2 - 5.8</td>
<td>B/In5*</td>
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<tr>
<td>2/17, 2/22</td>
<td>Capacitors and Inductors.</td>
<td>6.2 - 6.6</td>
<td>B/In6*</td>
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<tr>
<td>2/24, 3/1</td>
<td>First Order Circuits, Second Order Circuits</td>
<td>7.2-7.6, 8.2</td>
<td>B/In7*, 7.8</td>
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<td>3/3</td>
<td><strong>Ist Exam</strong></td>
<td>Chapters 1 - 7</td>
<td></td>
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<tr>
<td>3/15, 3/17</td>
<td>Second Order (2nd O) Circuits.</td>
<td>8.2 - 8.7</td>
<td>B/In8*</td>
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<tr>
<td>3/22, 3/24</td>
<td>L. Transform and s-domain Circuit Applications</td>
<td>16.1 - 16.4</td>
<td>Ch. 15</td>
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<td>Nodal/Mesh Analysis</td>
<td>10.2-10.3</td>
<td>B/In10*</td>
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<td>4/5, 4/7</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>4/12, 4/14</td>
<td>Mutual Inductance, Linear Transformer</td>
<td>13.2 - 13.4</td>
<td>B/In13*</td>
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<td>4/19</td>
<td><strong>2nd Exam</strong></td>
<td>Chapters 8-11, 16</td>
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<td>4/21, 4/26</td>
<td>Linear and Ideal Transformer</td>
<td>13.5 - 13.6</td>
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<tr>
<td>4/28, 5/3</td>
<td>Review, Frequency Response</td>
<td>14.2, 14.5, 14.6</td>
<td>B/In14*</td>
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*B/In = Biography/Introduction/Chapter Sections

I Exam: Chapters 1 - 7.
II Exam: Chapters 8 - 11, and 16.
Comprehensive Exam. Chapters 2 - 11, 13 - 16.

**Comprehensive Final Exam: Wednesday, May 5th, 10:30 a.m. - 1:15 p.m. Chapters 2 - 11, 13 - 16.**

Please check the exam schedule.

Please note that Friday, February 19th is the last date to drop and selective withdrawal period is from 2/22 to 3/26.

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 required that you must attend all the Recitation classes as some graded work will be done in these 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 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, homework problems will be discussed.

13. SHOW ALL THE WORK NEATLY.

14. Do the HOME WORK very neatly and keep it organized. In the exams one of the problems may be collected out of the HW problems.

15. Home Work will be accepted in class only. If you drop the home work in my office by sliding it under the door, the home work will not be graded and no credit will be given. You will be losing your HW.

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. It is required by me that all of these devices will be kept in the purse or in the back-pack. If you have an emergency and want to keep the cell phone out you must talk with me prior to the class.

SOME IMPORTANT INFORMATION

ACADEMIC INTEGRITY

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else’s work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

GMU EMAIL ACCOUNTS

Students must activate their GMU email accounts to receive important University information, including messages related to this class.

OFFICE OF DISABILITY SERVICES

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu

OTHER USEFUL CAMPUS RESOURCES:

WRITING CENTER: A114 Robinson Hall; (703) 993-1200; http://writingcenter.gmu.edu

UNIVERSITY LIBRARIES “Ask a Librarian”
http://library.gmu.edu/mudge/IM/IMRef.html

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380; http://caps.gmu.edu

UNIVERSITY POLICIES

The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university affairs.

In case of emergency the important number to call is 703-993-2810