ECE 285 - ELECTRIC CIRCUIT ANALYSIS

Spring 2017    Electric Circuit Analysis - 12756 - ECE 285 – 001
MW 9:00 AM - 10:15 AM,    David King Hall 1006,    Instructor:    Dr. Alok Berry
Office Room # 3238, Nguyen Engineering Building    email:    aberry@gmu.edu    Phone: (703) 993-1606
Office Hours:    MW 10:30 – 12:00 PM,    TR 10:00 – 11:00 AM by appointment only,    others by appointment
Teaching Assistants: Ashkan Vakil    email:    avakil@masonlive.gmu.edu    Teaching Labs
Sai Divya Kandalam    email:    skandal2@masonlive.gmu.edu    Teaching Labs
Jongbong Nah    email:    jnah@gmu.edu    ECE 285 Recitation and Grading
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. Note that only the university assigned email address will be used.

1. Covers the first half of electric circuit theory and practice. Topics include DC analysis of circuits including Ohm’s and Kirchhoff’s laws, Thevenin and Norton equivalents, and analysis of circuits with resistors, capacitors, inductors, and operational amplifiers. Lab experiments are included to reinforce topics covered in the course.

Prerequisite(s): PHYS 260 and 261.    Corequisite(s): MATH 214.

Publisher: McGraw Hill

3. 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.

4. Grading: Class Exams (Two or Three)    45%
Comprehensive Final Exam    10%
Homework    10%
Mini Quizzes in Recitation and Class Work    10%
Project    5%
Lab Experiments    20%
No make up for missed exams. In extreme circumstances if a makeup exam is to be given, it will be given at a mutually agreeable date/time or during the comprehensive final exam day.

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.
In mini quizzes if you consistently receive low scores (less than 60%) and less than 60% overall, you may receive a failing grade “F” in the course.
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 failing grade “F” in the course.
Attendance in the recitation is important. Most of the Mini Quizzes will be given in the recitation classes. Missing more than two recitation classes may result in a failing grade in the course.

5. Homework Policies: Homework will be assigned in class and/or via email during the period a chapter is being covered. 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. Some homework solutions will be provided by email or a copy may be provided in the class. Home Works will be accepted in class only and after grading returned in class. If you happen to miss the class when HW is returned then it is your responsibility to collect it from my office.

6. 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.
### ECE 285: Electric Circuit Analysis I  
**Spring 2017: Tentative Lecture – HW/Exam Schedule**

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<tr>
<th>No.</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>Independent Reading</th>
<th>HW Due</th>
<th>Lab. #</th>
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<tr>
<td>M 1/16</td>
<td>Martin Luther King Day, No Classes</td>
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<tr>
<td>1</td>
<td>M 1/23</td>
<td>Course Introduction - Review</td>
<td>Chapters 1-2</td>
<td>Ch.1, I* Ch.2</td>
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<td>Introduction</td>
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<td>2</td>
<td>W 1/25</td>
<td>Ohm’s Law, KVL and KCL</td>
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<td>3</td>
<td>M 1/30</td>
<td>KVL, KCL, Series Resistors</td>
<td>2.4 – 2.5</td>
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<td>4</td>
<td>W 2/1</td>
<td>Series and parallel Resistors</td>
<td>2.5 – 2.6</td>
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<td>M 2/6</td>
<td>Nodal Analysis</td>
<td>3.1 – 3.3</td>
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<tr>
<td>6</td>
<td>W 2/8</td>
<td>Mesh Analysis</td>
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<td>7</td>
<td>M 2/13</td>
<td>Nodal, Mesh Analysis Problems</td>
<td>3.2 – 3.7</td>
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<td>Practice/Project Lab</td>
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<td>8</td>
<td>W 2/15</td>
<td>Superposition, S. Transformation</td>
<td>4.1 – 4.3</td>
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<td>M 2/20</td>
<td>Source transformation</td>
<td>4.3 -4.4</td>
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<td>10</td>
<td>W 2/22</td>
<td>Thevenin and Norton’s Theorem</td>
<td>4.5 – 4.6</td>
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<td>Lab 4</td>
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<td>M 2/27</td>
<td>Solving Problems</td>
<td>4.5 – 4.8</td>
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<td>M. Tr. of Power, Review for Exam</td>
<td>4.8</td>
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<td>Chpts. 1 – 4</td>
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<td>14</td>
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<td>Operational Amplifier</td>
<td>5.1 – 5.3</td>
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<td>W 3/29</td>
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<td>Step Responses RC and RL Circuits</td>
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<td>25</td>
<td>M 4/19</td>
<td>Source Free RLC Circuits</td>
<td>8.3 – 8.4</td>
<td>Notes</td>
<td>Practice/Project Lab</td>
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<td>M 4/24</td>
<td>RLC Circuit Problems</td>
<td>8.3 – 8.4</td>
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<td>27</td>
<td>W 4/26</td>
<td>Step Response RLC Circuits</td>
<td>8.5 – 8.7</td>
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<td>Lab 9</td>
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<td>30</td>
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<td>Final Exam</td>
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<td>Final Exam</td>
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*I* is for Introduction of the Chapter. HW due dates are tentative.

**Lab Classes:** Monday: 4:30 – 6:20 p.m.  Tuesday: 1:30 – 3:20 p.m.  Tuesday: 6:00 – 7:50 p.m.  
and Thursday: 6:00 – 7:50 p.m.  All in ENGR 3203 Check class schedule

**Recitation Classes:** Friday: 1:30 – 2:20 p.m. in KH 253, Friday: 2:30 – 3:20 p.m. in KH 253 and  
Tuesday: 3:30 – 4:20 p.m. in KH 253

**Cumulative Final Exam:**  
Check exam schedule. The comprehensive final exam will be about 1.25 hours long and it will be mostly MULTIPLE CHOICE PROBLEMS.
LABORATORY:
The laboratory experiments are an essential part of this course, as they will provide you with the opportunity to explore your understanding of the concepts developed in class through the construction and analysis of a variety of AC circuits. You will compare the results of your experiments with the expected results determined through calculations to better understand the behavior of real circuits as compared to ideal circuits. There will be several laboratory experiments conducted over the course of the semester. For each lab, you are expected to read the associated sections of the textbook and complete the pre-lab. You will not be allowed to perform the lab if you are not properly prepared. Following the completion of each laboratory experiment, you will be expected to write a lab report. The lab report is due one week after the experiment is completed.

Attendance in the labs is mandatory. Failure to attend labs will result in a zero credit for the lab and you may get failing grade in the course.

Learning Outcomes:
Upon successful completion of Electric Circuit Analysis I, students will be able to (1) solve any circuits containing resistors, capacitors, operational amplifiers, and inductors; (2) describe the implications of short circuits and open circuits; (3) have practical experience in basic debugging techniques; (4) explain in lay terms what a circuit does and how it accomplishes an objective; (5) design a circuit to meet specific criteria (for example, power consumption or current levels, voltage levels); (6) use at least two methods to solve any one circuit; (7) describe circuit theorems that are critical in circuit design and circuit analysis

TEST TIPS
* Print your Name VERY CAREFULLY on First Sheet/Question sheet; you will lose points if you don’t do it.
* 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!
* In class/exams calculators are allowed. Graphing calculators are not allowed.

In general:
Manage your time. (Also known as "racking up the points")
- Skim all problems - find familiar areas. Do easiest problems first.
- 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.
- 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. Use only standard (8 ½ x 11) size paper. Do not use spiral bound notebook paper. Do not fold assignments in half.

3. On the first page/cover sheet print your name carefully in UPPER CASE LETTERS and write last three digits of your student number. Write the assigned homework problems and must mention the problems which you have not attempted. Put all the problems in order.

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

5. Email me a day before if you want some HW problems to be discussed in class next day.

6. SHOW ALL THE WORK NEATLY.

7. 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.

8. 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.

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

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 keep the cell phone out or you take it out; you may be asked to leave the class and you must see me before the next class, to discuss this matter. If you have an emergency and want to keep the cell phone out you must talk with me prior to the class. Texting, using your laptop for something other than lecture-related work is considered a distraction to me and to the other students trying to learn in the class, and will not be tolerated.
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 use their Mason email accounts - either the existing “MEMO” system or a new “MASONLIVE” account to receive important university information, including messages related to the class. See http://masonlive.gmu.edu for more information

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 academic affairs. Other policies are available at http://universitypolicy.gmu.edu/.

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

Information to help students – Volgenau School

In an effort to relieve student frustration, we have prepared some documentation for use with your classes and to be inserted in your syllabi. One document, “Student Welcome” is a brief introduction to some of the services our department offers to our students and might help the students find answers to their questions more rapidly. You can find the latest version of this document at:

http://labs.vse.gmu.edu/uploads/FacultyFAQ/StudentWelcome.pdf