Course Information

ECE 211 Fall 2015
Circuit Analysis I

Goals and Objectives

The objective of this course is to introduce you to the methodology of electrical and computer engineering and lay a foundation for future work in the field through the study of electrical circuits. In particular, at the conclusion of this course, you will:

- understand the methodology of modeling real-life systems by lumped circuit models;

- be able to analyze DC resistive circuits using network theorems such as superposition, Thevenin's Theorem, and Norton's Theorem;

- be able to analyze RC, RL, and RLC circuits through the use of differential equations;

- be able to analyze basic RC, RL, and RLC circuits through the use of Laplace transform techniques; and

- be able to use modern software tools, particularly PSpice, for the analysis and simulation of electric circuits.

Instructional Approach

The term you will likely hear most often is "mastery". Course credit is earned entirely and exclusively through mastery of 16 online modules and 20 computer exercises covering all the topics of the course. There are still lectures and recitations, but there are no weekly homework assignments or quizzes and no midterm or final exams. Since the modules are administered online, you may retake them. This means that if you do not master a module, it does not count against you, but if you do master a module, it counts toward your semester grade. The questions and contexts will change with every attempt, but the central concepts and techniques do not change. Thus, if you have truly mastered the material, you can be given any circuit, be asked any question, and you will be able to answer it correctly.

It is strongly recommended that you attend all discussions and interactive sessions. These will help you learn the concepts and techniques needed to demonstrate mastery in the online modules and computer exercises.

Course Format

Lecture: Recorded, available on OWL, under Video Links

Discussion: Two 75-minute sessions per week (Tu, Th, 8:30–9:45am, Goessmann Lab, room 20)

Interactive session: One 75-minute class per week (Tu, 2:30–3:45pm, Goessmann Lab, room 20)

Mastery Modules: Sixteen online tests, administered by OWL

Computer Exercises: Five Excel problems, five MATLAB projects, and ten PSpice simulations, all of which will be made available under Exercises and done by each student outside the classroom on the computer

Instructor

Bill Leonard
Marcus 8B
545-3513
leonard@ecs.umass.edu
Office Hours: any time I am in my office
Responsibilities: Overall class organization and administration, discussions, OWL, Moodle, interactive sessions

Grader

[to be determined]
[]
[]

Office Hours: []
Responsibilities: Grading computer exercises

Tutors

Prerequisites and Corequisites

In order to take this course, you must have earned a C or better in Math 132 (Integral Calculus) and Physics 151 (calculus-based Physics I, with lab).

Math 331 (Differential Equations) is a co-requisite.

A status of EE or CSE standing is required. If you have not qualified for EE or CSE yet (e.g., you are still an ENGIN major), talk to Prof. Leonard.

Textbooks (available through Amazon)

Required

PSpice for Linear Circuits, Second Edition (with CD-ROM), by J.A. Svoboda, Wiley, 2007. (ISBN 978-0-471781-46-2)

Recommended

Engineering Circuit Analysis, by Hayt, Kemmerly, and Durbin, McGraw-Hill, 2012. (ISBN 978-0-07-352957-8)

You may substitute the 6th or 7th edition of Hayt, Kemmerly, and Durbin, if you prefer.

Other materials (also available through Amazon)

Required

SHARP EL-531X calculator

i>clicker 2 Remote (ISBN 978-1-49-860163-4)

You may substitute the SHARP EL-531W, if you prefer. Graphing calculators are not allowed. To find out if a different calculator might be substituted, contact Prof. Leonard.

Course Components

There is no weekly homework in this course and no weekly quizzes. There are no semester exams, and there will not be a final exam. Instead, your grade will be determined by your best score in each of the online modules. Computer assignments will potentially adjust your semester grade as described below. Thus, there are only two required components in this course: Computer exercises and Mastery modules. We will be using a mastery approach for both.

Computer exercises. During this semester, you will learn the rudiments of Excel, MATLAB, and PSpice. For Excel and MATLAB, there are 10 problems, 5 each in Excel and MATLAB. For PSpice, there are 10 simulations.

Each is worth 10 points. If you submit a perfect solution, you will earn 2 "Mastery" points. If this is submitted before a certain "Bonus" date, you will earn an additional 2 points. See the Mastery Calendar on Moodle for specific dates.

Descriptions will be available in Assignments.

Due dates are almost every week of the semester starting near the end of September.

Each computer exercise can be resubmitted without penalty at any time before the last day of classes.

Mastery modules. There are a total of 16 online modules, administered by OWL. Twelve are "Basic" modules, covering definitions and basic techniques. Three are "Intermediate" modules, which integrate topics within a set of Basic modules and encourage efficient decision-making. There is one "Cumulative" module, covering the entire course.

Each module has 10 questions. To earn mastery, you must answer all 10 questions correctly in a designated secure setting.

If you earn a perfect score on a module, you earn "Mastery" points, up to 6 per module. Thus, a 9/10 is worth 9 points toward your total score, but 10/10 is worth 12, 14, or 16 points, depending on the assignment you master.

There will be 12 attempts available for each required module. You only need to master **one** of the attempts. If you fail to master any particular attempt, it does not count against you. You simply make another attempt at that module.

Only the best score on each module (including Mastery points) counts toward your semester

total.

For more information, go to the Modules page.

Grading

Your grade is determined by the total number of points you have accumulated. We start with your best score on each module. We add "Mastery" points if you have earned a perfect score, as many as 6 points per module, and then add up all these scores. Next, we add your points from the computer exercises. Finally, we add Bonus points, which can be earned, e.g., by filling out a survey.

To earn a C, you must earn at least 350 points, of which:

1. 200 must be from computer exercises, including Mastery points, but not Bonus points; and

2. 150 must be from modules, also including Mastery points, but not Bonus points.

In addition, you must meet all of the following criteria:

3. You must earn at least 6/10 on every Basic module (B1 through B12);

4. You must earn at least 9/10 on both B6 (Thevenin) and I1 (Solving resistive networks);

5. You must earn at least 10/10 on either B1 or I1; and

6. You must earn 30 points (total) on modules B10 through B12, including Mastery points.

If you meet all of these criteria, you have a guaranteed grade of C. However, if you do not meet all six of these criteria, your highest guaranteed grade is C–. If you are close to meeting one or more criteria, talk to Prof. Leonard about your grade.

Once you have earned a C, you earn one grade increment (e.g., C to C+) for every 20 points you earn. Thus, for example, a total of 470 course points is an A.

For more detailed information about grading, go to the Grading page. If you are not sure exactly how you will be graded, please talk to Prof. Leonard.

Exams

There are **no** evening exams, and there is no final exam. Your grade is determined entirely by your score on computer assignments and the number and type of online modules you master.

Homework

There is **no** required homework in this course. However, associated with each Mastery module will be a Practice module, also administered by OWL. Although these are completely optional, they will serve the role of homework, as they help you to prepare to master the required modules. We recommend that you spend between one and two hours working on the Practice module associated with each Mastery module. Note that answering all the Practice questions correctly once does not necessarily mean you are ready to make a Mastery attempt. Use the "Redo Question" button often, so that you can see different contexts and check to make sure you have mastered the material.

Collaboration vs. Cheating

You are encouraged to work together on Practice modules and computer assignments; however, you must master required modules on your own, and you must submit your own solutions to computer assignments. Keep in mind that the Practice modules are designed to help you to understand the material and also to prepare you for the Mastery modules, so do not rely too heavily on other students for help. Academic dishonesty (either taking or giving answers on a required module, use of extra crib sheets, theft of another's work, etc.) will be dealt with harshly; you will receive an F for the course, and the Ombuds Office will be notified immediately.

Rough Course Outline

0. Motivation and Overview

I. Resistive Circuits   Charge, current and voltage, Ohm's Law and resistance, power, independent and dependent sources, Kirchoff's Laws, nodal and mesh analysis, source transformation, superposition, Thevenin and Norton equivalent circuits, operational amplifiers

II. Basic Time Domain Circuits   Capacitors, inductors, nodal analysis (with R, L, and C), first-order systems (homogeneous and nonhomogeneous), steady-state response, second-order systems

III. Basic Frequency Domain Circuits   Introduction to the Laplace transform, the Laplace transform of circuit components, circuit analysis with the Laplace transform

Modules

ECE 211 Fall 2015
Circuit Analysis I

Overview

The core of the instructional design is a set of 16 modules. The more modules you master the higher your semester grade. There are no exams, and there is no required homework.

Modules are administered by OWL, so you may attempt each one multiple times. Each module is worth 10 points, and you must earn a perfect 10 to earn "mastery".

We want to ensure that credit for mastering modules is awarded fairly and appropriately, so all modules must be attempted in a secure setting.

Modules are administered by OWL in "Exam mode". This means that you receive no feedback until you are finished with the module. You may "resubmit" your answer to a question, but OWL will record and score only your last submission.

For most modules, you are allowed one (1) hour to complete each module. For some of the modules, you will have 75 minutes.

After you are done with a module, you will be able to see exactly which questions and parts you answered incorrectly (if any).

If you feel that an answer you submitted is correct, but it was marked wrong, you should email the instructor, who will hand-grade the question. When you email the instructor, please indicate the module and question you were working on, as well as your answer and the reason that you think your answer is correct.

If you have any questions or concerns, please [send an email to Prof. Leonard](#).

Mastery modules

Twelve modules are "Basic", covering definitions and fundamental techniques, including how to find your own mistakes. Three modules are "Intermediate", integrating topics in groups of Basic modules and encouraging efficient decision-making and strategic problem solving. One module is "Cumulative", integrating all the topics in the course and encouraging even higher level analysis and strategic thinking. See Topics below for a list of modules and their content.

For all modules, there are 12 "Mastery" attempts available on OWL, each listed as a separate assignment. Each assignment is worth 10 points, and if you answer each correctly, you have "mastered" that module. Every assignment is labeled "Required", but you need only master one attempt to earn mastery for that module.

You may _not_ discuss Mastery attempts with classmates. If you have a question about a Mastery attempt, please email or make a private appointment to talk to Prof. Leonard.

Practice exercises

Associated with each set of Mastery attempts is a set of Practice exercises. These should be done on your own. Practice attempts do <u>not</u> count toward your semester grade. This means that if you master a Practice attempt, you must still master a required "Mastery" attempt.

Even though Practice modules are labeled as optional, they will likely become the focus of most of your homework and studies. You can think of them as diagnostic, telling you what you need to work on and understand, and what you do not need to work on. If you have questions about the modules, they must be asked in terms of Practice exercises, for instance, during discussion and office hours.

There will be one or more Practice attempts for each module. Typically, they will be in "Question" mode, which means you can work on each problem individually and receive feedback after each submission of an answer. In this mode, you can also change the question by clicking on "Redo Question" in OWL's nav-bar on the left.

If there are more than one Practice assignment, the first of these will be relatively easy, making it possible to learn the rudiments. The last will be relatively hard, corresponding to the level of difficulty of the Mastery attempts, making it possible to refine your understanding and smooth out more subtle issues. There will also sometimes be one Practice attempt in "Exam" mode, which makes it just like a secure attempt, except that after you submit your exam to be graded, you will be given the correct answers as feedback.

To maximize efficiency and learning, you should always try to answer each practice question to the best of your knowledge. By comparing your answer to the correct answer and trying to reconcile any differences, you will learn quickest. On the other hand, entering a blank answer and trying to reverse engineer the correct answer is often inefficient and too often leads to incorrect ideas and models of how to think about these topics.

Module availability / Mastery points

A typical Mastery assignment will have a due date, which determines in part how many Mastery points you earn if your score is 10/10. Assignments with the earliest due date will be labeled "+6", which means you earn 6 Mastery points for a perfect score, and the actual number of points earned for that attempt is 16. (When you do not earn a perfect score, the number of points earned is your score.) Most modules will also have assignments with a due date about 10 days later, and these will be labeled "+4" or "+2", so they are worth up to 14 or 12 points.

There is always a limited number of +6 attempts, so these are precious, and you should attempt them only when you are reasonably confident you can earn a perfect score. There will be at least four +4 attempts, and usually at least six +2 attempts. Therefore, it is recommended to make +2 attempts first, then switch to +6 attempts once you have some experience. If you run out of +6 attempts, you should have plenty of +4 attempts to master.

On the other hand, if you manage your time poorly, you will not have the opportunity to make any +6 attempts for many modules, and you will need to master the module using +2 and +4 attempts.

Some modules have only +6 and +4 attempts (B6, I1, B7, I2, and B12). When this is true, there are three +6 attempts and nine +4 attempts. Note that two of the +6 attempts are due "early", and the third is due "late". Two modules have only +6 attempts (I3 and C1), and they are due on the last day of Finals.

A chart showing availability of each Mastery level for each module can be found on the "Mastery calendar".

Designated secure site

Mastery modules are administered much like tests, so they must be attempted only at a secure location. There will be a monitor on site at all designated times. You will be required to sign in, show your ID and calculator, and sign out again. If you have not purchased one yet, you will be given an approved scientific calculator to borrow. You are allowed one bound lab notebook to write in. No cell phones, PDAs, etc. are permitted. No books or other resources are allowed. You may not talk to anyone.

The secure site is Marcus 8. Starting Sunday, September 13, and continuing while classes are in session (i.e., until Friday, December 11), Marcus 8 is available 10am–10pm on Mondays, Wednesdays, and Fridays, 2–10pm on Sundays and Thursdays, and 4–10pm on Tuesdays. The schedule during Finals week will be announced during the last week of classes.

To make sure there is a computer available when you want to make a Mastery attempt, you should reserve a time slot. The sign-up sheet is here. (You can start signing up on Friday, September 11.) You are allowed to sign up for at most two 2-hour time slots per week. If you want or feel you need more time, you should go to the secure site when there is a computer available, and you might be allowed to use one of them.

If you have any questions or concerns, please contact Prof. Leonard (5.3513 or leonard@ecs.umass.edu).

Time limits

All of the modules have a time limit. If you have mastered the material, you should not need the entire time given. For most modules, the time limit is 60 minutes. For more challenging modules (B6, I1, I2, I3, and C1), the time limit is 75 minutes (or more).

Feedback

When the time limit has expired or you decide to submit your attempt to be graded earlier, you will receive feedback. For every question, you will be shown your last submitted answer and whether or not your answer is correct. For Practice questions, you will also be shown the correct answer, as well as some suggestions about how to answer the question. (You will <u>not</u> see the correct answers after doing a Mastery attempt.)

Recommendations

We strongly recommend that you complete all Practice attempts at each module before trying a Mastery attempt. We also recommend that you redo questions in the "Question" mode Practice attempts. In other words, do not stop simply because you have answered every question correctly one time. Different questions have different contexts, and you can develop your understanding best by attempting as many as possible.

We also recommend that you continue practicing using one or two of the lowest value Mastery attempts (+2s or +4s, depending on the module). If you master it, you can still attempt a higher value attempt, since only your best score counts.

Note that there are typically 12 Mastery attempts available for each module. Therefore, if you fail to master two or three of these, you should stop making attempts and seek some advice and assistance.

You should keep a bound lab notebook with you during all Mastery attempts, and you should work out all problems in this notebook, sketching the circuits and writing down all equations and values for parameters. This is especially useful when you are asking an instructor questions about a particular attempt.

For a more complete list of recommendations, go to the Suggestions page.

Special needs

If you have a special need, you should tell Prof. Leonard as soon as possible (leonard@ecs.umass.edu). For instance, if you need extended time on tests, please let me know.

Calculators

You will not be allowed to use your own graphing or programmable calculator in the secure setting, and you are not allowed to use it during your Mastery attempts at home. Instead you should purchase a SHARP, model EL-531X (or -531W) scientific calculator. It is recommended that you also use it while practicing, so that you become entirely familiar with its operation and layout. If you would like to substitute another scientific calculator, contact Prof. Leonard, so that he can tell you whether or not it is appropriate.

Topics

The following table shows the content of each of the 16 modules:

Level	Module	Topics
Basic	B1	current, voltage, power, Ohm's law, passive sign convention, units
	B2	KVL, KCL, single-loop circuits, single node-pair circuits
	B3	nodal analysis
	B4	mesh analysis
	B5	source transformations, superposition
	B6	Thevenin and Norton equivalent circuits, maximum power transfer to a load
	B7	op-amps
	B8	capacitance and inductance, voltage-current relationships for capacitors and inductors, equivalent capacitance and inductance, steady-state responses of RC and RL circuits
	B9	energy stored in capacitors and inductors, time constants for RC and RL circuits, source-free RL and RC circuits, unit step function
	B10	parallel RLC circuits, damping, steady-state responses, finding derivatives of responses
	B11	series RLC circuits, damping, steady-state responses, finding derivatives of responses
	B12	Laplace transforms of RLC circuits, finding poles, expanding into partial fractions, inverse transforms

Intermediate   I1   solving resistive networks

                                 I2   finding the complete response in RC and RL networks

                                 I3   finding the complete response in RLC networks

Cumulative   C1   solving DC networks

Grading

ECE 211 Fall 2015
Circuit Analysis I

Overview

This page will tell you how you will be graded in ECE 211, and give you some examples to help you understand the grading system.

Since there are no exams, quizzes, or weekly homework, your grade is almost entirely determined by your best scores on modules. It also depends on your best scores on labs and projects.

The maximum points possible (not including Bonus points) is 496. If you earn at least 350 points (distributed as outlined below), you are guaranteed a C. Every additional 20 points earns 1 grade increment (e.g., C to C+). So, for example, you need a total of 470 points to earn a guaranteed grade of A.

Mastery points

In order to fully understand the grading system, you must first understand what each assignment is worth. Each assignment is labeled with the number of "Mastery" points you will earn with a perfect score, either "+2", "+4", or "+6". Thus, an assignment is worth up to 16 points.

Once a module is visible on OWL, all its associated assignments will be available at the same time. Two +6 attempts are due first, so if you want to be "ahead", you need to master one of these. The +4 and +2 assignments are due two or three weeks later.

Only the best score on a particular module counts toward your total, no matter how many attempts you have made. There are 16 modules in all, for a maximum possible total of 256 points.

Computer exercises

Another component of ECE 211 are simulated labs and computer exercises. You will solve 20 problems using PSpice, MATLAB, or Excel to complement what you are learning in the Mastery modules. Each problem is worth 10 points, with an additional 2 "Mastery" points earned for a perfect score, for a maximum total of 240 points.

The first time you do a lab or project, the typical score on a problem is between 4 and 6. You are encouraged to fix your mistakes and resubmit as often as you can manage. Further, you will need to earn some perfect scores to reach the minimum score.

Bonus points

There are a few ways to earn Bonus points:

- **Fill out a survey.** At least three times during the semester, you will be asked to fill out a survey. You can earn at least 2 points for each. (max = 8)

- **Complete a group of modules.** For each group of modules (with more than one module in it), you earn 2 Bonus points for mastering all of the modules in it. (max = 8)

- **Upload a perfect solution to a computer exercise before its "Bonus" date.** Each computer exercise has a "Bonus" date associated with it. In other words, you can upload your solution at any time before classes end and earn 2 "Mastery" points for each perfect solution, but if you manage your time well, and upload in a perfect solution before its Bonus date, you will earn an additional 2 points. Typically, it takes three or four attempts to be perfect. (max = 40)

Total Score

Your total score is the sum of your best scores on Mastery attempts and computer exercises (including Mastery points), plus any Bonus points you have earned.

Requirements

To earn a C, you must earn at least 350 points, of which:

1. 200 must be from computer exercises, including Mastery points, but not Bonus points; and

2. 150 must be from modules, also including Mastery points, but not Bonus points.

In addition, you must meet all of the following criteria:

3. You must earn at least 6/10 on every Basic module (B1 through B12);

4. You must earn at least 9/10 on both B6 (Thevenin) and I1 (Solving resistive networks); and

5. You must earn at least 10/10 on either B6 or I1.

This will ensure that you are prepared to take ECE 212 (Circuit Analysis II) next Spring and ECE 323 (Electronics I) next Fall.

Note that meeting the minimum point totals for these last three criteria will not automatically mean you have earned a C. In other words, scores of 6/10 on B1 through B5 and B7 through B12 is only 66 points, then, if you earn 9/10 on B6 and the minimum 14 points on I1, that's a total of only 89 points, well below the minimum of 150 points on Mastery modules. Therefore, you will need to fill in with additional points, and it's up to you to decide where those points come from.

If you meet all of these criteria, you have a guaranteed grade of C. However, if you do not meet all five of these criteria, your highest guaranteed grade is C–. If you are close to meeting one or more criteria, talk to Prof. Leonard about your grade.

Grade Increments / Guaranteed Grades

Once you have earned a C, you earn one grade increment (C to C+) for every additional 20 points above 350. The resulting grade is guaranteed. Thus, there is no grading curve, and you are not in competition for grades with your classmates.

Case Studies

Here are three scenarios with best scores on each module/component of the course. "E" stands for computer exercises, and "B" stands for Bonus points. A blank indicates that the module was never attempted.

Scenario	B1	B2	B3	B4	B5	B6	I1	B7	B8	B9	I2	B10	B11	B12	I3	C1	E	B	Total
Typical C	12	12	16	14	12	9	14	6	14	12		12	9	6			210	4	362
Typical B	14	12	16	14	12	14	14	14	16	12	6	14	12	7	2	3	220	12	414
Typical A	16	14	16	16	14	16	14	14	16	14	14	16	14	14	7	6	230	20	471

Scenario 1: Typical C. In this case, you have earned at least a C by meeting the minimum requirements within each category, i.e., earning at least 6/10 on every Basic module, 9/10 on both B6 and I1, and at least 10 on B6 or I1. You have also earned at least 200 points on computer exercises. You have mastered 10 modules, and your total score is 362

points. Note that with a little extra work and planning, by earning just 8 more points, you would have earned a guaranteed grade of C+.

Scenario 2: Typical B. In this scenario, you have again earned at least a C. But instead of just meeting the minimum requirements, you have earned a little extra in each category. For instance, you have mastered a 14 point attempt at B1, and you have mastered everything up to B9. You have even attempted I3 and C1, hoping to earn enough points for a B+. In all, you have mastered 12 modules, and your total score is 414 points, which is a guaranteed grade of B.

Scenario 3: Typical A. This is a likely pattern in order to earn an A: You have mastered 14 modules, including all 12 Basic modules, completing all 4 groups and mastering half of them before the +6 attempts expired; you have earned a nearly perfect score on the computer exercises; you have attempted all 16 modules, earning some useful points on the last two; and you filled out all the surveys. Your total is 471 points, which is enough for a guaranteed A. Therefore, it is useful to start thinking now about what you need to do to earn an A later, so that you don't miss out on essential points along the way.

Time Management / Strategies for Success

Knowing the grading system is not synonymous with being able to plan exactly how you are going to succeed. Further, for many of you, this will be the first time in your academic career that you need to think about how well or poorly you manage your time. You also need to manage your resources, since the number of attempts at each module is limited. Here are some suggestions that might help.

- **Don't delay.** You've probably heard some variation of this mantra at the beginning of every course you have ever taken. Here, the consequences of managing your time poorly are immediate. For instance, two +6 attempts are due two or three weeks before everything else. If you don't master a particular module early, yes, you still have lots of time to make attempts, but you have just lost at least 2 points, because now the maximum score you can get is 14. If you get a late start and lose 2 points on every module you master, that will likely add up to 20 or more points, which is one grade increment lost entirely through poor time management.

- **Find out which module(s) in a group are easiest.** The first module in a group is not necessarily the easiest one to master. For instance, B2 (KVL/KCL) is noticeably harder than B3 (nodal) and B4 (mesh). Therefore, focus on mastering B3 and B4 at the +6 level; you can master B2 at the +4 or +2 level later. Similarly, B7 (op-amps) is a very difficult module to master, possibly the hardest of all the Basic modules. (That is why there are no +2 attempts.) Yet, B8 (caps & inductors) is one of the easiest to master.

- **Move on to the next module when you have earned at least 7/10.** For many people, it is tempting to work on one module at a time, focusing all their attention on it until they have mastered it. The drawback is that it can take two weeks to master a module, and there simply is not enough time in the semester to pass the course using this strategy. Therefore, as soon as you have earned at least 7/10 (or so), you can and should start working on the next module. In many cases, the modules are sufficiently interconnected that what you learn in a later module can be useful for mastering earlier ones. This approach will also help you to master the Intermediate modules.

- **Practice using one or two +2 attempts.** As you are learning how to master a particular module, it might be worthwhile attempting one or perhaps two of the +2 attempts first, which will give you additional practice before you start trying the +6 or +4 attempts. The number of attempts at each level is limited — only two +6 attempts and four +4 attempts per module in many cases — so it is often a good idea to use up some of your +2 attempts first. Otherwise, you risk running out of your more valuable attempts, and you will then only be able to earn 12 or 14 points. And if you master a +2 attempt, great! That will give you confidence when you make a +6 attempt. (And yes, you can master a module more than once. Only the best score counts.)

- **Attempt everything.** Even though some modules might seem "optional" to you, it remains useful to make attempts at them. Your knowledge will deepen and your total score will improve. For instance, only 5/10 on each (I2, I3, and C1) is most of a grade increment, which means you are better prepared for Circuits II. (And I2 is easier than many Basic modules!)

- **Make time for computer exercises, too.** When you are focused on Mastery, it can be hard to shift your attention to the MATLAB, Excel, and PSpice exercises. But the best way to earn a very good score is to pass something in every week. It takes just a little time to make corrections and resubmit the assignments, and in some cases, the assignments will actually help you understand what is happening in the modules. Because you are allowed to resubmit without penalty,

the grading is probably harder than you are used to in other courses. This means that if you plan on passing everything in on the last day, then you will likely not pass the course, because it will be very hard to earn enough points without redoing anything. On the other hand, lots of people will earn a perfect score (240/240) primarily through good time management and perseverance. Further, by uploading a perfect solution before the Bonus date, you can earn up to 40 Bonus points, which is two grade increments earned purely through excellent time management.

- **To earn an A, you do <u>not</u> need to master the +6 attempt at every module.** Even without Bonus points from surveys, lectures, or computer exercises, you can earn an A by mastering all 16 modules, but it does not need to be the 16 point version of each. In fact, because the last two modules are available only as +6 attempts, assuming only that you earn at least 230 points in labs and projects, and you master 12 modules at the 14 point level (and the other four at the 16 point level), you will have earned an A. Mathematically, $12 \times 14 + 4 \times 16 + 8$ (for completing all 4 groups) + 230 = 470 points. In other words, you only need to master two of 14 modules at the +6 level to earn an A. (Of course, the more you master at the +6 level, the easier it will be to earn an A.)

OWL (Online, Web-based Learning)

The OWL system (Online, Web-based Learning) administers all of the Practice exercises and Mastery attempts for this course. It also administers periodic surveys, lecture and how-to links, and information pages associated with the Practice exercises.

To login to the OWL system, go to...

https://owl.oit.umass.edu/owl-c/user/loginpage.cgi?UserType=Student&Server=owl-eleccompeng

If this doesn't work, go instead to http://owl.oit.umass.edu and look for "Electrical and Computer Engineering" under **University of Massachusetts Amherst Courses**.

Your login is your OIT NetID and password.

Note that your official email address is [your NetID]@umass.edu. All emails will go to this address, so please set it up, as you will likely receive a minimum of a few emails every week. If you use a different account, you will need to have the emails forwarded to your preferred account.

A local phone number is useful, in case I need to contact you. (Click on "My Account", then choose "Change your account information".)

You should see lots of assignments. These are your "Current Assignments" in which the topmost in the list are the assignments that are due first. Click on the "All Assignments" tab to reach the underlying folder structure.

The "Surveys and Tutorials" folder contains two tutorials and an information page that summarizes the tutorials. These will help you learn the syntax for entering answers in OWL, as well as how to navigate within an assignment in "Exam" mode (the same mode as all of the Mastery assignments).

The "Video Links" folder contains two pages of links, one for the recorded lecture videos, and the other for the recorded "how-to" videos.

The "Practice Exercises" folder contains all of the assignments you will use to prepare for Mastery attempts. They are usually in "Question" mode, which means you can focus on one question at a time, receiving feedback after every answer you submit to be scored. These will all be labeled with a "Q", e.g., Practice B1-1Q. Some of the assignments are in "Exam" mode, to help you to experience what the assignment will be like in Mastery. Note that none of these assignments count toward your final grade.

The "Mastery Attempts" folder contains all of the assignments you will use to demonstrate your knowledge and skills in Circuit Analysis. All of them are marked "Required" even though you do NOT need to do all of them. Only your best score counts on any particular module.

It's usually best to start by looking at some Practice exercises, but you should not answer anything. Just read the questions and look at the figures. This will help you listen more effectively to the lectures. Once you are finished with a set of lectures for a particular module, you can move on to the Practice exercises. When you are beginning to have confidence in your knowledge and skills, you can start making Mastery attempts. Most people start with the +2 attempts (or +4s, if no +2 attempts are available) as additional practice before moving on to the more valuable attempts (+6s or +4s).