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Course Information

Course Credits: 4 credits hours

Course Website: https://ecse.rpi.edu/courses/S22/ECSE-1010/

or simply http://intro-ece.org

Instructor

Prof. Santiago Paternain

Contact information: paters@rpi.edu
Office Hours: Thursdays 2pm-4pm
Office Hours Location: JEC 6034 or WebEx Teams

Teaching Staff

Name	Office	Section	Hours	Email
TBD	TBD	TBD	TBD	TBD

Class Schedule and Location

Class Time: Mondays and Thursdays 10:00 to 11:50 AM eastern.

Location: JEC 4104.

Online Tools

The following online tools will be used to support this course. If you do not have access to any of these tools, please inform the instructor as soon as possible.

WebEx Teams: WebEx Teams for this class will be created in case we need to pivot to hybrid or remote instruction. Smartphone app available.

Piazza: Piazza platform will be used for class related communication, announcements, organizing class logistics, Q and A, discussions. The platform is highly catered to getting you help quickly and efficiently from classmates, the TAs, and the professor. Rather than emailing questions to the teaching staff, please post your questions on Piazza. There's also a nice smartphone app you should download. https://piazza.com/rpi/spring2022/ecse1010

Gradescope: All activities/experiments and quizzes submissions and grading will be done through this platform. If you aren't familiar with this tool, there are guides (document and video format) available on Piazza under the "Resources" tab.
https://www.gradescope.com/courses/341238

Blackboard: LMS will be used for Problem Sets (PS). Refer "Course Assessment Measures" and "Assessment Policies" sections below for details about problem sets.

https://lms.rpi.edu

YouTube: Playlist to host pre-recorded video content that students are required to watch before each class. Video links are on the course website (under Resources by Class Day).

https://www.youtube.com/playlist?list=PLlutgI5N-Pzvy4xqbdwAGR7xQ95gCUZ8d

Course Description

The overall goal of this course is to help EE and CSE students build a broad analysis skill set so that through experimentation, simulation and the application of science, mathematics and engineering fundamentals, they can develop useful systems models that enable engineered solutions addressing a broad array of societal needs.

Course Text

None

Supplemental Reference

See https://www.ecse.rpi.edu/courses/F21/ECSE-1010/

Required Software

(Installation instructions on course Website)

1. LTspice (circuit simulation)
2. Alice 1.3 (Software application for M1K)
3. Pixel Pulse 2 (Software application for M1K)
4. Waveforms (if using Analog Discovery 2)
5. Matlab (numerical analysis)

Student Learning Outcomes

1. **Experimental Methodology**: Students will be able to build and make reliable time-dependent measurements of simple analog and digital circuits, exporting data to display and analysis tools (e.g. Excel, MATLAB), and demonstrate understanding of results by describing key data features and comparing with simulation and analysis. Extract useful information from component datasheets.

2. **Simulation Methodology**: Students will be able to create circuit simulations using a commercial SPICE program and produce reliable voltage and current plots (functions of both time and frequency), exporting simulated data to display and analysis tools and demonstrate understanding of results by describing key data features and comparing with experiment and analysis.

3. **Mathematics and Analytic Methodology**: Students will be able to apply precollege circuit knowledge to real circuits, analyze simple circuits based on voltage dividers and

inverting/non-inverting op-amps, apply phasor analysis to simple combinations of R, L and C components and apply all analysis skills to demonstrate understanding of experimental and simulated data for simple circuits. Apply the basic matrix arithmetic used in circuit analysis, circuit simulation and in the display and analysis of data using tools like Excel and MATLAB.

4. **Design Methodology**: Students will be able to modify existing circuit designs for specific applications and fully characterize the operation of the circuit using experimental, simulation and analytic methods.

Course Assessment Measures

Assessment	Due Date	Learning Outcome #s
Quiz 1	February 7th	1, 2, 3, 4
Quiz 2	February 28th	1, 2, 3, 4
Quiz 3	March 31st	1, 2, 3, 4
Quiz 4	April 25th	1, 2, 3, 4
Experiments	Daily except quiz days	1, 2, 3, 4
Problem Sets	Daily except quiz days	1, 2, 3

Grading Criterion

Quizzes	10% each
Experiments	30%
Problem Sets	20%
Attendance and Participation	10%

Assessment Policies

Quizzes:

- All students are expected to take the four quizzes during the semester.
- The quizzes will be on quiz days mentioned in "Course Assessment Measures" section above.
- Each quiz duration will be 1 hour 50 minutes.
- Logistical details about quizzes will be provided before quiz days.
- Quizzes are individual assessments, and each student is expected to work through them independently.
- All quizzes are open book, open notes.
- If you require adjustments for learning disabilities, letters from the Dean are to be submitted at the beginning of the semester.

Experiments:

- Experiments for each class day will be available on the course website under "Resources by Class Days" section.
- Experiment reports are due electronically on Gradescope.
- You are encouraged to work in groups of 2 students to complete experiments. You may choose to work by yourself.
- Experiment reports, one per group, need to be submitted on Gradescope.
- Experiments are due two class days after they are assigned. The assignment class # is included in the title of each experiment.
- Experiments turned in late will receive the following penalties: 10% per day late (no penalty over weekends).
- Discussion is encouraged; however, each student team should submit their own experimental findings and analysis.
- Help sessions will be arranged on most weekdays for you to get help on experiments. These help sessions will primarily be during evening times, i.e. after 6pm eastern.

Problem Sets (PS):

- Problem sets are assigned and due on LMS.
- There is a Problem Set associated with every class day (except for quizzes).
- The Problem Set # (i.e. PS #) corresponds to the Class # for the material addressed.
- Problem Sets are released before 12 noon eastern of the day indicated on the calendar and is to be completed by 11:59 pm eastern of the next class day.

- It is always possible to attempt Problem Sets more than once. Any attempts completed by the due date & time will receive full credit.
- For example, PS#5 is to be completed (for full credit) by the 11:59pm on the day of Class #6. Problem sets completed after the due date receive half credit. Late problem sets will be available for two more class days, i.e., three class days after the original assignment.
- Problem sets are individual assessments; however, you are welcome to discuss ways to answer with other students in class. Exchanging the answers will be considered as academic misconduct.

Attendance and Participation:

- It is important to stay on schedule in this class. You and your partner work together on experiments.
- The instructors may choose to take formal attendance. We will be monitoring if you are coming to class or not and are working with your partner to complete experiments.

Participation grade will depend on your interactions with the instructors and teaching staff.

It is based on the following criteria:

- Your instructor will assess your general performance in terms of how much you contributed to the work your group was doing during class time.
- Your TA's will assess your general performance in terms of how much you contributed to the work your group was doing during class time.
- Periodically, you will be asked questions by the staff which we use to judge how well you understand what is going on. These questions fall into four categories: circuits (Do you know how to wire and debug a circuit using the diagram?), equipment (Can you correctly hook the circuit to the equipment?), theory (Do you understand the theory that was taught in the lecture?) and software (Can you effectively use the computer tools we use in the experiments?).
- Examples of contributions to the work your group does include: (1) Preparation for class; (2) Interesting questions raised in class and on piazza; (3) Creative approaches to completing assigned work; (4) Effectively getting help when needed; (5) Clear demonstration of improved understanding of concepts; (6) Feedback on course materials that were particularly helpful; (7) Providing answers to questions on piazza; (8) Identifying errors or points of confusion in course materials, including homework; etc. From this list, you can see that participation is just being engaged in the course, helping your partner and other students learn and the TAs and instructor do their job better.

Extra-Time Accommodations:

If you require extra time on exams or another form of accommodation, please contact the Dean of Students Office and email me a copy of the DSS note. Please do this early in the term so that we have plenty of time to plan.

General Course Policy

Collaboration and Academic Dishonesty: Intellectual integrity and credibility are the foundation of all academic work. A violation of Academic Integrity policy is, by definition, considered a flagrant offense to the educational process. It is taken seriously by students, faculty, and Rensselaer and will be addressed in an effective manner. If found responsible for committing academic dishonesty, a student may be subject to one or both types of penalties: an academic (grade) penalty administered by the professor and/or disciplinary action through the Rensselaer judicial process described in this handbook. Three relevant academic integrity violations to emphasize include:

Collaboration: Collaboration is defined as deliberately facilitating an act of academic dishonesty in any way or form; for example, allowing another student to observe an exam paper or allowing another student to ”recycle” one’s old term paper or using one another’s work in a paper or lab report without citing it as another’s work.

Copying: Copying is defined as obtaining information pertaining to a graded exercise by deliberately observing the paper of another student; for example, noting which alternative a neighboring student has circled on a multiple-choice exam.

Plagiarism: Plagiarism is defined as representing the work or words of another as one’s own through the omission of acknowledgment or reference. Examples include using sentences verbatim from a published source in a term paper without appropriate referencing, or presenting as one’s own the detailed argument of a published source, or presenting as one’s own electronically or digitally enhanced graphic representations from any form of media.

The Rensselaer Handbook of Student Rights and Responsibilities defines the full list of forms of Academic Dishonesty and you should make yourself familiar with these. In this class, all assignments that are turned in for a grade must represent the student’s own work. In cases where help was received, or teamwork was allowed, a notation on the assignment should indicate your collaboration. If you have any questions concerning this policy before submitting an assignment, please ask for clarification.

Students in this course should be aware that the items emphasized above also apply to the experimental/simulation data, Matlab code generated by each student or student team

towards the completion of the experiment report. Tools exist to detect similarities between files and the staff reserves the right to employ such tools to deter code based academic dishonesty.

Covid-19 Related Information

We are committed to the health and safety of students as well as a high-quality educational experience. Rensselaer continues to monitor new developments regarding covid-19 and determine a best course of action to support student well-being and outstanding education.

- **Masks**: Wearing a mask in public can help prevent the spread of COVID-19. Masks should be worn by all students in this class and while in the building. Students violating this policy will be requested to leave classroom/building and return to their living quarters; they will also be reported to the Dean of Students for appropriate sanctions per code of conduct expectations.
- **Traffic Flow and Social Distancing**: We expect students and faculty to follow social distancing protocols. You are expected to follow posted traffic flow directions as well as any instructions by the instructor aimed at reducing congestion.
- **In-Class Seating:** Students will sit only in the appropriate designated seating in the classroom, to ensure social distancing. Moving furniture or sitting in undesignated seats is not permitted.
- **Cleaning of Spaces**: Students are encouraged to clean the surfaces of the chairs/tables/desks they occupy before they sit down and as they prepare to leave.
- **Student Health**: Students who are ill, under quarantine for COVID-19, or suspect they are ill will report that to Student Life. Every reasonable effort to accommodate the student absences will be made. Students who need to report an illness should contact the Student Health Center via email (healthcenter@rpi.edu) or call 518-276-6287. Student seen by an off campus doctor may request an excused absence via www.bit.ly/rpiabsence using appropriate documentation.
- **Refusal**: Refusal to comply with any appropriate request will be treated as would any classroom disruption and disciplinary actions and sanctions will be taken through judicial process outlined in the Student Handbook.