

## ECE 330 Power Circuits & Electromechanics, Fall 2024

### Instructor:

Section C- MWF (9:00-9:50 am) 1015 ECEB: Prof. Olga Mironenko

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Section N- MWF (2:00-2:50 pm) 3017 ECEB: Prof. Jonathon Schuh

Office Rm. 4062 ECEB, email: [schuh4@illinois.edu](mailto:schuh4@illinois.edu)

### Teaching Assistants:

TA1: TBD

TA2: Ryan Horstman ([ryanjh4@illinois.edu](mailto:ryanjh4@illinois.edu))

TA3: TBD

### Office Hours (all Mondays, location: TBD):

Prof. Mironenko: 11:00am-12:00pm

TA 1: 12:00pm-1:00pm

Prof. Schuh: 1:00pm-1:50pm

TA 2: 3:00pm-4:00pm

TA 3: 4:00pm-5:00pm

**Course Text:** Power Circuits and Electromechanics (Paperback Version) by M.A. Pai, Stipes Publishing, Champaign

### Course Outline

	<b>Hrs</b>
1. Review of phasors, complex power	3
2. Three phase circuits, three phase power, wye-delta conversion	4
3. Magnetic circuits, self and mutual inductance, Maxwell's equations	5
4. Ideal transformers, practical transformers, equivalent circuits	<u>4</u>
5. Electromechanical systems, energy, co-energy, energy cycles, computation of forces	6
6. Synchronous machines	<u>3</u>
7. Induction machines	3
8. Other machines	3
9. Dynamic equation, numerical integration of electromechanical systems	4
10. Equilibrium points, linearization, stability	<u>3</u>
11. Exams and review	4

## Course Logistics:

- Canvas. Check Canvas for homeworks, course material, quiz, and exams scores. Have an administrative or technical question? Ask on the discussion forum.

### Illinois Canvas

As the online learning management system for Illinois, Illinois Canvas lets students, faculty, and staff check grades, submit assignments, and store and download instructional and training materials. It is possible to use Illinois Canvas from any computer, tablet, or phone. For a list of help topics, please visit [Illinois Canvas Training Resources for Students](#).

## Evaluation:

### • Homeworks:

- Throughout the semester, you should expect a total of 10 homework assignments.
- These assignments do not count for credit but are designed primarily to help you practice the material that will be covered in quizzes and exams.
- HW assignments will be hosted on **PrairieLearn**.
- You will have an unlimited number of attempts for each homework assignment.
- Please be aware that when the corresponding quiz window becomes available on PrairieLearn, the corresponding homework will be temporarily closed. The homework will become accessible again once the quiz window has been closed.

### • Quizzes:

- Throughout the semester, you should expect a total of 10 quizzes.
- Quizzes **count for credit** and are based on the material covered in a corresponding homework.
- Quizzes will be hosted on **PrairieLearn**. Final grades will be posted on Canvas.
- Typically, quizzes are open on Mondays at 6 PM and are due on Tuesdays at 11:59 PM. Please check the schedule on Canvas for exact dates. **Late assignments are not accepted.**
- **No extensions are allowed.** However, to provide students some flexibility and to accommodate for emergency situations, travel etc., two lowest quiz scores will be dropped from the quiz average used to compute the final grade.
- Quiz solutions will become available on Canvas once the quiz window has been closed.
- The quizzes are open book, open note, but they must be completed individually.

- **Partial credit:** Before submitting the quiz, make sure to upload a scan or picture of the work you used to solve the quiz problem. Your preliminary score issued by the automated system may be adjusted upwards (but never downwards) for partial credit based on submitted work.  
**NOTE:** attach your work **BEFORE** you submit your quiz on PrairieLearn. **Work that is submitted by email will not be accepted!**
- Course staff will not answer questions while the quiz for the week is open on PrairieLearn. We will respond to questions after the quiz window closes.
- Regrades: Email your instructor directly about possible questions regarding grading **within a week (7 days)** after the grades are released on Canvas. Any requests outside the 7 day window will not be honored.
  
- **Exams:**
  - Two midterm exams: 7-8:30 pm on Thursday, October 3 and Thursday, November 7, 2024. Location: TBD.
  - Final Exam: TBD
  
- Allowed material:
  - This exam is closed book and closed notes. You will be provided with an equation sheet for the exam. No other notes are allowed. Use of any external resources will result in a 0 on the exam and an **Academic Integrity report** being filed against you.
  
- Calculations:
  - Standard scientific and graphing calculators are allowed and expected on the exam. No other electronic devices are allowed. The use of prohibited calculation devices will result in an **Academic Integrity report** being filed against you.
  
- No collaboration allowed:
  - You are **not allowed** to share or collaborate on this exam and all work should be your own; otherwise, it will result in an **Academic Integrity report** being filed against you.
  
- Solving the exam
  - You must show all your work on the exam and provide explanations when needed to receive credit. Any answer without any work will receive no credit and an **Academic Integrity report** may be filed. Please note, that writing just the formula from the provided equation sheet will not result in partial credit.

- Regrades
  - You will receive an email from Gradescope to log in and see your graded exam. If **after** looking at the posted solutions, you feel there was an **inaccuracy** in the grading of your exam, you can request a regrade within Gradescope itself.
  - Regrades should be used only to correct mistakes made in grading. Regrades are not to be used for getting back more partial credit on your exam. Only regrades regarding inaccurate grading will be addressed.
  - Regrades open 24 hours after exam scores are posted and must be submitted **within 7 days**. Regrades will **not be accepted** after that date.
  
- **Conflict exam requests**
  - Some of you might have an overlapping activity that warrants a conflict exam, as indicated in the [Article 3 part 202](#) of the student code (please see [Article 3 part 201](#) for a conflict with a final exam). We will offer a conflict exam in those cases, but you need to get the approval of the instructor in order to be able to take the conflict exam. All students will receive an email with a link to request a conflict two weeks before each exam. If you have a conflict with the exam, you must complete the form before the corresponding deadline.
  
- **Absence from midterm exams**
  - If for some reason of emergency such as severe illness, family emergencies, or other uncontrollable circumstances you are not able to take the exam at the required time, you will need to obtain a written excuse from the [Office of the Dean of Students](#). Documentation which validates the absence is required by the Dean's Office to provide the absence letter.
  
- **Absence from the final exam**
  - If for some reason of emergency such as severe illness you are not able to take the final exam at the required time, you will need to contact the [Office of the Dean](#) of Students and request [Incomplete grade](#).

**Grading:**

**It is a student's responsibility to check that the correct grades are entered on Canvas.**

Two midterm exams	25% each
Final exam	35%
Quizzes	15%

## Other Course Policies:

### ▪ **Communications:**

- It is the student's responsibility to attend lectures and check their emails daily in case there are announcements from the course staff. Missing a lecture and/or not checking email will not excuse complying with the course deadlines and policies.

### ▪ **Accommodations:**

- We are happy to accommodate all DRES needs for our students. Please forward your DRES letter to your instructor **as soon as possible**, but **no later than 1 week** before the midterm exam/quiz (December 1<sup>st</sup> for the final exam).
- You can contact DRES at 1207 S. Oak Street, Champaign, (217) 333-1970, via email at [disability@illinois.edu](mailto:disability@illinois.edu) or via the [DRES website](#).
- All DRES exams will be taken at the Testing Accommodation Center (TAC). Please get familiar with the [TAC policy, registration and the deadlines](#). Although, it is the student's responsibility to register with the TAC for each exam, please contact your instructor with the DRES letter before taking any actions.

### ▪ **Religious Observances:**

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus **at the beginning of the semester** for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should fill out the [Religious Accommodation Request form](#) and forward it to your instructor.

**This must be done in the first two weeks of classes for midterms and within a week after being informed of the final examination schedule.**

### ▪ **Emergency Response Recommendations**

Emergency response recommendations can be found at the following website: <https://police.illinois.edu/em/>. We encourage you to review this website and the campus building floor plans website within the first 10 days of class. <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>.

### ▪ **Academic integrity:**

Academic dishonesty will not be tolerated. Examples of academic dishonesty include the following:

- Cheating
- Fabrication
- Facilitating infractions of academic integrity
- Plagiarism

- Bribes, favors, and threats
- Academic interference
- Examination by proxy
- Grade tampering
- Non-original works

Should an incident arise in which a student is thought to have violated academic integrity, the student will be processed under the disciplinary policy set forth in the [Illinois Academic Integrity Policy](#). If you do not understand relevant definitions of academic infractions, contact your instructor for an explanation within the first week of class.

### **Anti-Racism and Inclusivity Statement:**

The intent is to raise student and instructor awareness of the ongoing threat of bias and racism and of the need to take personal responsibility for creating an inclusive learning environment.

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender, and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to [Campus Belonging Resources](#). Based on your report, Campus Belonging Resources members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

***We in the Illinois ECE community are committed to understanding, empathizing with, and respecting each other, embracing the many differences among us.***

**Sexual Misconduct Policy and Reporting:**

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the university's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated university employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found in the [Confidential Resources](#) section. Other information about resources and reporting is available at [wecare.illinois.edu](http://wecare.illinois.edu).

**Student Wellness Resources:**

The University of Illinois strives to promote student success through the support of student psychological and emotional well-being. Please take advantage of the resources listed on the [Student Affairs](#).