

**The University of Texas at El Paso**

College of Engineering

Department of Electrical and Computer Engineering

**Course Syllabus**

**ECE3310 Energy Conversion**

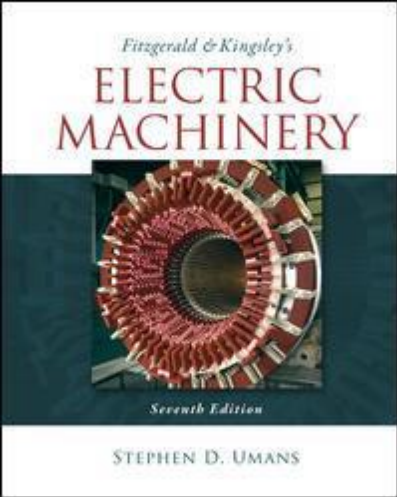
**Fall 2025**

**Course Information:**

**Classroom:** Liberal Arts Building 208

**CRN:** 17500

**Class Time:** MW 6:00 pm - 7:20 pm

<b>Instructor:</b>	Eric Galvan
<b>Office:</b>	
<b>Phone:</b>	
<b>Email:</b>	<a href="mailto:egalvan4@utep.edu">egalvan4@utep.edu</a>
<b>Office Hours:</b>	Wednesday 7:30 pm - 8:30 pm Others: by appointment
<b>Text:</b>	<ul style="list-style-type: none"><li>• Fitzgerald &amp; Kingsley's Electric Machinery</li><li>• Authors: Stephen D. Umans</li><li>• Publisher &amp; Edition: McGraw Hill, 7th Edition</li></ul> 
<b>References:</b>	<ul style="list-style-type: none"><li>• Lecture Notes provided by the instructor.</li></ul>
<b>Prerequisite</b>	<ul style="list-style-type: none"><li>• ECE 3320 Electromagnetic Field Theory, PHYS 2420 each with a grade of C or better and/or department approval.</li></ul>





**Course Description:** Fundamentals of electric machines. Basic principles of electromechanical energy conversion. Energy balance, force, and torque of electromagnetic system. Transformers in three-phase circuits. AC and DC machines including analysis, dynamic characteristics and equivalent circuits of induction and synchronous machines. Single- and two-phase motors.

**Course Objectives and Learning Outcomes:** This course provides students with basic concepts and principles of Electric Machines and Electromechanical Energy Conversion. Upon successful completion of this course, students will be able to:

1. Understand the terminology used in conjunction with magnetic circuits and magnetic materials.
2. Understand the magnetically coupled windings that are at the heart of transformer performance.
3. Apply the concepts and techniques of electromechanical energy conversion principles to a wide range of engineering applications.
4. Apply various techniques and approximations involved in reducing a physical machine to simple mathematical models.
5. Analyze the steady-state performance of polyphase synchronous machines.
6. Study the behavior of polyphase induction machines.
7. Understand the versatility of dc machines and their use in a wide variety of applications.

**EDGE Advantages**

This course is designed to equip students with essential Edge Advantages that contribute to their professional and personal development. Through the completion of course requirements and assignments, such as team projects, presentations, and essays, students will develop the following Edge Advantages:

	Problem-Solving	Assignments will challenge students to identify and address complex issues using innovative and analytical approaches.
	Communication	Class discussions and written assignments will improve students' skills in articulating ideas clearly and persuasively in both oral and written forms.
	Confidence	By actively participating and successfully completing assignments, students will build self-assurance in their abilities to tackle academic and real-world challenges.
	Critical Thinking	The course's emphasis on analysis and synthesis of information will strengthen students' abilities to think critically and make informed decisions.

**Course calendar and topics covered (Tentative):**

1. Magnetic Circuits and Magnetic Materials
2. Transformers
3. Electromechanical-Energy-Conversion Principles
4. Introduction to Rotating Machines
5. Synchronous Machines
6. Polyphase Induction Machines
7. DC Machines
8. Single- and Two-Phase Motors

**Grades will be given based on following distribution:**

Homework Assignments	30%
Quizzes	10%
Attendance	10%
Mid-term Exam	25%
Final Exam	25%
Total	100%

**Grading Scale:**

A	100-90%
B	89-80%
C	79-70%
D	69-60%
F	59-0%

**Course Communication:** How we will stay in contact with each other

- **Office Hours:** I will have office hours for your questions and comments about the course. My office hours are in-person, however, you can request a virtual meeting and I will send you a Ms Teams meeting invite. Please see the days and times at the top of this syllabus.
- **Email:** UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24 hours of receipt. When e-mailing me, be sure to email from your UTEP student e-mail account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

**Software:** Students will use Matlab for assignments and projects. Each student must have the software installed on their laptop, personal computer or device.

**Calculator:** Basic scientific or non-programmable calculator is required for calculations. Students can only use basic scientific or non-programmable calculator during exams. It is the student's responsibility to always have their calculator ready for in-class assignments and exams.

**Blackboard:** Course materials such as lecture notes, syllabus, homework assignments, simulation projects, and announcements will be given in class and will also be available in the course blackboard.

**Assignments:** The homework assignments must be turned in by the due date. Late assignments will be decreased one letter grade per day late from the actual homework grade.

**Quizzes:** Announced quizzes will be given at the beginning of the class. No make-up quiz will be given if you are late or absent without valid reason.

**Exams:** A midterm exam will be given the week of **October 13-15, 2025**

**Final Exam:** The final exam is comprehensive and is given in accordance with the University's Final Exam schedule, **Wednesday, December 10<sup>th</sup>, 2025 7:00 pm – 9:45 pm.**

**No Use of Cell Phones, Laptops, Tablets or Other Devices on Exams.**

**Class Participation and Activities:** There will be class group and individual activities. In order to get a grade for them you must participate in the activity.

**There will be No Make up for exams, quizzes, presentations, assignments, or any assigned tasks.** However, in case of pressing circumstances, make up will only be allowed for students with medical reason that prevents their attendance (written notification from doctor required), military duties (notification to be provided in advance), and for other compassionate reasons. Business related activities, car problems, and over sleeping are not considered compassionate reasons.

**Course Drop Deadline:** The deadline to drop this course with an automatic W is **October 31<sup>st</sup>, 2025.**

**Attendance:** Attendance is mandatory. When absent, the student is responsible for obtaining notes, handouts, and assignments and for meeting the same deadlines as the rest of the class. Excused absences are limited to documented medical emergencies, religious holidays and UTEP sponsored and/or required activities.

**Cell Phone and Laptop Policy:** Cell phones are not permitted during the lecture. Laptops may be used during assignments as specified by instructor. Students are required to turn off cell phones before entering the classroom. Cell phones should be placed out of sight (like in a purse or backpack). Students should NOT receive or make any calls/text messages during class. Students using cell phones during class will be asked to leave and will receive a zero for attendance and on all group assignments completed that day.

**Illness Precautions:** Please stay home if you have symptoms of a communicable illness. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations.

### **Institutional Policies**

**Academic Honesty:** Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves

collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Community Standards (<https://www.utep.edu/student-affairs/standards/>) for possible disciplinary action. To learn more, please visit HOOP (<https://www.utep.edu/hoop/section-2/student-conduct-and-discipline.html>): Student Conduct and Discipline.

**Center for Accommodations and Support Services (CASS):** The University is committed to providing reasonable accommodations to students with documented disabilities. Students who become pregnant may also request reasonable accommodations, in accordance with state and federal laws and regulations and University policy. Accommodations that constitute undue hardship are not reasonable. To make a request, please register with the UTEP Center for Accommodations and Support Services (CASS). Contact CASS at 915-747-5148, email them at [cass@utep.edu](mailto:cass@utep.edu), visit their office located in UTEP Union East, Room 106, or apply for accommodations online via the CASS portal. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

**Harassment:** Members of the UTEP community are protected from discrimination and harassment by State and Federal Laws. Jokes, comments of sexual nature, as well as racist comments will not be tolerated. The student that violates this rule will be sent to the Dean of Students for disciplinary action.

**Guidance on Artificial Intelligence:** Some AI technologies or automated tools, particularly generative AI such as ChatGPT, can be beneficial during the early brainstorming stages of an activity, and you are welcome to explore them for that purpose. However, keep in mind that AI-generated ideas are not your own and may hinder your ability to think critically and creatively about a problem. It is also important to remember that these technologies often “hallucinate” or produce materials and information that are inaccurate or incomplete—even providing false citations for use.

That said, you are not allowed to submit any AI-generated work in this course as your own. If you use any information or materials created by AI technology, you are required to cite it like you would any other source. Any direct use of AI-generated materials submitted as your own work will be treated as plagiarism and reported to the Office of Community Standards (<https://www.utep.edu/student-affairs/standards/>).

**Copyright Notice:** Materials presented and posted within this course are protected by copyright laws. The materials presented during this course are only intended for use of students enrolled in this course and for the duration of the course.

**Disclaimer:** The content of this Syllabus may subject to change within reasonable limits according to instructor’s discretion. Any changes will be announced in blackboard and in the class.