
Lane Department of Computer Science and Electrical Engineering

EE 336: Electro-Mechanical Energy Conversion Lab

Fall 2019

1 - Credit hour

Instructor:	Talha Iqbal Office: 304 AERB Email: <i>ti0001@mix.wvu.edu</i> Office Hours: MTW 4-5PM		
Class Location:	ERB-219, ESB-215		
Class Time:	001	W	5:00 PM-7:50 PM
	002	T	5:30 PM-8:20 PM
	003	M	5:00 PM-7:50 PM
Reference Book:	Electrical Machinery and Power System Fundamentals, By Stephen J. Chapman, McGraw Hill		
Course Objectives:	To acquaint the students with the performance and characteristics of magnetic devices, single-phase transformers, DC and AC machines and synchronous generator connected to a large power system by a Power system simulator, Modeling and simulation of Induction and DC machine and DSP based Drive System.		
Expected Learning Outcomes:	By the end of this course student's will be able to: Understand Faradays Law in Coil with permanent magnet. Analyze the excitation magnetizing and core losses and calculate the parameters of the transformers by conducting short circuit and open circuit tests. Analyze the voltage current characteristics of the DC generator and learn how to start the motor in the laboratory and simulate the DC motor using MATLAB/Simulink. Perform open loop control of DC motor. Understand the voltage characteristics of the Synchronous generator under different loading conditions.		
Grade Distribution:	Attendance	10%	Portfolio 10%
	Prelabs	10%	Project 30%
	Lab Report	30%	Final Exam 10%
	Grading will be on a scale of 100		

Grading Policy:	A >= 90 %	C 70 - 79.99 %	F < 50 %
	B 80 - 89.99 %	D 50 – 69.99 %	

1. Lab Guidelines

1.1. Class Policy

- Attendance in the lab is mandatory. You cannot perform the experiment if you miss the lab and will not be awarded grade for the missed lab. Always try to be on time.
- The grades can only be contested on the day, when the lab/pre-lab is returned.
- No grade will be awarded at the end of semester for failing to submit lab/pre-lab in time.
- Copying of the prelabs and/or lab reports is strictly prohibited, if found all parties involved will be awarded ZERO grade.
- All safety rules in the Power Laboratory Safety sheet **MUST** be strictly adhered to all the times.

1.2. Pre-lab

Every student must submit the Pre-lab before start of the lab instructions, the purpose of the pre-lab is to do some individual work, so late pre-lab submission cannot be accepted.

1.3. Lab Report

- Each experiment requires a Formal Group Report, which needs to be submitted before the start of next lab i.e. after the completion of the experiment.
- All figures and tables should be REFERENCED in the text and have a number and title.
- Lab reports should be according to the Lab Report Format provided at the end of Lab handouts.
- All students in a group will receive the same grade for the Lab report given that they were present while doing the experiment.
- Include all the calculations related to the experiment in your lab report.

1.4. Portfolio

- Each Group should maintain a Lab Portfolio, which should contain a record of all the handouts, handwritten notes (taken in class) and calculations/measurements done in the lab.
- Your lab portfolio must be submitted by the end of the semester and it will be graded.
- All students in a group will receive the same grade on Lab portfolio.

1.5. Lab Project

At the end of the semester, a lab project will be assigned to each group. Each group is required to submit their project results in the form of a Formal Project Report.

1.6. Final Exam

Final exam will be comprehensive, closed book and closed notes. The exam will cover lab discussions, experiments, pre-labs and any other thing covered in the lab.

2. Tentative Schedule:

Week	Date	
1	Aug 21, 26, 27	Introduction
2 – 3	Aug 28, Sep 3,4, 9,10,16	Faraday's Law in Coil with permanent magnet and DC excitation, PreLab-1 due
4 – 5	Sep 11, 17, 18, 23, 24, 30	Simulating Three-Phase Circuits in MATLAB/Simulink, Hysteresis Curve of a Single-Phase Transformer, PreLab-2 due
6 – 7	Sep 25, Oct 1, 2, 7, 8, 14	Impedance Transformation and Transmission Line Losses PreLab-3 due Mid-Term Grades due (Atten., PLs 1-2, LRs 1-2)
8 – 9	Oct 9, 15, 16, 21, 22, 28	Single-Phase Transformer Model i.e. open circuit and short circuit Tests PreLab-4 due
10 - 11	Oct 23, 29, 30 Nov 4, 5, 11	Voltage and Current Characteristics of a DC generator, PreLab-5 due Project Assignment
12 - 13	Nov 6, 12, 13, 18, 19, Dec 2	Voltage Regulation of Synchronous Generator and DC Motor Speed Control PreLab-6 due
14	Dec 3, 4, 9	Final Exam, Project Due (Demo & Report Submission)
15	Dec 13 th	Final Grades on ecampus (no changes after Dec 20 th)

This is a tentative schedule of the experiments and can vary depending on the course schedule.

Social Justice:

West Virginia University is committed to the Social Justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color and national origin. Any suggestions as to how further and open the environment in this class, will be appreciated and given serious consideration. If you are a person with disability and anticipate any type of special accommodation for the participation in the class, please advise me and make appropriate arrangements with Disability services (293-6700).