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Fall 2015

ENEE 3518

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University of New Orleans

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*Department of Electrical Engineering
The University of New Orleans*

**ENEE 3518-001
Electrical Engineering Laboratory**

Fall 2015

ENEE 3518 Electrical Engineering Laboratory

1 cr.

A laboratory in basic electronics, instrumentation, and electric power devices for students not majoring in electrical engineering.

PREREQUISITE: Credit or registration in ENEE 3501.

TEXTBOOKS: None.

REFERENCES: C. K. Alexander and M. N.O. Sadiku, *Fundamentals of Electric Circuits*, 5th edition, McGraw-Hill Higher Education, 2012. (Or any other circuits textbook adopted in ENEE 3501.)

CLASS SCHEDULE: Monday 12:30 to 3:00 pm, Room EN 716.

INSTRUCTOR OF RECORD: Dr. X. Rong Li

E-mail: xli@uno.edu **Phone:** (504) 280-7416

Office: EN 852

Office Hours: Wednesday 3:45 to 4:45 PM

GRADUATE ASSISTANT: Ms. Samin Rastgoufard (srastgou@my.uno.edu)

LAB LOGISTICS:

Students shall form teams of at most 2 people. Each team will work at a different workstation. For each lab assignment, only one set of collected data and one written report is required of each team. Each team member must participate in each experiment and report preparation.

STUDENT LEARNING OBJECTIVES:

After successfully completing this course each student will be able to:

1. Properly use electronic instrumentation and measurement devices
2. Be familiar with fundamental electrical components and circuit construction techniques
3. Understand, through experiments, the practical principles of basic circuit laws (Ohm's law and Kirchhoff's laws), basic analysis techniques (nodal and mesh analyses), and circuit theorems (Thevenin's, Norton's, Maximum Power Transfer)
4. Construct variable frequency circuits
5. Construct circuits with operational amplifiers
6. Be familiar with electric machines

COURSE TOPICS:

1. Resistive Circuits
2. Thevenin and Norton Equivalent Circuits
3. Verification of Basic Circuit Analysis Methods
4. Maximum Power Transfer Theorem
5. Use of an Oscilloscope
6. Variable-Frequency Circuits – Low Pass Filters
7. Variable-Frequency Circuits – High Pass Filters
8. Operational Amplifier Circuits
9. Digital Logic Circuits
10. Electric machines

TENTATIVE WEEKLY SCHEDULE:

Week 1 (August 24):	Introduction to ENEE 3518 and safety Lab #1 – Measuring Resistance
Week 2:	Lab #2 – Equivalent Circuits
Week 3:	Lab #3 – Verification of Basic Circuit Analysis Methods
Week 4:	Lab #4 – Maximum Power Transfer Theorem
Week 5:	Lab #5 – Use of an Oscilloscope
Week 6:	Lab #6 – Variable-Frequency Circuits – Low Pass Filters
Week 7:	Lab #7 – Variable-Frequency Circuits – High Pass Filters
Week 8:	Lab #8 – Operational Amplifier Circuits
Week 9:	Lab #9 – Digital Logic Circuits
Week 10:	Lab #10 – Electric Machines (Room EN 611)
Week 11:	Lab #10 – Electric Machines (Room EN 611)
Week 12:	Review
Week 13:	Makeup Session (if needed)
Week 14:	Final Exam

COMPUTER USAGE: Use of Microsoft Office suite to produce typed report and plots is required.

SUPPLEMENTARY MATERIALS: Will be given in class or posted on Moodle.

GRADING POLICY:

- (1) Ten Lab Reports (50%)
- (2) Lab Participation (30%)
- (3) Final Exam (20%)

Lab assignments will be graded on student attendance, participation in the experiment, data collected, and detailed written reports.

Letter grades will be assigned according to the guidelines:

A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: <60

LAB REPORTS: A detailed written report is required for each lab assignment to develop the student's ability to communicate effectively in writing. Unless otherwise stated, the report must be turned in for each lab experiment at the beginning of the next lab. The report must include the following sections:

1. Cover page:
List course number, lab number, lab title, team members' names, due date, and instructor's name.
2. Table of Contents:
List sections in the report with the corresponding page numbers.
3. Abstract/Objective:
Briefly describe each experiment and summarize how results you obtained satisfy the goal of the experiment.
4. Equipment:
List the equipment and/or software you used to conduct the experiment.
5. Introduction/Theory:
Explain your approach to conducting the experiment and explain the underlying theory with equations and diagrams. Also show the calculations of expected results, when applicable.
6. Procedure, Measured Data, Calculations, and Results:
 - Clearly present the measured data for the experiment, and discuss the procedure and steps that were followed in the lab to obtain this data.
 - Show any calculations required to turn constants and measurement data into the final experimental results. Also show any calculations required to obtain theoretical results and any error analysis that may explain the difference between experiment and theory.
 - Use tables and/or plots wherever possible to organize and more clearly present the data and results.
 - This section may be broken up into multiple subsections if this makes the report easier to understand.
7. Discussion/Conclusion:
 - Answer all questions included in the lab document.
 - Discuss any problems you encountered in the experiment and how they were resolved.
 - Compare the experimental results you obtained with those expected from theoretical calculations, and comment on possible reasons for differences between the two.
 - Discuss the final results of the experiment and what insight you gained from that experiment.
 - Feel free to comment on how the experiment or its procedure can be improved to enhance the learning experience of future students who take this lab.

8. Appendices: Other supporting materials such as data sheets.

Lab reports will be graded based on the following criteria: proper sections, neatness, correct English, clear presentation and explanation of data and results, correct answering of questions, sensible discussions and conclusions.

ATTENDANCE: Attendance is required for lab duration.

MAKEUP POLICY: No makeup will be given for missed labs without valid and excuses. The instructor will make decisions regarding the makeup in the case of a valid and document-supported excuse.

LAB ETTIQUETTE: No foods or drinks are allowed. Respect others by keeping the noise level down.

Academic Integrity

Academic integrity is fundamental to the process of learning and evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the Student Code of Conduct for further information. The Code is available online at <http://www.studentaffairs.uno.edu>.

Accommodations for Students with Disabilities

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities should contact the Office of Disability Services as well as their instructors to discuss their individual needs for accommodations. For more information, please go to <http://www.ods.uno.edu>.

RELATIONSHIP OF THE COURSE TO PROGRAM OUTCOMES

X	a. an ability to apply knowledge of mathematics, science, and engineering	X	g. ability to communicate effectively
X	b. an ability to design and conduct experiments, analyze and interpret data		h. understand the impact of engineering solutions in a global and societal context
X	c. ability to design a system, component, or process to meet desired needs		i. recognition of the need for, and ability to engage in life-long learning
	d. ability to function on multi-disciplinary teams		j. knowledge of contemporary issues
X	e. ability to identify, formulate, and solve engineering problems	X	k. ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
	f. understanding of professional and ethical responsibility		