

EE 330L Energy Systems Laboratory, (3-1) 4 credits, SDSM&T, Spring 2012

Laboratory Room & Day: Meet in EP341 on Tuesdays (as announced in class).

Laboratory Times: Section -51 meets from 9-10:50am, section meets -52 from 12-1:50pm, and section -53 meets from 2-3:50pm

Instructor: Dr. Thomas Montoya, EP325, Tel: 394-2459, e-mail: Thomas.Montoya@sdsmt.edu

Office Hours: 3-4 pm MWF, or by appointment.

WWW: See link from <http://montoya.sdsmt.edu>. The course web page will be heavily utilized for posting assignments, examples, solutions, ... E-mail will be utilized to notify students of course-related information and events (**check daily**). Your first.last@Mines.sdsmt.edu address will be used.

Catalog Description: Production, transmission, and utilization of energy in systems with major electrical subsystems, with particular emphasis on electromagnetic and electromechanical systems and devices.

Prerequisites: EE 221 Circuits II

Text: S. J. Chapman, *Electric Machinery Fundamentals*, 5th Edition, McGraw-Hill Higher Education, 2012, ISBN 978-0-07-352954-7.

Lab Policies:

- Attendance is **required**. All laboratories must be completed by **every individual** at a passing level to pass the class. If you miss a laboratory, contact instructor to arrange to make up the work.
- Missing or failing to complete a laboratory during the scheduled periods for other than **verified** situations (e.g., Doctor's letter, jury duty) or sanctioned school events will incur a **10% penalty**.
- Late laboratory assignments will incur up to a 20% per week penalty (see above).
- Teams of up to three students will be allowed due to limited space and equipment.
- Each team will keep and use a bound laboratory logbook for all in laboratory work. **NO** spiral bound notebooks. Individuals are encouraged to keep their own logbooks.
- In this course, safety is a big issue. You will, perhaps for the first time, be exposed to currents and voltages capable of inflicting severe harm (potentially fatal). Deliberate, repeated, and/or irresponsible violations of safety measures/policies by individuals/teams will result in expulsion from lab and a grade of zero for all associated work (see first lab policy). A *ECE Department General Laboratory Safety Policy* document, posted on course web page, provides guidance.
- Students are encouraged to discuss lab assignments with team and can discuss lab in general terms with other teams. However, copying, plagiarism, ... (without proper referencing) of other teams is not acceptable and will be penalized.
- Complete preliminary laboratory work in your logbook **prior** to the scheduled laboratory session.
- Get professor or TA (teaching assistant) to initial your logbook both after the preliminary section (i.e., at the beginning of the lab period) and after the experimental section. This allows us to check your values and spot any problems early, when you can still fix them.
- Laboratory reports are to be typed in Times New Roman or Arial/Helvetica fonts, 11pt or 12 pt, 1.25 or 1.5 line spacing. Pages should be numbered at the bottom of the pages.

Laboratory logbook guidelines (See Figure 1 for some page examples.)

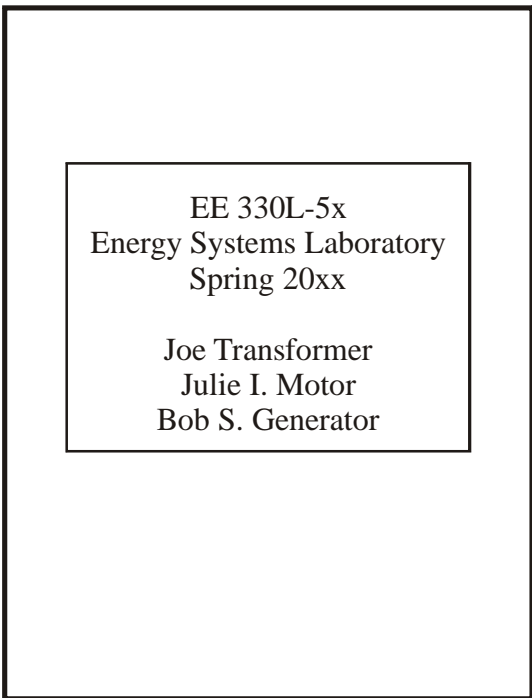
- a) All entries should be in ink (black and blue preferred) on fronts of pages only.
- b) On cover, put **EE 330L-xx** (appropriate section #), **Spring 2012**, and **your name(s)**. Also, it is a good idea to put contact information on or inside the front cover in case the logbook is misplaced.
- c) Make a **Table of Contents** (TOC) on the first page including the lab number, title, date(s), and page numbers (both start-finish).
- d) After the TOC, insert the *ECE Department General Laboratory Safety Policy*. Attach one sheet per logbook page. After reading, each team member should initial each page to indicate their acceptance and understanding.
- e) All pages should be consecutively numbered in top right hand corner.
- f) Start each lab by attaching the lab assignment sheet in the logbook. Next, do all the preliminary work (in the logbook!). In experimental portion of laboratory, **lab partner(s)**, **equipment list** (description, brand, & model #s), time & date ... should be listed, as applicable. Also, circuit(s) & test instrument(s) being used for measurements should be drawn/specified.
- g) Goal- another person should be able to duplicate lab work without outside references.
- h) Writing/figures/graphs must be legible and of a readable size- if we cannot read your work, you will not receive credit. As applicable, they should be titled, labeled (i.e., names / units on axes), scaled (i.e., numbers on axes), and clearly drawn.
- i) Figures, graphs, printouts ... can be attached/pasted into logbook. The bottom of a figure/graph should be oriented toward the bottom or right hand side of the page.
- j) Answers should be boxed/double underlined, in decimal format (if numbers), and the variables, values & units (if any) included. Use lead zeros for fractional answers, e.g., 0.4 not “.4”.
- k) Where applicable, use conventional engineering units such as microfarads, volts, milliseconds, Watts, ... Answers without applicable units are incomplete.
- l) Logbooks are not supposed to be a mystery, just ask if you have questions.

Assignments: The laboratory assignments will be posted on the course web page (follow link(s) from <http://montoya.sdsmt.edu>). See attached table for tentative schedule of labs.

Grading: The lab grades will be based on a combination of logbooks and/or reports. Expect to turn-in logbooks with reports.

Tentative Lab Schedule (subject to change)

Lab	Date(s)	Topics
0	1/24	Lab overview & introduction/review of use of logbooks
1	1/31	Three-Phase Loads
2	2/14	Single-Phase Transformer
3	2/28	Three-Phase Transformers
4	3/20	Synchronous Generator
5	4/3	Three-Phase Induction Motor
6	4/24	DC Machines



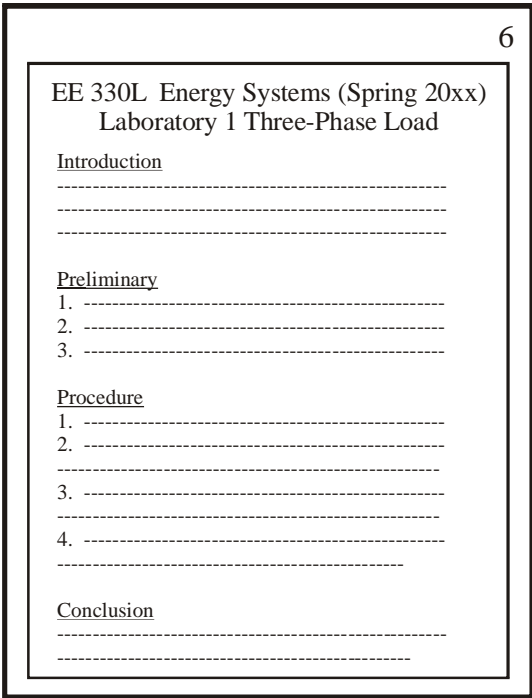
Cover

i

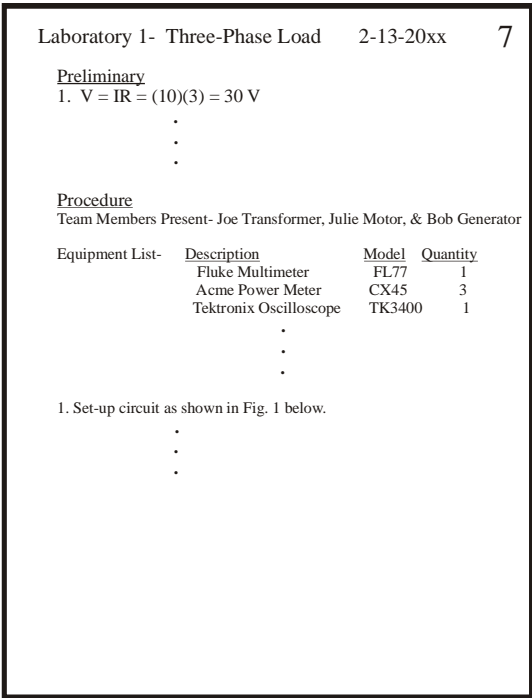
Table of Contents

<u>Lab #</u>	<u>Description/Title</u>	<u>Date(s)</u>	<u>Pages</u>
0	Lab Safety	1-28-yy	1-5
1	Three-Phase Load	2-13-yy 2-14-yy	6-7 8-14
2	Single-phase Transformer	2-13-yy	15-16
	•		
	•		
	•		

First sheet in logbook



Sample of lab cover page



Sample of lab work

Figure 1 Examples of laboratory logbook pages