

EE 252 Digital Electronics Lab Spring 2015

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Office Hours: TBD

Section: 001 T 1700-1950
Location: ESB 953

1. **Course Material:** Laboratory handouts posted on Ecampus
2. **Corequisites:** EE 251
3. **Learning Outcomes:**
 - a. Be familiar with laboratory equipment (digital multimeter, digital oscilloscope, function generator, DC power supply, and curve tracer).
 - b. Be able to design and conduct engineering experiments, to test theory, verify performance or find faults, to troubleshoot a system using good techniques.
 - c. Be able to analyze and interpret engineering data from experiments and simulations.
 - d. Develop circuit models of devices from data taken on a curve tracer and manufacturer data sheets, and use them to design circuits.
 - e. Analyze RTL, TTL, CMOS, and Bi-CMOS digital gates to determine terminal specifications.
 - f. Be able to communicate laboratory results through acceptable, written laboratory reports.
 - g. Be able to work effectively with a laboratory partner.
4. **Required Materials:**
 - a. **Lab Kit:** Each student is expected to bring an Electrical Engineering Laboratory Kit to lab each week. In addition, each student must bring a laboratory notebook to lab each week. Most electronic components needed for the lab will be provided.
 - b. The laboratory exercise descriptions can be found on the web page for the course. These exercises will be rewritten as the course proceeds. There will be several required exercises and students are expected to complete all the experiments assigned by the course instructors.
 - c. **Reference Materials:** A variety of references will be used. Device data must be obtained by researching the appropriate components datasheets.
5. **Attendance:**

You are expected to attend every laboratory session. Attendance will be taken and will reflect on your final grade. The decision to allow a make up lab will be at the discretion of the instructor. Appeals to this decision should be directed to the Associate Dean of Academic Affairs.

6. Lab Reports and Portfolio:

- a. The goal of this report is to clearly describe the **ENTIRE** process that took place in lab, including all design decisions. The report should describe **HOW** and **WHY** things were done, and provide an **ANALYSIS** of the results. Reports that simply state what was done without including how and why will not be accepted.
- b. Lab reports for each experiment are due at the **beginning** of the lab session for the following experiment. Multi-part labs will be discussed during the lab session as to their due date.
- c. *Late* reports will be assessed a **10% reduction** in score each late day. Reports submitted *more than 1(one) week* after the due date *will not* be accepted.
- d. Lab reports must be word-processed and presented in a professional manner. Each group is to submit **one report per member**. If a group has 3 members, that means 3 reports, one report from each member of the group.
 - i. Group members may use the same experimental data that was gathered for a particular lab, but each member must write their lab report in their own words. Identical submissions will result in a zero for the lab for the parties that turn in the identical documents.
 - ii. Members of the same group may share the results but the remaining material (theory, inferences etc.) must be your own.
- e. The report requires considerable thought to present the information in a logical and concise manner. The “experiment” and “results” section should be based on individual parts of the lab.

7. Laboratory Report Format

- a. **Title Page:** The title page should include your name, section, experiment number and title, lab partner, and the date the lab was performed.
- b. **Introduction:** The introduction section is a brief overview of the lab and should not be written in great detail. What is the problem you are trying to solve and why? What useful information should this experiment provide?
- c. **Experiment:** Under the experiment heading you should state what you are trying to accomplish on a particular part of the lab and **HOW** you accomplished it. What methods/techniques and theory did you use? Design work should go in this section. This should include **schematics**, truth tables, **equations**, flow charts, state diagrams, **components** (transistors, resistors, diodes), listings, pictures of functioning devices, or anything else you used in designing or setting up your experiment.
- d. **Results:** The result section should contain the results (data) that you obtained from implementing the experiment as well as an analysis of the results. The results could be measured results from a multi-meter, or it could be a description of what worked, what didn't work, and why it worked / didn't work. What distinguishes the “Experiment” section from the “Results” section is the “Results” section shows the measured experimental data, while the “Experiment” section should represent the theoretical/expected data.
- e. **Conclusion:** The conclusion should state what was learned from the lab experiment and what you thought about it.
- f. **Note: Failure to adhere to this format results in deduction of marks.**

8. Lab Portfolio:

- a. Each student is required to keep his/her own lab Portfolio at the end of the semester. The portfolio must be organized in a 3-ring binder with major sections as follows
 - i. Table of Contents with student information
 - ii. One page summary of what was learned in the Laboratory
 - iii. Syllabus
 - iv. Lab 1
 1. Lab Handout
 2. Lab Notes
 3. Lab Report
 - v. Lab 2, etc
 1. Lab Handout
 2. Lab Notes
 3. Lab Report
- b. All pages must be numbered (with ink).
- c. A table of contents should be included on the first page of the portfolio. It should list the title of the lab and the page numbers it covers along with the student name and lab section
- d. All lab handouts, notes, procedures, experimental data, calculations, design ideas etc should be kept in the lab portfolio.
- e. Attachments (if any), should be fastened permanently into the notebook.
- f. All entries should be made in ink, and mistakes should be crossed out with a single line, not erased or heavily marked out.
- g. The portfolio should be a chronological order of all work done.

9. Grading Policy:

Lab Reports: 30%
Final Design Project: 30%
Lab portfolio: 20%
Attendance: 10%
Peer Review: 10%

10. Grade Assignment:

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

11. Social Justice and Disability Statement:

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Accessibility Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see <http://diversity.wvu.edu>.

12. Academic Integrity:

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Catalog at <http://catalog.wvu.edu/undergraduate/coursecredittermsclassification/#academicintegritytext>. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

13. Days of Special Concern:

WVU recognizes the diversity of its students and the needs of those who wish to be absent from class to participate in Days of Special Concern, which are listed in the Schedule of Courses. Students should notify their instructors *by the end of the second week of classes* regarding Day of Special Concern that will affect their attendance. Students must abide by the attendance policy of their instructors on their syllabi. Faculty will make reasonable accommodation for work that a student misses as a result of observing a Day of Special Concern.