

This is a web based syllabus and is best viewed/utilized on-line

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Course Description: Includes Ohm’s Law, Kirchhoff’s Voltage and Current Law, Superposition, Thevenin’s Theorem, and R-C circuits. Labs include basic measurement techniques, use of electronic test equipment and proper documentation procedures.

Credits: 4

Text Book: Electronics Fundamentals by Floyd, eighth edition, Prentice Hall.

Prerequisites: Placement into or completion of MTH 95 and WR 121.

Required equipment: calculator such as the TI-85, solderless breadboard/protoboard, lab notebook

Course Objectives:

- Construct, analyze and troubleshoot DC circuits.
- Operate electronic test equipment: multimeter, power supply, function generator, oscilloscope.
- Use electronic circuit simulation software like PSpice
- Communicate technical information in written and oral form
- Practice safe operating procedures.

Instructional Program:

- 3 hour lecture and 3 hour lab will be offered every week
- Each of the theoretical concepts presented in the lecture will be demonstrated in the lab through lab experiments
- Homework problems will be assigned weekly, and they will be presented and discussed by the students in class in the next meeting.
- There will be a quiz each week focusing on the previous week’s material.
- A cumulative final will be given.
- In the lab, all the measurements will be recorded in a lab note book –they must be orderly and complete and will be evaluated on that basis
- One lab experiment will require a formal lab report
- A laboratory practical examination will be given during the last lab period.

Grading:

Quiz/Homework/Participation	50%	90 – 100% of total points	A
Final Exam	20%	80 – 90% of total points	B
Laboratory grade	30%	65 – 80% of total points	C
		55 – 65% of total points	D
		< 55% of total points	F

Tentative Schedule:

Wk	Topic	Lab	HW	Read Ahead
1	The International System of Units; Matter, Electricity, Resistance, Measuring Voltage, Current and Resistance.	1	1(1, 2, 6, 8-9, 18-28) 2(1, 2, 7-8, 13-15, 17-18, 25, 27-30, 39-40)	1, 2, 3
2	Ohm’s Law; Power and Energy in the Electric Circuits; Open and Short Circuits.	2	3(5, 11, 15, 21, 29, 31, 33, 39, 41-42, 50-51, 53, 55, 57, 65)	4
3	Kirchhoff’s Voltage Law; Double Subscript Notation; Analysis of Series Circuits.	3	4(TS1-5, 3-6, 10-11, 13, 15-16, 19-23, 26-27, 37, 39-41, 47, 49)	5.1-5.7
4	Kirchhoff’s Current Law; Analysis of Parallel Circuit	4	5(TS1-5, 1, 3-5, 8, 10, 13-17, 21, 25-29, 31, 32, 39)	6.1-6.4
5	Analysis of Series-Parallel circuits.	4	6(1-20, 47, 58)	6.1-6.4
6	Analysis of Series-Parallel circuits.	5	6(TS1-5, 35-37, 40, 42-46, 54, 63)	6.5-6.7
7	Thevenin Theorem, Maximum Power Transfer	6	6(23-32, 42c-d (use Thevenin), 53)	6.8-6.9
8	Superposition Theorem	7	6(33-34, 51, 52)	9.1-9.5, 9.7
9	Capacitance and Capacitors; Analysis of R-C Circuits.	8	9(1-4, 19, 22-28, 41-43, 45)	
10	Review, and Laboratory Practical Examination			
11	FINAL EXAMINATION – cumulative			

No class on the following dates: 1/18

Important:

- No phones or pagers in the lecture, not even in vibrate mode
- Attendance: counts as participation. Please see me regarding any class you must miss. You are responsible for all material presented in class.
- The classroom is open – come and go, as you need.
- Exams and homework can only be made up by prearrangement
- Tests/quizzes are close book, one **hand written** crib sheet (8.5”x11”) allowed, both sides
- Assignment/exam calendars may be changed in response to the weather or institutional problems.
- If you have an accommodation form from [Disability Services \(DAS\)](http://www.pcc.edu/resources/disability) [www.pcc.edu/resources/disability], please make arrangements to meet with me privately at the beginning of the term to discuss your needs.
- Grades are assigned based on the [PCC grading policy](http://www.pcc.edu/resources/academic/standardspractices/AcademicStandardsandPractices-GradingGuidelines.html) [http://www.pcc.edu/resources/academic/standardspractices/AcademicStandardsandPractices-GradingGuidelines.html]. Students should be aware of the grading options and the associated deadlines.
- Academic Integrity: Submitting work copied from other sources is a violation of PCC’s [Academic Integrity policy](http://www.pcc.edu/about/policy/student-rights/documents/academic-integrity.pdf)[http://www.pcc.edu/about/policy/student-rights/documents/academic-integrity.pdf]. All work submitted (homework, lab reports) should be the student's original work. Any assignment in violation will receive a zero.

LAB-SECTION

Introduction

The laboratory portion of MT 111 has a number of important functions. It teaches a student how to use several different instruments and how to make a variety of measurements. The following laboratory techniques are emphasized:

- 1) Accurate and neat wiring layout
- 2) Correct measurement procedures
- 3) Proper methods for recording data
- 4) Proper methods for presenting data and reporting results
- 5) Correct usage of PSpice simulation program
- 6) Team work

Safety

All the instruments in the lab are Safety class I, which means that they are provided with a protective earth terminal. This terminal is connected to an ac source that has a 3-wire ground receptacle. Always use safe techniques:

- 1) Turn the power off before you work on a circuit.
- 2) Remove rings, watches, and any metal objects that might touch a part of an energized circuit.
- 3) Do not stand on wet surfaces or work with wet hands when working with an energized circuit.
- 4) Do not touch metal parts of two test instruments at the same time
- 5) Know the location of any safety devices such as circuit breakers and fire extinguishers.
- 6) Make sure you know where the telephone is in the room.

Cleaning Up

At the end of each lab period you are responsible for straightening up your lab station. Make sure that all the equipment is turned off, loose papers are removed or recycled, disposable items (loose wires, paper clips, etc.) are disposed of.

Grading

Your grade will be determined as follows:

- | | |
|-----------------------|-----|
| 1) Lab activity | 5% |
| 2) Lab notebook | 10% |
| 3) Lab Report | 5% |
| 4) Lab Practical Exam | 10% |

The laboratory work grade will represent 30% of the final grade for the MT 111 course.

Lab Procedures:

The materials required for the lab are:

1. your breadboard
2. your parts bag
3. your lab notebook
4. the lab handouts from myPCC

Laboratory activities must be recorded in a notebook. The notebook must be permanently bound. It must be orderly and complete and will be evaluated on that basis. Data from the experiment is recorded directly into the notebook. All entries should be in ink. Corrections are done by neatly crossing out the error, adding a note when and why the change was made.

To emphasis: your lab notebook is not meant to look like a nice neat formal lab report. It is a record of your activities. Material should be entered in the order it is done, which may mean some activities will be broken up. This is ok, just reference previous entries.

If a computer printout or other addendum is specifically required to be attached to your notebook, it must be thoroughly taped or glued securely in the book.

The laboratory notebook is a record of what you did in the laboratory. The significance of any measurement, calculation or observation, which you make during the course of experiment, might not be apparent to you until the entire experiment is over. Therefore, the lab notebook should contain a record of everything you did in the lab. **A reader should be able to follow your procedures and notes, to reproduce your results and conclusions.**

Each experiment must include the following:

- 1) The experiment title, the day when you completed it.
- 2) Schematics or drawings that illustrate the circuits connected and used.
- 3) Data tables with experimental results.
- 4) Graphs, curves or additional tables that might be needed.
- 5) Explanations of all schematics, tables, graphs and calculations
- 6) Observations and Conclusions.

Notebooks will be collected at the end of lab and will be available at the next lecture. You are responsible for bringing your notebook to lab. **You cannot complete a lab without your notebook.** You may leave them with me if you prefer.

In addition, you will also write a formal lab report. The lab will be determined during the semester. The report is worth 5 points, and will be due one week after the lab experiment has been done. Grading will be based on presentation, clarity, completeness and technical correctness.

Lab Practical Exam

A practical examination will be given during the last lab period. Individually you will perform an experiment similar to the lab modules done during the term. You will be required to demonstrate the ability to use the meters and power supplies, build circuits on the breadboard, and calculate and measure various parameters for the circuit. The lab practical is worth 10 points