PHYS 221: Linear Electronics
Spring 2016

Teacher: Dr. Kelly Krieble Office: Room 109, Collier Hall of Science Phone: ext. 1437 e-mail: krieblek@moravian.edu	Classroom: CHS 108 M,W,F 8:55-9:45am Lab: CHS 108 M, W 1:15-4:15pm Office Hours: MWF 8-9am

Goals of the course:

The primary aim of this course is to provide students with a working knowledge of the concepts of analog circuitry, both D.C. and A.C. Students will be able to analyze existing circuits as to their function, design simple interfacing systems using integrated circuits, simulate circuit systems using MultiSym circuit simulation software, and program in LabView. Extensive use will be made of the electronics laboratory, as this course meets twice a week for lab.

Course Texts: Introductory Electronics for Scientists and Engineers, 2nd ed., Simpson.
30 Arduino Projects for the Evil Genius, Monk

Course Content and Schedule of Topics:

Topic	*Approximate Time Span*	*Readings*
Course introduction and review of Physics 111-112	1 day	PHYS112 notes
1. D.C. Circuits a. Ohm's Law b. Current, Resistance, Voltage c. Kirchhoff's Laws d. Thevenin and Norton's Theorems	2 weeks	Chapter 1
2. A.C. Circuits a. Complex Analysis b. Impedance c. Resonance and Oscillators	2 weeks	Chapter 2
3. Fourier Analysis a. Filters b. FFT	1 week	Chapter 3
4. Semiconductors Devices a. Diodes b. Transistors	3 weeks	Chapters 4-6
5. Feedback and Op-Amps a. Integrators, Differentiators b. Multipliers c. Analog Computers d. Instrumentation Op-Amp	5 weeks	Chapters 7-10
6. Power Supplies a. Regulators b. Transformers	3 weeks	Chapter 11

Grading Policy:

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

Assessment:	**% Weight**
Homework Problems	10
Labs	30
Project	10
Exams	30
Final Exam	20

Homework Problems:

While the homework problems do not constitute a major portion of your grade, they are designed to assist in your understanding of the material presented in class and lab. Your work on these problem sets will be bound by the Moravian College Policy on Academic Honesty in the Student Handbook. The due dates for each assignment will be stated when the assignment is handed out. There will be a 50% deduction for tardy work up until solutions to the homework are posted in the periodical room (CHS 117). Work submitted after that time will receive a zero.

Labs:

We will meet twice every week for lab, and you will be expected to keep an ongoing lab workbook/portfolio of your work. Lab write-ups will NOT be collected every week for each lab, however your instructor will periodically check your progress throughout the semester with scheduled lab notebook checks/evaluations, so it will be imperative that you keep your lab notebook as up-to-date as possible. Your instructor will brief the entire class on the weekly lab that you will perform during the lab period but you may work on it at your leisure at other times, as the lab will be open and available for your use. In addition, the lab period may also be used to review material or to take exams, so attendance is mandatory.

Project:

This semester-long project will involve developing a program and associated electronics incorporating the Arduino microcontroller.

Exams:

Approximately every three to four weeks an exam will be given during the laboratory period.

Final comprehensive exam:

An exam on all material covered during the semester.

Attendance Policy:

Students are expected to come to class. To that end, I WILL take attendance, and reserve the right to raise/lower your grade based on your attendance.

Statement on disability:

Students who wish to request accommodations in this class for a disability should contact the Academic Support Center, located in the lower level of Monocacy Hall, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

The Writing Center is located in a building that is not accessible to persons with mobility impairments. If you need the services of the Writing Center, please call 610-861-1392.

Good luck in the coming year. Should you have any comments about the class during the semester, please feel free to discuss them with me - I will welcome any suggestions for improving the course. Since I am looking for you to do your best work, you should demand excellence from me as well.

Subject to revision