UMCP PHYS 485 and 685 Syllabus Fall 2015

Professor
Daniel P. Lathrop
Office: 3319 A.V. Williams
Office Hours: Right after class or by appointment
Telephone: 301-405-1594
E-Mail: Is not the best way to contact me. In person at class or just after class is more effective. lathrop@umd.edu

Teaching Assistant
Ruben Rojas
Office Hours: TBD, but you will see him in the lab!
E-Mail: rrojasg@umd.edu

Course Emphasis
Physics 485/685 are courses in modern electronics with an emphasis on hands-on laboratory work and topics that are useful as career skills.
Lecture meets Monday and Friday 2-2:50 p.m. in Room PHYS 0405.
There is one laboratory section each week on Wednesday in Room PHYS 3321 nominally from 1-4:50 p.m. A student ID card swipe is necessary for access to the laboratory area.

Textbooks/Manuals
Required

Recommended references
2) CMOS Cookbook, D. Lancaster, Howard W. Sams and Co., 1997
3) Lancaster’s Active Filter Cookbook, D. Lancaster, Butterworth-Heinemann, 1996.

Laboratory Notebooks
Each student should obtain a bound laboratory notebook in which all data and descriptive information about each experiment is to be recorded in pen not pencil. The laboratory notebook should have a table of contents on the first page (added to over time) to aid in locating the different experiments. It should be possible to reconstruct the experiment from the information in the laboratory notebook. Errors should be crossed out with a single line rather than erased or obliterated. Often an incorrect calculation or circuit will contain information that
is useful later on. The laboratory experiments for Wednesday will routinely be discussed in class on Monday, and it is recommended that the laboratory notebook be brought to lecture. The laboratory experiments are flexible by design allowing students latitude in pursuing individual interests. Descriptions of the experiments are given in the Laboratory Manual along with data sheets for the devices used in the experiments. Operation manuals for all the laboratory equipment are available in the laboratory.

**PHYS 485/685 Laboratory Reports**
Format will be discussed in lecture.

**Grades**
The semester grade for the course will be determined in the following way:

**PHYS 485**
- Lab reports: 60%
- Participation in lecture: 10%
- Homework: 15%
- Project: 15%

**PHYS 685**
- Lab reports: 55%
- Participation in lecture: 10%
- Homework: 10%
- Project (by design more advanced): 15%
- Linkedin page content: 10%

**PRELIMINARY LECTURE SCHEDULE**

**PHYS 485/685 tentative schedule**

**Week**
- 31-Aug  Overview / passives
- 7-Sep  Passives and how LRC permeates all physical systems
- 14-Sep  Diodes
- 21-Sep  Transistors
- 28-Sep  FETS, MOSFETS, IGBTs
- 5-Oct  Op amps
- 12-Oct  Soldering, smoke and mirrors, how things fail (when the smoke comes out)
- 19-Oct  Houston we have a problem (debugging strategies)
- 26-Oct  Grounds
- 2-Nov  Discrete logic
- 9-Nov  Arduino
- 16-Nov  Sensors, temperature, magnetic field
- 23-Nov  Sensors and photonics, optical, particle
- 30-Nov  Actuators, solenoids, motors
- 7-Dec  Actuators, Magnetic, pneumatic
- 14-Dec  No Final