

# PHY270: Electronics and Instrumentation I

Gustavus Adolphus College Spring 2009

**Instructor:** Dr. Thomas Huber

**Office:** Olin Hall 209

**Phone/Voicemail:** 933-7036

**Email:** [huber@gustavus.edu](mailto:huber@gustavus.edu)

## **Textbooks:**

Electrical Engineering: Principles and Applications (4th Ed.) by Allan Hambley (Prentice-Hall, 2008)

Electronics and Instrumentation I Lab Manual by Dennis Henry and Tom Huber (2009)

## **References:**

Electronics (2nd Ed.) by Allan Hambley (Prentice-Hall, 2000)

The Art of Electronics (Second Ed.) by Horowitz and Hill (Cambridge, 1989)

Analog and Digital Electronics for Scientific Applications (2 Vols.) by Dennis Barnaal (Waveland, 1989)

Introductory Electronics for Scientists and Engineers (2nd Ed.) by Robert Simpson (Allyn & Bacon, 1987)

Electronics: A Systems Approach (2nd Ed.) by Neil Storey (Addison-Wesley, 1998)

D.C. Henry Resource Letter TE-1 Teaching Electronics, Am. J. Phys January, 2002

## **Course Policy and Evaluation:**

1. **Class Meetings and Reading Assignments:** The class will meet four days a week (MTWF) for lecture, recitation or homework review. Students must also be co-registered for PHY-271, Electronics and Instrumentation I Lab. When reading assignments are made for a class session, the **reading is expected to be completed before coming to the class.**
2. **Homework:** Written homework problems will be assigned roughly once per week. Problems will be graded and returned to the student. Late homework *may* be accepted at the discretion of the instructor, with possible loss of points.
3. **Group and Discussion Problems:** Roughly once per week, there will be group problems and/or discussion problems. For discussion problems, a collection of problems will be assigned, and students will be asked to present the solutions to the class.
4. **Attendance:** Regular attendance at all class meetings is expected. Students will be held responsible for informing themselves of all announcements/assignments made in class.
5. **Exams:** There will be four one-hour exams and a two-hour final exam. The date for each of the exams is given below. Students must arrange **in advance** to take an exam at other than the scheduled time, and may do so **only** for a valid health or school-related reason.
6. **Academic Honesty:** Having signed and agreed to abide by the College's Honor Code, students thereby pledge that, in all academic exercises, examinations, papers, and reports, they shall submit their own work. Footnotes, or some other acceptable form of citation must accompany any use of another's words or ideas. In the context of this course, students are expected to collaborate and to discuss their out-of-class assignments. However, submitting under one's own name work that is merely copied from another is a violation of the Honor Code. (The full text of the Gustavus Academic Honor Code Policy may be found in the Gustavus Academic Bulletin).

7. **Incompletes** : A grade of incomplete will only be given for work not completed due to circumstances beyond the control of the student (**This is the college policy**).

8. <b>Evaluation</b> :	Homework & Group Problems	20%
	Hour Exams (four exams)	55%
	Final Exam	25%

Grades will be assigned using the following scale as a guide

94-100	A	74-78	C+
90-94	A-	70-74	C
86-90	B+	66-70	C-
82-86	B	62-66	D+
78-82	B-	58-62	D
		0-58	F

Assignment of the final letter grades will also take into account other factors including the instructor's subjective evaluation of the student's attendance, initiative, evidence of improvement, and the quality of independent work.

9. **Exam Schedule:**

Wednesday, March 4, 2009

Wednesday, April 1, 2009

Friday, April 24, 2009

Friday, May 14, 2009

Final Exam: Friday, May 22, 2008 at 8:00 AM

10. **Preliminary Course Content**

<b>Chapter</b>	<b>Topics</b>
1-2	DC Circuits, Kirchoff's Laws and Thevenin's Theorem Introduction to CircuitMaker software
4-6	AC Circuits
10	Diodes and Power Supplies (also Supplementary Readings pp. 161-174)
11	Amplifiers and Feedback (also Supplementary Readings pp. 556-581)
14	Operational Amplifiers
9.2	Signal Conditioning
9.3	Analog/Digital Conversion Comparators (Supplementary Readings pp. 800-809)
13-12	Transistors (bipolar first, then field-effect)
7	Digital Logic (static & sequential), (Supp. Readings pp. 809-821)