Physics 432  Digital Electronics,  Spring 2011

Instructor: Raymond Frey, Wil 405, 346-5873, rayfrey@uoregon.edu

Lectures: TuTh: 12:00-13:20, Wil 318  (the goal will be to keep the lectures to 50-60 minutes)

Labs: Wil 11 (basement); times tbd; there will be one 3-hour lab per week, starting the week of April 4

Office hours: 1:30-3:00, M-F  (please check for updates)


WWW: http://www.uoregon.edu/~rayfrey/432/ (this page)

Grading: homework (20%), labs (45%), mid-term exam (13%), final exam (22%)

TA: Erik Keever, ekeever1@uoregon.edu; office hours M,F noon-1:00, Wil 217

Other Resources: homework solutions | exam and practice exam solutions | lecture notes: Notes1

News/Announcements:

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<td>Mar 27</td>
<td>hello world</td>
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Lecture/Homework/Lab/Exam Schedule (to be updated continuously):

Solutions are available here: [homework](#) | [exams and practice exams](#)

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<tr>
<th>Week</th>
<th>Lecture Topic, notes</th>
<th>Lab</th>
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<td>Mar 28 - Apr 1</td>
<td>basic digital concepts; binary arithmetic; digital gates - Notes1</td>
<td>no lab</td>
<td>Text: 8.2,8.3,8.6,8.8,8.9,11</td>
<td>Tues Apr 5</td>
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<td>May 30 - Jun 5</td>
<td>Projects</td>
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Final exam Tue June 7, 08:00 (!)

Course Description:

This course emphasizes a practical "working" knowledge of digital electronics, suitable for experimental research in science.

We will cover the following topics:

- binary arithmetic and logic gates
- combinational logic
- flip-flops and sequential logic; counters and registers
- state machines/processors; memory; bus signals
- analog-to-digital (A/D) and D/A conversion

I will provide lecture notes which will be handed out in class and will be available from this web page. The course material follows from these notes. This material corresponds to Chapter 8, part of Chapter 9, and a touch of Chapter 11 of the text. We start with basic ideas, and by the end of the course we will understand the structure and function of simple processors/computers. The text is very comprehensive, but sometimes difficult to follow as an introduction to the subject. It is perhaps best to use it as a supplement and it makes an excellent reference, although some of the material is becoming outdated.

Digital electronics can be (mostly) understood at the introductory level without specific reference to analog electronics, calculus, or differential equations. We will occasionally need to make use of analog ideas such as RC time constants or RC frequency-domain filtering. Students can refer to Sections 2 and 3 of the Analog Notes from Phys 431.

The lab part of the course will comprise 5 set labs (handouts will be provided) and a project. The project will be worth ~1/3 of the lab grade and must be passed to pass the course. Here are project guidelines and some examples of past projects.

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