

**Tentative Syllabus for Physics 332**  
**Digital Logic and Circuitry**  
**Spring 2013**

**Catalog Description: Phys 332 - Digital Logic and Circuitry**

Four semester hours (3 lecture, 2 lab)

This course covers the fundamentals necessary to apply state-of-the-art digital components to practical problems in computing and scientific research. Components are constructed, operated, and tested in a laboratory environment. Typical topics covered are digital information and number systems, switching algebra and logic networks, flip-flops, registers, gates, arithmetic processors such as adders and counters.

- Texts:**
1. Digital Fundamentals  
by T. Floyd
  2. Digital Experiments - emphasizing systems and design  
by D. Buchla

**Instructor:** Charles Rogers      Office S-238 & Lab S-108      Phone 886-8654/5486  
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**Office Hours:** One half hour before and after all my classes and by appointment at other times. Typically, I am also available for help most afternoons and many evenings.

**Goals of the Course:** Students learn the principles and applications of digital electronics. The course also provides background for laboratory work in the sciences at the graduate level and/or the background required of managers in the technical industries. The laboratory instruction for this course includes circuit design and analysis using electronic instrumentation and interactive schematic capture and circuit simulation software. Laboratory reports are written describing the results obtain by the students.

**Topical Outline:**

<b><u>Week</u></b>	<b><u>Topic</u></b>
1	Introduction to digital electronics
2	Number systems, operations, and codes
3	Logic gates and integrated circuit logic families
4	Boolean algebra and logic simplification
5	Combinational logic
6	Timing and state diagrams & introduction to FPGAs
7	Computer tools -- logic simulation and QM logic simplification
8	Adders, comparators, encoders/decoders, and code conversion
9	Multiplexers/demultiplexers, and parity generators/checkers
10	Flip-flops, latches, one-shots, clock generators (including 555)
11	Counters
12	Shift Registers
13	Memory circuits
14	Programmable logic
15	Fundamentals of digital computers (includes a 3-bit machine)

**Grading Procedure and Scale:**

**Lab Grade:** The laboratory grade counts 25% of the total class grade. The lab grading procedure will be discussed in lab.

**Lecture Grade:** The lecture portion of the grade (i.e. 75%) is determined from homework, three hour exams, pop quizzes, and the final exam as outlined below.

- ∴ Homework, attendance, and pop quizzes            100 points
- ∴ Each hour exam –    100 points (total 300 points)
- ∴ Final exam (comprehensive)                            100 points

One exam grade can be dropped from consideration. Missing an exam without first making arrangements for make-up with the instructor (excused absence cleared before the exam) will automatically consume the dropped grade. Missing other class periods will result in penalties as described under the attendance section below.

**Course Grade:** The course grade is determined from the weighted average of the lecture and lab grades according to the schedule below.

90% and up	A
80% to 90%	B
60% to 80%	C
50% to 60%	D
less than 50%	F

**Attendance and Tardiness:** Students are expected to be on-time and present for all class meetings. Excused absences can be arranged prior to the class period being missed for appropriate activities as determined by the instructor. If an emergency results in an absence, the student should contact the instructor as soon as possible informing the instructor of the emergency and inquiring about ways to make up the missed class. The instructor will make judgments on how to handle the situation. Possible reasons for an excused absence are listed in the “ Student’s Guidebook” under class attendance policy. Attendance and tardy records will be maintained and both may result in deductions from your overall grade.

**Classroom Behavior:** Disorderly conduct which interferes with the normal classroom atmosphere will not be tolerated. The classroom instructor is the judge of such behavior and may instruct a disorderly student to leave the room with an unexcused absence or in more serious situations a student may be removed from the class with a failing grade.

**Cheating and other Breaches of Academic Conduct:** Academic cheating, plagiarism, and other forms of academic misconduct may result in removal of the student from class with a failing grade or may in extreme cases result in suspension or expulsion from the University as described in the “Code of Student Conduct” section of the “ Student’s Guidebook”.

**ADA Eligible Students:** ADA eligible students should make arrangements with the instructor in the first week of the semester about special arrangements needed for classroom or testing facilities and procedures to accommodate the disability.

**Evaluation of Instruction:** Students will be given opportunities to evaluate instruction near the end of the semester. If students have concerns about the classroom experience during the semester they should inform the instructor of those concerns and failing a satisfactory response may, as a last resort, contact the physics department head with those concerns.