

**ELEC 2200 - DIGITAL LOGIC CIRCUITS  
SUMMER SEMESTER - 2008**

2008 Catalog Data: ELEC 2200. DIGITAL LOGIC CIRCUITS (3). Prereq. COMP 1200 or COMP 1210. Electronic devices and digital circuits; binary numbers; Boolean algebra and switching functions; gates and flip-flops; combinational and sequential logic circuits; hierarchical design of digital systems; computer-aided design tools for digital design, simulation, and testing.

Textbook: *Digital Logic Circuit Analysis and Design*, V.P. Nelson, H.T. Nagle, B.D. Carroll & J.D. Irwin, Prentice-Hall, 1995.

Web Site: <http://www.eng.auburn.edu/~nelson/courses/elec2200>  
(Copies of assignments, supplementary documents, etc.)

Instructor: Victor P. Nelson, Professor of Electrical Engineering  
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Course Objectives:

1. To be able to analyze and design combinational logic circuits
2. To be able to analyze and design sequential logic circuits
3. To be able to develop and simulate gate-level models of digital logic circuits

Prerequisites by topic:

Introductory computer programming in a high level language (COMP 1200 or 1210 or equivalent)

Topics:	Textbook Sections:
1. Introduction to digital systems	0
2. Number systems and codes	1.1 - 1.4
3. Boolean and switching algebra	2.1
4. Switching functions and canonical forms	2.2
5. Design and analysis of combinational circuits	2.3,2.4,2.5,2.6
6. Circuit minimization via Karnaugh maps	3.1 - 3.5
7. Modular design, decoder/encoder modules, multiplexers/demultiplexers	4.1 - 4.5
8. Arithmetic circuits and ALUs	4.6 - 4.8
9. Latches and flip-flops	6.1 - 6.4
10. Counters and shift registers	7.1,7.3,7.4
11. Synchronous sequential circuit analysis	8.1, 8.2
12. Synchronous sequential circuit design	8.3, 8.4
13. Simulation and timing analysis of sequential circuits	8.5
14. Optimization of synchronous sequential circuits	9.1,9.2,9.3
15. Programmable logic devices	5, 11

**FINAL EXAM: Wednesday, August 6, 4:00-6:30 p.m.**

**COURSE GRADES WILL BE DETERMINED AS FOLLOWS:**

Homework	50 points
Hour exams (2 @ 100 points each)	200 points
Final exam	150 points
TOTAL:	400 points

**EXAMS:**

The two hour exams and the final exam will be closed book and closed notes. Make-up exams will be given only in the case of university-approved activities or documented emergencies.

## READING ASSIGNMENTS:

You are responsible for studying all textbook sections listed above, in addition to material presented in class.

## CLASS ATTENDANCE:

Regular, on-time class attendance is important because:

- your understanding of the material will be greater. You will receive a professionally prepared presentation on the subject, which frequently includes supplementary material not in the text.
- the course will be easier, and your grade will be higher.
- as an emerging professional, you incur professional and ethical responsibilities. Your primary mission at Auburn is to acquire a formal education. To that end, the single most important action you can take is to attend class.
- as a serious conscientious student, you owe a 3-credit course at least 9 hours of effort per week (13.5 hours on the summer schedule). The most efficient and constructive use of three hours of this time is to spend it in class.
- you are made aware of any administrative changes relating to the course.
- your absence creates problems for others. You don't pick up your work, you don't get copies of handouts, you are unaware of course administrative changes, etc. Late arrivals, or early departures are distractions to the class, and are rude and inconsiderate.

Therefore, your attendance record will be a factor in determining your course grade. Attendance will be recorded using a seating chart, with points assigned for absences and lateness, according to the following:

3 points: Unexcused absence

1 point: In attendance, but late or leaves early ("partial absence")

0 points: On time and in full attendance

**A total of 6-8 points will result in the final course grade being reduced by one letter grade.**  
**A total of 9-14 points will result in the final course grade being reduced by two letter grades.**  
**A total of 15 points or more will result in a final grade of "FA" (failure due to excessive absences.)**

**Class convenes promptly at 1:15 p.m. If you arrive after class convenes, you're late!** If you have an AU-approved written excuse for lateness, or absence, please submit that document, identifying the class involved, the particulars, your name, signature, and student number.

## HOMEWORK:

The key to learning any engineering concept is to study it and understand how to apply it to solve problems. The role of the course instructor is to assist you in this endeavor by explaining concepts in class and providing meaningful homework to help you study and learn them. The purpose of homework is:

1. to apply relevant engineering principles to specific applications, to improve mathematical, scientific, and analytical skills, and to identify technical points that need further clarification;
2. to improve communication skills, to develop technical writing skills, to improve computer usage and graphical display skills, and to clarify concepts; and
3. to encourage class participation and to promote class involvement, responsibility, and professionalism.

Each student is urged to develop his/her own solution to all homework problems. Collaboration and answer checking are acceptable; however, **each student must only submit his/her own work.** To submit the work of others is an academic honesty policy violation, which will be handled according to the procedures in the *Tiger Cub*. Late homework will be accepted only under extenuating circumstances and must be submitted using the procedure described above under class attendance. **Homework is late if it is submitted after class convenes (1:15 p.m.)!**

Homework submissions should adhere to the following format requirements. Use 8.5" x 11" paper; write on one side only; and staple all pages together (upper left hand corner). Label the outside of your assignment (top; folded edge to the left) as follows. (Please don't waste paper on a "cover page".)

<p><b>Your Name</b> <b>ELEC 2200, Assignment Number</b> <b>Date submitted (May 28, 2008)</b></p>
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Homework will be graded on both technical merit and format. Your presentation should be neat, easily legible, technically literate, technically correct, and well-organized.

**OFFICE HOURS:** You are encouraged to come by my office during posted hours to discuss problems or anything related to the course (or anything else that might be on your mind). This course builds on itself as it progresses, so it is important that you address and resolve problems as they arise, rather than waiting until the day before an exam.

**SPECIAL ACCOMODATIONS:** Students who need special accommodations are asked to see me the first week of the quarter. Bring your memo from *The Program for Students with Disabilities* to this meeting. Accommodations for each exam should be arranged one class period in advance.