EEL 3701C  Digital Logic and Computer Systems

1. Catalog Description – (4 credits) An overview of logic design, algorithms, computer organization and assembly language programming and computer engineering technology. Laboratory.

2. Pre-requisites– CIS 3020 or CGS 2425

3. Course Objectives - To learn to: perform elementary manipulations of Boolean algebraic equations; simplify logic expressions; design combinational and sequential circuits; use a digital design and simulation package, use a hardware description language (HDL), analyze binary storage device behavior and applications, and to study the fundamentals of microprocessor architecture, including assembly language programming and the design of basic components of a microprocessor.

4. Contribution of course to meeting the professional component (ABET only – undergraduate courses) - 2 credits of Engineering Science, 2 credits of Engineering Design

5. Relationship of course to program outcomes: Skills student will develop in this course (ABET only undergraduate courses) - ABET EE2, b, c, e, k

6. Instructor - Dr. Eric M. Schwartz
   a. Office location: MAEB 321
   b. Telephone: 392-2541
   c. E-mail address: ems@mil.ufl.edu
   d. Class Web site:
   e. Office hours:

7. Teaching Assistant - TBD
   a. Office location:
   b. Telephone:
   c. E-mail address:
   d. Office hours:

8. Meeting Times - T 4th period/R 4-5th periods; lab meeting times vary depending on your section

9. Class/laboratory schedule - 3 class periods consisting of 50 minutes each and one period consisting of 3 hours

10. Meeting Location - class meets in CHE 237; lab meets in NEB 248

11. Material and Supply Fees - $91.55

12. Textbooks and Software Required -
a. Title: Fundamentals of Logic Design  
b. Author: Charles H. Roth Jr  
d. ISBN number: 0495471690  
e. Hardware: USB Blaster programming cable (from Altera). The price for this cable is $50 plus tax. The cable is available at the UF bookstore; go to the counter in the computer area to request one. You will also need your own laptop PC for use in lab and possibly during the exams.

13. Recommended Reading -  
a. Title:  
b. Author:  
c. Publication date and edition:  
d. ISBN number: 

14. Course Outline (provide topics covered by week or by class period) –

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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| 1    | Digital Design, Basic logic, Number Systems, Math  
Intro. to Altera's Quartus (for schematic entry and simulation)  
Mixed Logic (Direct Polarity Indication) |
| 2    | ICs, introduction to mixed, positive, and negative logic  
Number Systems  
Mathematics of binary, octal and hexadecimal and conversions |
| 3    | Number Systems  
Mathematics of binary, octal and hexadecimal and conversions  
Boolean Algebra |
| 4    | MSOP, MPOS, Simplification  
MSI: MUX, DeMUX, Decoder  
Karnaugh Maps (K-Maps) |
| 5    | More MSI: encoder, adder, BCD 7-seg decoder, tristate buffer  
Arithmetic Logic Unit (ALU) |
| 6    | Introduction to sequential circuits: Flip-flops  
Flip-flops and next state/excitation tables  
Design with flip-flop, Counter design, Debouncing |
| 7    | MSI sequential circuits - Registers, counters  
Introduction to VHDL |
| 8    | RAM, ROM PLDs, PALs  
Altera’s MAX3000 and MAX7000 family CPLDs  
State machines: Mealy, Moore, ASM design |
| 9    | ASM implementation, ASM design examples  
ASM design implementations, ROM based designs & others |
| 10   | ASM design implementations, ROM based designs & others  
RAM/ROM expansion |
| 11   | Introduction into computer architecture |
12 | Continued Introduction into computer architecture  
| Addressing modes, Data transfer instructions

13 | Basic computer operation cycles and timing  
| Instruction set and assembly programming examples

14 | Intro into computer architecture, registers, assembly & instructions

15 | G-CPU, Memory Maps  
| G-CPU Modifications, Special topics

16 | G-CPU Modifications, Special topics

15. Attendance and Expectations - Class attendance is not mandatory, but all classes are important. Missing a class may be hazardous to your grade. There will be pop (unannounced) quizzes. A missed quiz cannot be made up. Turn off all cell phones, beepers, laptop sound effects, and other noise making devices before entering our classroom. If a noise-making device goes off during class, I reserve the right to lower your course grade. If a noise-making device goes off during an exam, your will lose a significant number of points on this exam.

- Perform all laboratory experiments. A grade of 65% or better in Lab is required in order to obtain a passing grade. Your lowest lab (not including lab 8) will be dropped. But use this drop wisely, i.e., do not just skip a lab since all labs are important and your next missed lab may be unavoidable. If you need to miss a single lab, it’s ok; you cannot make up the missed lab. (You should do this lab on your own.) If you have a valid reason for missing this lab, get documentation for your first missed lab and hold on to it. If you miss a second lab, you must show the professor (not the TA) written documentation for BOTH your first and your second missed labs. This documentation should be official and from a doctor, judge, etc., so that a make-up can be arranged. You must notify the professor prior to your scheduled second missed lab or as soon as possible after your second missed lab.
- Labs must be done at scheduled times.
- An average lab grade of 65% or higher is required to be eligible to pass the class!
- Do all homework assignments and turn them in within the first 3 minutes of class.
- Late homework will not be accepted.
- A quiz can happen at any time, during any class, i.e., quizzes are generally not announced ahead of time. You should therefore not miss class.

Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

16. Grading –  
Midterm Exams (2 @ 33%) 66%  (Exam 2 is comprehensive; 90 or better on final results in 5% grade bonus)  
Laboratory 30%* (Lab values vary, i.e. it could count as 1/3 a lab, a
A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

18. Make-Up Exam Policy - Missed quizzes cannot be made up. The same policy applies to missed labs. If you have a University-approved excuse and arrange for it in advance, or in case of documented emergency, a make-up exam will be allowed and arrangements can be made for making up missed work. University attendance policies can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Otherwise, make-up exams will be considered only in extraordinary cases, and must be taken before the scheduled exam. The student must submit a written petition to the instructor two weeks prior to the scheduled exam and the instructor must approve the petition.

19. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

“…failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures (http://www.dso.ufl.edu/sccr/procedures/honorcode.php)

20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological
and psychiatric services.
· Career Resource Center, Reitz Union, 392-1601, career and job search services.

22. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.