Text: None. (Lab handouts will be provided on a week-by-week basis.)

Course Description: Design and verification of digital systems using simulation. Laboratory implementation using standard, integrated circuits and programmable logic devices.

Prerequisite: EE 3376 and EE 3176, each with a grade of “C” or better.
Prerequisite by Topic:
   (1) combinational and sequential digital design techniques
   (2) basic microprocessor architecture
   (3) assembly language programming
   (4) High-Level language programming

Corequisite: EE 4342 -- Design techniques for complex digital systems, with emphasis on computer hardware design and computer-aided techniques, including hardware description languages and hardware simulation packages. Algorithmic State Machine design is stressed for small systems. Emphasis on problem definition, design, and verification.

Students completing EE 4142 will be able to:
1. Utilize the IDE design environment to create digital sequential circuits.
2. Carry out the design cycle of design, simulation, verification, and implementation.
3. Troubleshoot circuitry at any step of the design cycle, in simulation or hard-wired circuits.
4. Recognize and apply typical hardware constructs for processing units.
5. Recognize and apply typical hardware constructs for control units: hardwired and microprogrammed.
6. Design a full central processing unit.

Materials Required: No special supplies required. (All lab procedures will be carried in the lab, Engineering Building, Room E-340, which has the workstations outfitted with the simulation environment and connections to the target FPGAs. Lab reports must be created using the MSWord template, and printed on regular 8.5”x11” paper.)

Guidelines:
Each lab is divided into three important tasks: Pre-lab, Demonstration, and Lab Report. Students are responsible for working on the Pre-lab, which is hand written and includes a preliminary design of the assignment. Group discussion is strongly recommended, but each individual must submit their own work.

Prelabs will be assigned and due the week prior to carrying out the lab, on Wednesdays. Graded prelabs will be returned on Fridays. Apart from the assigned lab session, the TA has office hours to help you with questions. However, completed labs can only be checked out (demonstration & trouble-shooting, if necessary) during assigned lab session. If a student fails to show up on his/her checkout time, points will be deducted. At the start of the lab session students should have their Pre-lab graded. Before calling the TA for demonstration, make sure you have everything ready (Pre-lab, circuit to be tested in software/bread-board). Also be prepared to answer questions pertaining to that lab. If the circuit doesn’t work at the checkout time, the lab will be graded for partial points. Extra time will be allotted but points will be deducted.

You must turn in a formal lab report with figures and diagrams, due by the beginning of the next lab session. The report format should contain Objective, Equipment, Lab Procedure and Results/Verification, and
Conclusion. A template for your lab report will be provided. If a program is attached to the lab report, make it an Appendix to your report, and be sure it has the required comments.

<table>
<thead>
<tr>
<th>Grades</th>
<th>Point distribution</th>
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<tbody>
<tr>
<td>Grading will be based on the standard scale</td>
<td>Each lab is worth 100 points</td>
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<tr>
<td>90% - 100% → A</td>
<td>20 points – Prelab</td>
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<tr>
<td>80% - 89% → B</td>
<td>30 points – Demo at checkout time</td>
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<tr>
<td>70% - 79% → C</td>
<td>50 points – Lab report</td>
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<tr>
<td>60% - 69% → D</td>
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<tr>
<td>Below 60% → F</td>
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**ACADEMIC HONESTY**
As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self-responsibility. The assumption that a student’s work is a fair representation of the student’s ability to perform forms the basis for departmental and institutional quality. All students within the Department are expected to observe appropriate standards of conduct. Acts of scholastic dishonesty such as cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in the whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts will not be tolerated. Any case involving academic dishonesty will be referred to the Office of Student Conduct and Conflict Resolution (OSCCR). The Associate Dean of Students will assign a Student Judicial Affairs Coordinator who will investigate the charge and alert the student as to its disposition. Consequences of academic dishonesty may be as severe as dismissal from the University. See the OSCCR homepage at http://sa.utep.edu/osccr/ for more information.

**AMERICAN DISABILITIES ACT**
If you feel you may have a disability that requires accommodations, contact the Center for Accommodations and Support Services (CASS) at 747-5148 or go to the Union East, Room 106.