The University of Texas at Tyler
Department of Electrical Engineering

Course: EENG 4332 – FPGA Design

Syllabus

Catalog Description:
Digital systems design with Field Programmable Gate Arrays (FPGAs); Design and synthesis of reconfigurable logic with high-level descriptor languages; Logic design using FPGAs; Architectural and systems design issues; Three hours of lecture each week.

Prerequisites: EENG 3307 Microprocessors and EENG 4309 Electronic Circuits II

Credits: ( 3 hours lecture, 0 hours laboratory per week )


Course Coordinator: David Hoe, Assistant Professor, Electrical Engineering

Topics Covered: Digital systems design with FPGAs; Using CAD tools; Combinational and sequential logic design using FPGAs; Architectural issues; Fine-grained versus coarse-grained fabrics; Systems design issues.

Evaluation Methods: Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Objectives: By the end of this course students will be able to:
1. Explain how FPGAs are used in digital systems design [1,2,4]
2. Use VHDL to specify and implement FPGA designs [1,4,5]
3. Use CAD tools in the design, simulation, and implementation of FPGA designs [1,2,4,5]
4. Explain how reconfigurable logic is implemented in a VLSI process [1,2]
5. Design and implement sequential and combinational logic circuits with FPGAs [1,2,3,4,5]
6. Identify the issues at the architectural level associated with reconfigurable logic design [1,2,3,5]
Relationship to Program Outcomes (only items in dark print apply): This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering;
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering;[2,3,5]
3. have the ability to analyze electrical circuits, devices, and systems;[1,4,5,6]
4. have the ability to design electrical circuits, devices, and systems to meet application requirements;[3,5,6]
5. have the ability to design and conduct experiments, and analyze and interpret experimental results;
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods;
7. have effective written, visual, and oral communication skills;
8. possess an educational background to understand the global context in which engineering is practiced, including:
   a. knowledge of contemporary issues related to science and engineering;
   b. the impact of engineering on society;
   c. the role of ethics in the practice of engineering;
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams;
10. have a recognition of the need for and ability to pursue continued learning throughout their professional careers; [1,4,6]

Contribution to Meeting Professional Component: (in semester hours)

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<th>Component</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Mathematics and Basic Sciences</td>
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<tr>
<td>Engineering Sciences and Design</td>
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Prepared By: David Hoe  
Modified By:          
Date: 17 Jan 2011