The University of Texas at Tyler  
Department of Electrical Engineering  

Course: EENG 5335 – 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; Fine-grained versus coarse-grained fabrics. Reconfigurable computing with FPGAs. Course project(s) required. Three hours of lecture each week.  

Prerequisites:  
EENG 3307 Microprocessors and EENG 4309 Electronic Circuits II or consent of instructor  

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

Text(s):  

Additional Material:  
Class Notes; Journal Articles  

Course Coordinator:  
David Hoe, Assistant Professor, Electrical Engineering  

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

Evaluation Methods: (only items in dark print apply):  
1. 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  
3. Use CAD tools in the design, simulation, and implementation of FPGA designs
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]
7. Describe the tradeoffs involved in coarse-grain versus fine-grained reconfigurable systems [1,2]
8. Design reconfigurable computer systems using FPGAs [2,3,5]
9. Appraise the latest research into reconfigurable systems design presented in journals [1,3,5]

*Numbers in brackets refer to method(s) used to evaluate the course objective.*

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. Possess a breadth and depth of knowledge in electrical and computer engineering. [1,2,3,4,5,7]
2. Possess and demonstrate oral and written communication skills. [1,4,6,7,9]
3. Demonstrate the capability to perform independent learning and investigation. [6,7,8,9]

*Numbers in brackets refer to course objective(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

| Mathematics and Basic Sciences: | 0 hours |
| Engineering Sciences and Design: | 3 hours |
| General Education Component: | 0 hours |

Prepared By: David Hoe
Modified By: Date: 17 Jan 2011