

Reconfigurable Computing (CPRE 583, Fall 2011)

Instructor: Prof. Phillip Jones (phjones@iastate.edu, Durham 329, 515-294-9208)

Office hours: Wednesday and Friday 12:00 – 1:30 pm, Durham 329

Meeting times and location: Wednesday and Friday 9:30 – 10:50am, Marston 0204

Website: <http://class.ece.iastate.edu/cpre583>

Credits: 3

Grading breakdown:

Final Project: 20% (~6 weeks)
Assignments (MPs) 25%
Homework 15%
Midterm #1 20% (30% take home, 70% in class)
Midterm #2 20% (30% take home, 70% in class)

Note: MPs = Machine Problems. These are hands-on assignments

Textbook: S. Hauck, Andre Dehon, “Reconfigurable Computing: The Theory and Practice of FPGA-Based Computing”, 2008

Platform for hands-on assignments (ML507):

<http://www.xilinx.com/products/boards-and-kits/HW-V5-ML507-UNI-G.htm>

Schedule:

Date	Topics	Readings (before class)	Assignments Due	Final Projects
Wed (8/24)	Course Overview & Reconfigurable Computing Usage Models, Assign HW1 (VHDL primer)			
Fri (8/26)	VHDL overview #1			
Wed (8/31)	Reconfigurable Computing Hardware	Chapter 1		
Fri (9/2)	VHDL overview #2 Assign MP1 (UART)			
Wed (9/7)	Overview VHDL to hardware flow			
Fri (9/9)	VHDL overview #3, Assign HW 2 (Mini-survey)		HW1 (midnight)	
Wed (9/14)	VHDL overview #4			
Fri (9/16)	Reconfigurable Computing History & Applications, Assign MP2 (matching)	Chapter 3 Reading: 1,2	MP1 (midnight)	Brainstorm Project topics

Wed (9/21)	Reconfigurable Computing Architectures	Chapter 2 Readings:3, 4		
Fri (9/23)	Reconfiguration Management	Chapter 4	Mini-survey P1 (in class)	Start forming teams
Wed (9/28)	Case Study (Convey Computer: HC-1)	Readings: 5, 6		
Fri (9/30)	System-on-chip (EDK/XPS) tools overview (Project Advertise)		Mini-survey (midnight)	
Wed (10/5)	Midterm Review (Project Advertise)			
Fri (10/7)	Midterm #1			Submit teams: Mon (10/10 midnight)
Wed(10/12)	Floating Point	Chapter 23.1 & 31		
Fri (10/14)	Using IP cores (Corgen overview) MP3 assigned (PPC coprocessor)		MP2 (midnight)	Project proposal (midnight)
Wed(10/19)	Class Project Topic Presentations			
Fri (10/21)	Design Patterns & Compute Models	Chapter 5.1 Reading: 7		Update: Fri (midnight)
Wed (10/26)	Compute Architectures	Chapter 5.2		
Fri (10/28)	Streaming Architectures, HW 3 assigned (VHDL-to-FPGA)	Chapter 8 & 9	MP3 (midnight)	Update: Fri (midnight)
Wed (11/2)	Data Parallel Architectures	Chapter 10		
Fri (11/4)	Evolvable Hardware	Chapter 33 Readings: 8,9,10		Update & Final Report Draft: Fri (midnight)
Wed (11/9)	Midterm review	Readings:11,12		
Fri (11/11)	Midterm #2			Update: Fri (midnight)
Wed (11/16)	Synthesis (guest lecturer:Dr. Tyagi?)			
Fri (11/18)	Map & Placement	Chapter 13, 14 & 16		Project update (midnight)
Mon (11/21) - Fri (11/25)	Thanksgiving Break (No Classes)			
Wed (11/30)	Routing	Chapter 17		
Fri (12/2)	Case study		HW3 (midnight)	Initial Project submission: (midnight)
Wed (12/7)	Reserved scheduling flexibility			
Fri (12/9)	Reserved for scheduling flexibility			
Mon-Fri (12/12-12/16)	Project Presentations (2 days)			Final submission (Monday 12/19midnight)