CPET-233 Digital Systems Design

Fall 2019

Class Meeting:

Monday/Wednesday 11:00 – 11:50 am SLA-2170

Instructor:

Holly Dickens
Office: GOL-1345
Phone: 5-6537
Office hours: Posted in MyCourses or by appointment
Email: hldiee@rit.edu

Course Description:

This course covers the design and simulation of digital circuits using modern digital design techniques. Using a hardware description language, students will design, synthesize and analyze finite state machines and combinational, sequential and arithmetic logic circuits Topics will include: design for synthesis, verification techniques, memory circuits, programmable logic devices, and implementation technologies.

Students, upon completion of this course, will have the necessary skills to analyze, and design advanced combinational and sequential logic circuits targeted for programmable logic devices. In addition, students will be introduced to hardware description languages and exposed to digital logic systems fabrication methodologies and processes.

Pre-Requisite: CPET-141 (Digital Fundamentals), CPET-142 (Digital Fundamentals Lab)
Co-Requisite: CPET-233 (Digital Systems Design Laboratory)

Intended Learning Outcomes:

1. Design advanced digital logic circuits
3. Design finite state machines using state diagrams
4. Design basic combinatorial and sequential logic systems using an HDL
5. Use a digital event driven simulator to verify HDL design correctness
6. Use a synthesis tool to map the HDL design into a programmable logic device
7. Understand how a finite state machine can be represented in an HDL
8. Design advanced arithmetic components in an HDL

Method of Instruction:

Two 50 minute lectures per week.

Course Policies:

- Weekly Homework Assignments and Quizzes - 15%

Homework will be assigned and collected weekly. Each assignment will be graded for completeness and accuracy. Assignments are due in the dropbox in MyCourses prior to class time on the day in which they are due. Announced and unannounced quizzes will be given during the quarter. They will be based on the homework and reading assignments. The lowest grade from the homework/quiz category will be dropped from the average.

- Hour Exams (3) - 35%

There will be three 50 minute exams given during the quarter. The exams will be given during lecture section and are tentatively scheduled for 9/23/19, 10/21/19 and 11/18/19.
Make-up exams will only be allowed for extreme circumstances. If you have a conflict, please make arrangements ***prior*** to the exam date.

- Final Examination - 20%

The final examination day and time are set by the university and may not be changed unless there is a direct conflict with another exam or you have more than 2 exams in one day.

- Labs/Lab Reports - 30%

Please see the lab syllabus for lab requirements/needs.

- Class Participation and Attendance

Although no percentage of the grade is determined by class participation and attendance, these factors will be taken into consideration when deciding grades that are on the cusp of the letter grade cutoffs that are shown below.

- Final Letter Grade

Your final letter grade for the class will be based on the following scale:

93.00 – 100.00	A
90.00 – 92.99	A-
87.00 – 89.99	B+
83.00 – 86.99	B
80.00 – 82.99	B-
77.00 – 79.99	C+
73.00 – 76.99	C
70.00 – 72.99	C-
60.00 – 69.99	D
00.00 – 59.99	F

• Grade Dispute
If you feel that you have been unfairly graded on any test or assignment, you will have 2 weeks from the time the work is returned to your mail folder to meet with me about it. It is your responsibility to check your mail folder regularly.

- Course Supplies:
  - Textbook: Circuit Design and Simulation with VHDL, 2nd Edition, by Pedroni
  - Altera DE0-CV development board. See Ken or Chris for board rental
  - Three ring binder for Lab material
  - Binder for lecture notes*
  - Altera Quartus Prime Lite Edition Software v18.1 (optional)
  - A laptop is not required for this class, but if you have one, you are encouraged to bring it to class for in-class coding exercises

*Lecture notes will be provided on MyCourses prior to class. It is your responsibility to print the notes and bring them to lecture if you wish to reference them.

Remember RIT Resilience

Success depends heavily on your personal health and well-being. **Recognize** that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom. Your instructors strongly encourage you to **reframe** challenges as opportunities for growth. **Reflect** on your role in taking care of yourself throughout the term, before the demands of exams and projects reach their peak. Please feel free to **reach out** to your professors about any difficulty you may be having that may impact your performance as soon as it occurs and before it becomes unmanageable. In addition to your academic advisor, you are strongly encouraged to contact a number of other support services on campus that stand ready to assist you.

Academic Accommodations:

"RIT is committed to providing reasonable accommodations to students with disabilities. If you would like to request accommodations such as special seating or testing modifications due to a disability, please contact the Disability Services Office. It is located in the Student Alumni Union, Room1150; the website is www.rit.edu/dso. After you receive accommodation approval, it is imperative that you see me during office hours so that we can work out whatever arrangement is necessary."

Academic Dishonesty:

Students are encouraged to study together, but must do their own work. All students are required to submit original work. It is Plagiarism in any form will not be tolerated. Any acts of academic dishonesty will be treated in accordance with the RIT policy.

RIT Policy:
http://www.rit.edu/studentaffairs/studentconduct/rr_academicdishonesty.php

Consequences of academic dishonesty: Any act of Academic Dishonesty will incur the following possible consequences. After notifying and presenting the student with evidence of such misconduct, the instructor has the full prerogative to assign an "F" for the offense, or to assign an "F" for the entire course. The instructor will inform and, if possible, meet with the student concerning the decision reached on the "F" for the offense, or the "F" for the entire course. A student may be brought before the Academic Conduct Committee of the College in which the alleged offense occurred, and may face academic suspension or dismissal from the Institute (See D17.0, Academic Conduct and Appeals Procedures," and D18.0, "RIT Student Conduct Process.").

Policy C 6.0 Policy Prohibiting Discrimination and Harassment/Title IX Reporting:

RIT is committed to providing a safe learning environment, free of harassment and discrimination as articulated in our university policies located on our governance website. RIT's policies require faculty to share information about incidents of gender based discrimination and harassment with RIT's Title IX coordinator or deputy coordinators, regardless whether the incidents are stated to them in person or shared by students as part of their coursework.
If you have a concern related to gender-based discrimination and/or harassment and prefer to have a confidential discussion, assistance is available from one of RIT's confidential resources on campus (listed below).

1. The Center for Women & Gender: Campus Center Room 1760; 585-475-7464; CARES (Available 24 hours/7 days a week) Call or text 585-295-3533.
2. RIT Student Health Center – August Health Center/1st floor; 585-475-2255.
3. RIT Counseling Center - August Health Center /2nd floor - 2100; 585-475-2261.
4. The Ombuds Office – Student Auxiliary Union/Room 1114; 585-475-7200 or 585-475-2876.
5. The Center for Religious Life – Schmitt Interfaith Center/Rm1400; 585-475-2137.
6. NTID Counseling & Academic Advising Services – 2nd Floor Lynden B. Johnson; 585-475-6468 (v), 585-286-4070 (vp).