ECE 271

Digital Logic Design

MWF, 1000-1050 WNGR 153

Instructor: Matthew W. Shuman
Email: shumanm@oregonstate.edu
Website: http://engr.oregonstate.edu/ shumanm
Office Location: KEC 1115
Office Phone: (541) 737-1072

This statement is the original plan of the course. Plans can change through the course of the term, and changes will be sent out to the class email list. Check your OSU email account daily.

Course Description: ECE 271 is an introduction to digital logic design. This class focuses on number systems, logic gates, combinational logic timing and minimization, registers and memory, sequential logic, and an introduction to Hardware Description Languages.

Prerequisite(s): MTH 231

Course Objectives:
At the completion of this course, students will be able to:

1. Map the high-level description of a digital system into a binary description. (ABET Outcomes: A, M)
2. Analyze and design combinational systems using standard gates and minimization methods (such as Karnaugh maps). (ABET Outcomes: A, C, N)
3. Analyze and design simple synchronous sequential systems. (ABET Outcomes: A, C, N)
4. Analyze and design sequential systems composed of standard sequential modules, such as counters and registers. (ABET Outcomes: A, C, N)
5. Perform basic arithmetic operations with signed integers represented in binary. (ABET Outcomes: A, M, N)

Grade Distribution:

In-class problems	20%
Reading Reports	40%
Course Project	10%
Final	30%

Letter Grade Distribution:

>= 92.50	A	72.50 - 76.50	C
89.50 - 92.50	A-	69.50 - 72.50	C-
86.00 - 89.50	B+	66.50 - 69.50	D+
82.50 - 86.50	B	62.50 - 66.50	D
79.50 - 82.50	B-	59.50 - 62.50	D-
76.50 - 79.50	C+	<= 59.50	F

Course grades can be curved up based on class attendance, participation in lecture or office hours, or helping others with posts on the lab forum. Grades will not be curved down, everyone can earn an **A**.

Course Policies:

- **General**
  - Laptops, phones, and campus newspapers or other distractions are not to be used during lecture, for reasons stated in this article. Tablets and other devices that lay flat on the desk will be allowed in a specified section of the lecture hall.
  - Respect, professionalism, and maturity are required in this course of the TAs, Instructor, and students. The following actions show disrespect or immaturity:

    Being tardy for lecture
    Leaving lecture early
    Chronically sleeping in lecture
    Yelling at the instructor for not accepting a late assignment
    Being personally offended from objective criticism
    Being personally critical
    Barging into office hours and interrupting current conversations
    Using distractingly poor grammar in e-mails or Canvas discussions
  - Emails should refer to the instructor as Mr. Shuman. Use this link for more information about crafting a professional email.
- **Grades**
  - Grades in the **C** range represent performance that **meets expectations**; Grades in the **B** range represent performance that is **substantially better** than the expectations; Grades in the **A** range represent work that is **excellent**. You are not entitled to an **A**, but preparation, hard work, and maturity can help you earn a good grade in this course.
  - Grades will be maintained in the Canvas. Students are responsible for tracking their progress by referring to the online gradebook. Grading concerns should be brought to the instructors attention within a week of the grade being posted on Canvas.
- **Labs and Assignments**
  - Students are expected to work independently, unless specified to submit work in groups. Cheating, fabrication, assisting, tampering, and plagiarism are all forms of academic dishonesty and will be penalized according to the Student Conduct and Community Standards. Here is the process for dealing with academic dishonesty, and here are the forms. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor, tutor, or lab assistant.

- **No late assignments will be accepted under any circumstances**. Assignments can be submitted several days before the due date, but assignments submitted through Canvas will not be accepted even one second late. Assignments can be submitted multiple times, but only the most recent submission will be graded.
- In-class problems will be on the last school day of each week throughout the term. There will be no makeups for absences. The two lowest scores of the term will be dropped.
- A reading report will be due the day a new chapter is started, the first day of week 3, 5, 7, and 9. These are a substantial portion of your course grade. Submit them early, because no late reports will be accepted.
- The final exam will be held at the time[1] and room[2] reserved by the course registrar. The location will be confirmed by week 8 of the term.

- **Attendance and Absences**
  - Attendance is required. You are responsible for all assigned readings and content discussed in lecture.
  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

- **Office Hours**
  - Office hours are not to receive a makeup lecture, nor is it a place to start your homework. Questions during office hours must be accompanied by a genuine start on the question being asked. This could be a confusing paragraph in the textbook, which is preventing you from taking lecture notes. This could be a difficult homework problem that has you stumped.
  - 272 projects must be documented according to the standards set on the 272 website in order to be brought to office hours.

- **Course Schedule**

  Weekly Schedule

  1. Chapter 1-1 to 1-4
  2. Chapter 1-5 to 1-9
  3. Chapter 2-1 to 2-7
  4. Chapter 2-8 to 2-10
  5. Chapter 3-1 to 3-3
  6. Chapter 3-4 to 3-7
  7. Chapter 4-1 to 4-4
  8. Chapter 4-5 to 4-10
  9. Chapter 5-1 to 5-7
  10. Chapter 8-6, Guest Speaker, and Final Exam Review

[1] https://classes.oregonstate.edu/?keyword=ece%20271
[2] http://catalog.oregonstate.edu/CourseDetail.aspx?subjectcode=ECE&coursenumber=271

- **PATD** has two meanings, Point After TouchDown, and Pay Attention To Detail. Both meanings are related. Details matter. Remember Serna's experience on September 4th, 2004[3]. In 1999, NASA had a $125 million dollar mistake[4], based on units. Details matter. If you see PATD in this course, then **P**ay **A**ttention **T**o **D**etail.

[3] http://www.buildingthedam.com/2013/8/9/4602314/7-most-painful-beaver-losses-of-the-modern-era
[4] https://en.wikipedia.org/wiki/Mars_Climate_Orbiter