



Course Syllabus

CPR E 281: Digital Logic

Sections (4, 5, 6, 7, 8, 10 & 11)

Lecture Instructor

Dr. Mohamed Selim
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Course Catalog Description and Prerequisite

Number systems and representation. Boolean algebra and logic minimization. Combinational and sequential logic design. Arithmetic circuits and finite state machines. Use of programmable logic devices. Introduction to computer-aided schematic capture systems, simulation tools, and hardware description languages. Design of simple digital systems.

Prerequisites: Sophomore Classification

Course Delivery

Format: Face-to-face delivery

- Lectures: In-class. A recorded version of each lecture will be available via Canvas an hour after the lecture – Coover 2245
- Labs: Physical attendance – Coover 2042
- Homework: Online submission (late submission will not be accepted except with a documented excuse)
- Exams: in-class – Coover 2245

Labs

There will be a **3-hour lab every week** (No labs the first week of classes), and they are an essential component of this class. You must submit the pre-lab assignment before the starting time of your lab section. There are 11 labs, but the first one will be graded as submitted/not submitted. You are expected to attend ALL the labs.

All the labs will be in Coover 2042, and the instructions for each lab will be available on Canvas. Students will get access to all the software tools needed for the labs, and the TA will be available during lab time to assist and check out the labs. Students must attend the lab section for which they are registered and demo each lab to their TA. Switching sections is not allowed except with the course instructor's approval (you will need to work with student services to switch). There are six lab sections, as mentioned below:

- Section 10: Tuesday 09:00 am
- Section 04: Tuesday 12:10 pm
- Section 08: Tuesday 06:10 pm
- Section 05: Wednesday 06:10 pm
- Section 06: Thursday 12:10 pm
- Section 11: Thursday 06:10 pm
- Section 07: Friday 12:05 pm

Learning Outcomes

Students who successfully complete CPRE 281 Digital Logic will have:

- Understanding of number systems and codes and digital representation of data.
- Understanding of the general concepts in digital logic design, including logic elements, and their application in combinatorial and sequential logic circuit design quality.
- Familiarity with computer-aided schematic capture systems, simulation tools and hardware description language.
- Familiarity with programmable logic devices.

Learning Objectives

To introduce number systems and codes, digital representation of data, and to teach the general concepts in digital logic design, including logic elements, and their use in combinatorial and sequential logic circuit design. Students will also be introduced to computer-aided schematic capture systems, simulation tools and hardware description languages, and will use programmable logic devices.

Textbooks

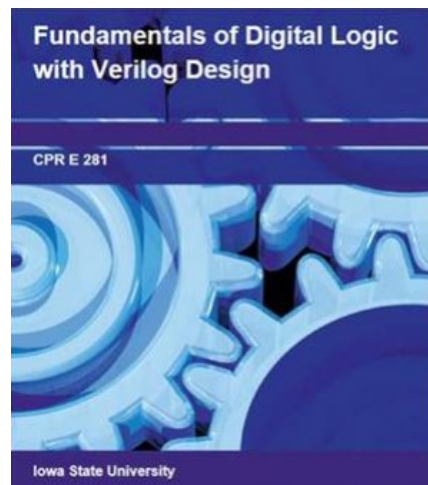
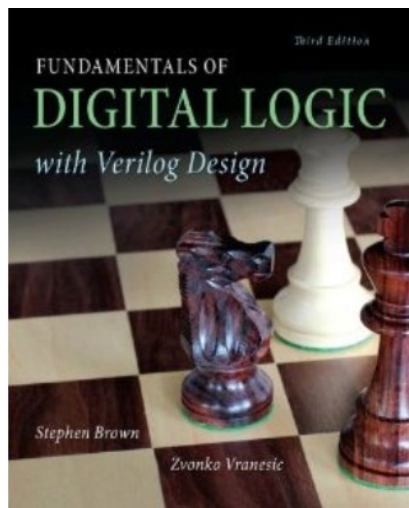
Title: **Fundamentals of Digital Logic with Verilog Design [3-rd edition]**

Author: Stephen Brown and Zvonko Vranesic

Edition: Copyright 2013, 3rd edition

ISBN: 978-0073380544

Publisher: McGraw-Hill



This course is enrolled in the Iowa State University Immediate Access Program. Immediate Access is a collaborative program where the University Book Store, faculty, and publisher have worked together to ensure access to the "Fundamentals of Digital Logic with Verilog" ebook the first day of class at a reduced price compared to the national average.

You can view the ebook after the instructor has published the course in Canvas. **To view the ebook:**

1. Click on the [Immediate Access link](#) on the Canvas course homepage.
2. Click on "View Course Materials" and follow the instructions to receive access to the ebook. (The ebook may not be available to view until the first day of class).

You will be automatically charged on your u-bill for this digital content. You will see the charge listed as CPR E 281 IMMED ACCESS 0281. Students who drop the course within the first 10 days of class will receive a refund on their u-bill. **YOU DO NOT HAVE TO NOTIFY THE BOOKSTORE IF YOU DROP THE COURSE** within the first 10 days.

Students may also choose to opt-out of the program. Opting out does not mean you are dropping the course. It simply means you are choosing not to receive the digital content from the bookstore, and you may find another way to acquire it. Students have within the first 10 days of class to opt-out and receive a refund to their u-bill (5 days for courses 8 weeks or shorter). To opt-out, click on the Immediate Access link on the Canvas course homepage, then click on "View Your Course Materials", go to the bottom of the next page and click on the opt out link. Should you change your mind after opting out, there will be an option to opt back in within the first 10 days of class (5 days for courses 8 weeks or shorter). You may not be able to use the opt out feature until your instructor has published this course in Canvas.

An optional loose-leaf version of the book will be available at the bookstore after the first 10 days of class. This loose-leaf DOES NOT replace the digital content you receive in Immediate Access and is only available to students who remain opted into Immediate Access after the opt-out period has ended.

For further questions about Immediate Access, please email immediateaccess@iastate.edu.

Homework Assignments

There will be a total of 12 homework assignments, and the student will have a week to complete each one of them. These assignments will be used to emphasize and clarify important concepts discussed in the lectures. **The first homework must be submitted, but it is graded in a binary fashion (submitted/not submitted).**

All the homework assignments must be submitted in **pdf file format (one file)** and **uploaded to Canvas on or BEFORE Monday 11:59 PM** each week.

IMPORTANT: Due to the large size of this class, we cannot and WILL NOT accept late homework.

Quiz

There will be 4 online quizzes delivered via Canvas, and the students will have 24 hours to complete each one. These assignments will be used to emphasize important concepts discussed in the lectures and prepare students for the upcoming exams.

Exams

Midterm Exams:

- There will be **two midterm exams** for this class. The midterms are scheduled as below:
Midterm 1: Friday, Feb. 16th from 4:25 PM - 5:15 PM (during the lecture period)
Midterm 2: Friday, March 29th from 4:25 PM - 5:15 PM (during the lecture period)
- Both midterms will be closed-book but open notes (up to 2 single-sided letter-sized sheets of paper, typed or hand-written).
- Both midterms will be held in class. More instructions will be given before the exams via Canvas.

Final Exam:

- There will be a final exam during finals week. The final exam is currently scheduled for Wednesday, May 08th, from 2:15 PM to 4:15 PM.
- The exam will be closed-book but open notes (up to 2 single-sided letter-sized sheets of paper (or one double-sided), typed or hand-written).
- The exam will be held in-class. More instructions will be given before the exam via Canvas.

Grading Policy

Grading Scale:

93 - 100 = A
90 - less than 93 = A-
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87 - less than 90 = B+
83 - less than 87 = B
80 - less than 83 = B-
++++
77 - less than 80 = C+
73 - less than 77 = C
70 - less than 73 = C-
++++
67 - less than 70 = D+
63 - less than 67 = D
60 - less than 63 = D-
++++
0 - less than 60 = F

Grading Percentages:

Homework:	20%
Labs:	20%
Quizzes:	06%
Lab Attendance:	03%
Midterm Exam 1:	15%
Midterm Exam 2:	15%
Final Project	06%
Final Exam:	15%
Lecture Attendance:	02%
=====	
TOTAL:	102%

Appealing a Grade:

You will have a one-week window of appeal after each homework/exam is graded and returned. The grade challenge must be in writing (email is ok) and clearly state the problem on the homework/exam in question and the reason for your challenge. The written statement and the original exam must be submitted to the instructor during the one-week window. After one week, the grade cannot be changed, and it is final.

Class Attendance Policy

You are expected to attend ALL lectures and ALL labs. Attendance will be taken in every lab section. Lecture attendance will be taken randomly without notice via an attendance quiz. Extenuating circumstances and other absences from the classroom will be handled in accordance with university policies ([Read this](#)) and/or case-by-case basis at the instructor's discretion.

Policy on Collaboration

You are encouraged to form study groups and discuss the reading materials assigned for this class. You are allowed to discuss the homework assignments with your colleagues. However, each student will be expected to write his/her own solutions/code. Sharing of code is not allowed. No collaboration will be allowed during the exams.

IMPORTANT: Cheating, plagiarism, and other academic misconducts will not be tolerated and will be handled according to the [ISU's academic dishonesty procedures](#).

Academic Dishonesty

The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the [Dean of Students Office](#).

Accessibility Statement

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This

document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at www.sas.dso.iastate.edu, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

Classroom Behavior Policy

Combined effort of students and instructor is essential to foster productivity and provide better learning experience for all registered students. Disruption of any kind in the classroom and the laboratory will not be tolerated. Student(s) identified as being disruptive will be removed from the classroom and laboratory. The Dean of students will be notified about the disruptive behavior and further action as deemed necessary will be taken.

Discrimination and Harassment

Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor, [Student Assistance](#) at 515-294-1020 or email dso-sas@iastate.edu, or the [Office of Equal Opportunity](#) at 515-294-7612.

Mutual respect and Professionalism

You are expected to treat your instructor/teaching assistants/peer students and all other participants in the course with courtesy and respect. Your comments to others should be factual, constructive, and free from harassing statements. You are encouraged to disagree with other students, but such disagreements need to be based upon facts and documentation (rather than prejudices and personalities). It is the instructor's goal to promote an atmosphere of mutual respect in the classroom. Please contact the instructor if you have suggestions for improving the classroom environment. It is preferable if students discuss issues directly with the instructor, however, students may also leave a note in the instructor's mailbox.

Religious Accommodation

Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the [Dean of Students Office](#) at 515-294-1020 or the [Office of Equal Opportunity](#) at 515-294-7612.

How to Access Course Materials?

1. Follow this [link](#) and log on to Canvas with your NetID
2. Select the course (e.g., CPRE 281 from the Dashboard)

Announcements

Announcements may be made in classroom and/or through Canvas. Regular classroom attendance will keep students updated of classroom activities/announcements. Students must also periodically check Canvas (including Canvas announcements and announcements in the posted slides) for announcements and updates outside of regular class hours.

Teaching Assistant help throughout the semester

You will have two TAs in your lab section. They will be your grading TAs for demonstrations, as well as your instructors for the lab portion of this course. They will have office hours to help you with your coding or to explain concepts if you are having problems. Get to know them! They have been successful in this course and will have insights into future courses you will be taking. You will also have a TA who will be grading the lab reports. The TA will also read the weekly lab assignments and grade them.

Contact Information for Academic Issues

If you are experiencing, or have experienced, a problem with any of the above issues, email academicissues@iastate.edu

Free Expression

Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.