

Course Description

Digital technology has revolutionized our lives and has impacted how we carry out daily tasks. This course on digital systems will cover the foundations of digital technology from the gate level to the machine language level. Topics covered include: fundamentals of digital logic, computer arithmetic & Boolean algebra, basic components of digital circuits such as logic gates and flip-flops, information representation, Karnaugh map simplification, design of combinational and sequential circuits, Mealy and Moore models, finite state machine design, memory and programmable logic devices, CPU organization, arithmetic logic unit & control unit. Students will get their first taste of computer hardware and *machine dependent* programming. Machine organization will be illustrated using the MIPS architecture.

Course Objectives and Learning Outcomes

The objectives of this course are to introduce the fundamentals of digital logic design and assembly language programming. At the end of this course, each student should: (i) understand the fundamentals of boolean algebra (ii) be able to design minimized combinational logic circuits using Karnaugh-map simplification (iii) understand how signed integers are represented in a digital system (iv) understand how addition and subtraction are performed in hardware (v) understand the basic building blocks used in digital system design, such as decoders, encoders, multiplexors, latches, flip-flops, and registers (vi) be able to design a combinational logic system incorporating the above mentioned building blocks (vii) be able to design a finite state machine, allowing a real world problem to be solved using hardware (viii) be able to write and debug a simple program in MIPS assembly language.

Course Information

Website: <http://www.cse.buffalo.edu/faculty/bina/cse241/spring2010>
Instructor: Bina Ramamurthy (bina@buffalo.edu)
Lecture Time: MWF: 1.00-1.50PM
Lecture Location: 109 Knox
Office: 127 Bell Hall
Office Hours: MW: 9.00-11.30AM
CSE 241 R 1 : 206 Baldy (REC Reg #: 232271 W 8:00 AM - 8:50 AM)
CSE 241 R 2 : 213 Norton (REC Reg #: 248144 T 3:00 PM - 3:50 PM)
CSE 241 R 3 : 143 Park (REC Reg #: 135342 W 2:00 PM - 2:50 PM)
CSE 241 R 4 : 206 Baldy (REC Reg #: 165075 R 9:00 AM - 9:50 AM)

Textbook and other material

The primary textbook for this course is: Digital Principles and Design by Donald Givonne McGraw-Hill Science/Engineering/Math; 1 edition, ISBN: 0072525037

Pre-requisites

You should have taken CSE116 Data Structures or an equivalent.

Grading Distribution

Grades will consist of the following components:

Component (Quantity)	Percentage
Attendance	10%
Homework (10/12)	50%
Exams (2)	20% + 20%

Letter grade guideline will be as follows: 95-100: A, 90-94.99: A-, 85-89.99: B+, 80-84.99: B, 75-79.99: B-, 70-74.99: C+, 65-69.99: C, 60-64.99: C-, 55-59.99: D+, 50-54.99: D, <50: F. I reserve the right to alter component weighting or provide a "curve" on an assignment as warranted.

NOTE : → COMPONENT PASS POLICY ← IN ORDER TO PASS THIS COURSE, YOU MUST HAVE PASSING WEIGHTED COMPONENT AVERAGES (WEIGHTED COMPONENT AVERAGES MUST BE GREATER THAN 49.99) THERE WILL BE TWO COMPONENTS THIS SEMESTER. COMPONENT 1 IS THE EXAM COMPONENT CONSISTING OF THE TWO EXAMS. COMPONENT 2 IS THE HOMEWORK COMPONENT.

Exams

There will be two exams one of which will be administered and graded before the resign date. Exam material will cover all lecture and reading assignments before the exam, as well as concepts from the homework assignments. Exams are closed book, closed notes, and closed neighbor.

Homework

There will be several homework assignments during the semester. These will be assigned during the lectures and will be turned in a week after it is assigned. This will be turned in during the recitation and will be

Attendance Policy

You are responsible for the contents of all lectures and recitations (your assigned section). If you know that you are going to miss a lecture or a recitation, have a reliable friend take notes for you. Of course, there is no excuse for missing due dates or exam days. We do, however, reserve the right to take attendance in both lecture and recitation. During lectures, we will be covering material from the textbook. We will also work out several of the problems from the text. Lecture will also consist of the exploration of several real world problems not covered in the book. You will be given a reading assignment at the end of each lecture for the next class.

Grading Policy

All assignments will be graded and returned in a timely manner. When an assignment is returned, you will have a period of one week to contest any portion of the grade. The TA who graded your assignment will be the first person to resolve a grading conflict. If the conflict cannot be resolved, the instructor will mediate the dispute. The judgment of the instructor will be final in all such cases. When contesting a grade, you must be able to demonstrate how your particular solution is correct. Also, when contesting a grade, the instructor or TA reserves the right to re-evaluate the entire lab or exam, not just the portion in dispute.

Incomplete Policy

We only grant incompletes in this course under the direst of circumstances. By definition, an incomplete is warranted if the student is capable of completing the course satisfactorily, but some traumatic event has interfered with their capability to finish within the timeframe of the semester. Incompletes are not designed as stalling tactic to defer a poor performance in a class.

Academic Integrity Policy

UB's definition of Academic Integrity in part is, "Students are responsible for the honest completion and representation of their work". It is required as part of this course that you read and understand the departmental academic integrity policy located at the following URL:

http://www.cse.buffalo.edu/undergrad/policy_academic.php

There is a very fine line separating conversation pertaining to concepts and academic dishonesty. You are allowed to converse about general concepts, but in no way are you allowed to share code or have one person do the work for others. You must abide by the UB and Departmental Academic Integrity policy at all times. Remember that items taken from the Internet are also covered by the academic integrity policy! If you are unsure if a particular action violates the academic integrity policy, assume that it does until you receive clarification from the instructor. If you are caught violating the academic integrity policy, you will minimally receive a ZERO in the course.

Students with Disabilities

If you have special needs due to a disability, you must be registered with the Office of Disability Services(ODS). If you are registered with ODS please let your instructors know about this so that they can make special arrangements for you.