



Computer Organization I

Course Overview:

CDA3100 is a core course intended for CS majors with a background in C/C++ programming. This course introduces fundamental concepts in digital logic design and computer organization. Assembly language programming is used to reinforce understanding of basic structures of a computer and of machine operation principles. Verilog programming is used to reinforce the understanding of hardware design principles.

Instructor:

Course Instructor: Dr. David A. Gaitros
Office: 105D Love
Phone: 644-5832
Office Hours: 1:00pm-3:00pm Tuesday and Thursday

Co-requisites:

COP3330 (Object Oriented Programming) MAD2104 (Discrete Math I) or permission of the instructor.

Attendance and Punctuality: Attendance is absolutely essential. The reading material and slides cover only a portion of the content of the class. Critical pieces that will be necessary for you to succeed in the class will only be presented in class. If you miss a class it is up to you to gain the notes from another classmate. I will not repeat lectures for those who miss them.

You are responsible for all material presented in class. Exams and due dates will be scheduled in advance. A grade of zero will be recorded for missed exams or pop quizzes and late assignments unless prior arrangements are made or the absence is excused. Assignments will be assessed a 10% penalty per day (24 hour period). Assignments will not be accepted after 10 days past the due date (100 point penalty). Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. The student will be given only the additional days that the absence was approved. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse.

1st Day Attendance:

Attendance will be taken during the first lecture of this class. Any student registered as of the first day of class that does not attend will be dropped from the course in accordance with FSU Policies.

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Required Text:

D. Patterson and J. Hennessy. *Computer Organization and Design: The Hardware/Software Interface. Fifth Edition.*

Course Objectives: A student who has completed this course with a passing grade should be able to:

- (1) Calculate various simple measures of computer performance.
- (2) For both integer and floating-point representations, encode a value in a specified number representation, decode the value from a specified number representation, and convert numbers between different representations.
- (3) Use algorithms to perform binary integer arithmetic operations, including addition, subtraction, multiplication, and division.
- (4) Write programs in MIPS assembly language consisting of one or more functions to perform tasks and determine the output of existing MIPS assembly code.
- (5) Encode MIPS instructions into the corresponding machine code representation and decode MIPS machine code instructions into MIPS assembly.
- (6) Design combinational logic, which may include decoders, multiplexors, and ALU units using basic logic gates.
- (7) Design sequential logic elements, which may include latches, flip-flops, and registers, and describe characteristics of larger memory elements.
- (8) Design finite state machines, including drawing state diagrams and determining next state functions, and implementing finite state machines using basic logic elements.
- (9) Enhance the data path and control for a simple single cycle processor that uses basic elements such as combinational logic and state elements to provide additional functionality.
- (10) Use the Verilog programming language to describe simple circuits.
- (11) Enhance the control for a simple multi-cycle processor that uses basic control techniques such as a state machine or microcode to provide additional functionality.
- (12) Describe the limitations of single cycle. Slides: There is a lot of material to cover in this class. Lecturing from slides will allow me to cover the material at a more rapid pace. I will be presenting slides that I have developed and slides of figures and tables from the text. Pdf for the slides I have developed for the class will be made available from the class homepage prior to their presentation.

Assignments: There will be 9 assignments including projects using the MIPS assembly and Verilog.

Grading:

Grades will be based upon the points earned on the exams, assignments and quizzes. Keep all graded material to provide evidence of grades.

Graded Material Weights

<u>Graded Work</u>	<u>Weight</u>
Midterm Exam	30%
Final Exam	30%
Homework/Quizzes	40%

Note: Any quizzes given will be incorporated into the Exam Grades.

Grade Assignment Table

<u>Graded</u>	<u>Lower Bound Percentage</u>
A	94.00%
A-	90.00%
B+	87.00%
B	84.00%
B-	80.00%
C+	77.00%
C	74.00%
C-	70.00%
D	60.00%
F	0.00%

Note: The percentage of points used to determine your final grade will be rounded to two decimal places.

Course Communication:

All published course materials are available on the Blackboard Site (<http://campus.fsu.edu>) . There you will find this syllabus, lecture materials, help files, homework assignments, and other materials available to the students. Announcements to students will be posted on the Blackboard site and emailed to all users including Teaching Assistants. The instructor of this course will use your FSUID (email account) to communicate. Be sure to read your email from this account every day or have it forwarded to an account that you review on a daily basis.

Exam Makeup Policy:

An exam missed without an acceptable excuse will be recorded as a grade of zero (0). The following are the only acceptable excuses:

- If submitted *prior to* the scheduled exam: Evidence from a University official that you will miss the exam due to University sanctioned travel or extracurricular activity
- A note from a physician, University dean, or parent indicating an illness or other extraordinary circumstance that prevented you from taking the exam
- An emergency of unexpected origin

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All excuses must be submitted in writing, must be signed by the excusing authority, and must include complete contact information for the authority, including telephone numbers and address.

Missed exams with acceptable excuse will be made up.

Missed, and acceptably excused, final exams will result in the course grade of 'T' and must be made up in the first two weeks of the following semester.

Grade of 'T' Policy:

The grade of 'T' is given to a student who, for circumstances beyond their control, missed the opportunity to cover course materials. Under the conditions stated by the University, the grade of 'T' means that a student is allowed the next semester of their enrollment to make up all remaining course materials. It does not allow a student the opportunity to hand in additional work or improve their grade on previous assignments. The grade of 'T' will be assigned only under the following exceptional circumstances:

- The final exam is missed with an accepted excuse for the absence. In this case, the final exam must be made up during the first two weeks of the following semester.
- Due to an extended illness or other extraordinary circumstance, with appropriate documentation, the student is unable to participate in class for an extended period. In this case, arrangements must be made to make up the missed portion of the course prior to the end of the next semester.

Class Behavior: Students are expected to refrain from carrying on side conversations or other distracting behavior in class, and that violations of this policy will result in expulsion from the classroom.

Communication

Success in the course depends heavily on students checking email and announcements posted on the class Web site. Most communication between teacher and student occurs online. Students are expected to check email, and announcements on the class Web site daily Monday - Friday. The class agenda and grade book should be checked at least once a week to stay current on what needs to be done and what has been graded. Failure to do so may result in missed opportunities and poor grades.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://dof.fsu.edu/honorpolicy.htm>.)

Cheating

All assignments must be original work. We consider it cheating when a student starts an assignment from some other student's assignment file, or copies portion of another student's file.

- Cheating Penalties :
 - o First Offense: All students involved will be given the option of accepting a zero for the assignment and a reduction of ½ letter grade in the class or having the case submitted to the Academic Honor court for review.
 - o Second Offense: The case will be submitted to the Academic Honor court for review.

There are no innocent participants in cheating incidents. Students who leave their assignment work available for others to access either on a private or public computer, intentionally or accidentally, will be considered accomplices to cheating should someone else use their work and submit it as their own.

- Assignments are designed in a manner that requires every student's files to contain unique and different code. If two or more students submit work with the same, or portions of the same identical code, and/or if file properties are the same, it is evidence that cheating has taken place.
- Two or more students working together on an assignment is considered cheating. An assignment submission is intended to be a measure of one student's ability.
- Be warned! Special software will be used that compares every electronically submitted assignment files to all other submitted files to determine if the file was copied from another student.
- Sometimes cheating is not detected until after students have submitted several copied assignments. In such cases the first copied assignment is considered the first offense, the second copied assignment, the second offense, and so on.

Americans with Disabilities Act

Students with disabilities needing academic accommodation should:

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- (1) register with and provide documentation to the Student Disability Resource Center; and**
- (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.**

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

**Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
<http://www.disabilitycenter.fsu.edu/>**

Syllabus Changes

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.