

MIDWESTERN STATE UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

CMPS 3023: Logic Design
Spring semester 2019

Instructor Dr. Nelson L. Passos
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Office Hours: TR 9:30 – noon, 3:30 – 4:00 pm
WF 9:00 - 11:00 am
Class Hours: MWF 8:00 - BO 320

Course Description:

Study of topics related to the design of modern microprocessors, including Boolean algebra, logic gates, design simplification techniques, memory design, programmable control units, and use of hardware description languages.

Prerequisites:

Minimum grade of C in CMPS 2084

Text book:

Digital Design and Computer Architecture, by David Harris and Sarah Harris or
Digital Logic and Microprocessor Design with Interfacing, by Enoch Hwang, 2nd ed.

Grading:

Tests and Final Exam:	20 %
Assignments:	20 %
Project:	15 %
Class Participation:	5 %

Final grading letter:

90 to 100 pts = A, 80 to 89.99 pts = B, 70 to 79.99 pts = C, 60 to 69.99 pts = D, other = F

Additional and important information:

All students should refer to the current MSU Students Handbook and Activities Calendar for university policies related to class attendance, academic dishonesty, students responsibilities, rights and activities.

Disability needs: Inform the instructor if you are a student with a disability and need accommodations for this class.

Cell phones, etc.: Use of any electronic device is not allowed in the classroom. Exceptions must be approved by the instructor.

Student drops: If you wish to drop this course you must first contact your instructor. All students-initiated drops must be processed by **March 25, 2019**.

Attendance: **Students are expected to attend all meetings of the classes in which they are enrolled.** Attendance is rewarded by the participation points in the grading criteria.

Campus Carry: Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at <https://mwsu.edu/campus-carry/rules-policies>.

Assignments: Assignments will be made as scheduled and are expected to be completed by the specified due date. Grades will be given to the assignments handed in on time. Late assignments will be accepted until one class past the due date, however will have their maximum grade reduced by twenty points. Any assignment turned in after that period or not done will be graded zero points. Students in this course must demonstrate their competency in fundamentals math skills through homework assignments and tests.

Assistance: Please contact your instructor for extra help during this course. This includes class material clarification, expected absences from class due to any personal problem, etc.

Academic Honesty: The Department of Computer Science had adopted the following policy related to cheating (academic misconduct). The policy will be applied to all instances of cheating on assignments and exams as determined by the instructor of the course.

- 1st instance of cheating in a course: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam. In addition, the student will receive a one-letter grade reduction in course.
- 2nd instance of cheating in a course: The student will receive a grade of F in course & immediately be removed from course.

All instances of cheating will be reported to the Department Chair and, in the case of graduate students, to the Department Graduate Coordinator.

Testing Process

The Department of Computer Science has adopted the following policy related to testing:

- All bags, purses, electronics (turned off), books, etc. will be placed in the front of the room during exams, or in an area designated by the instructor.
- Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.
- No student is allowed to leave the room during an exam and return

RECORDING OF CLASS LECTURES: Permission must be requested in writing & obtained from the instructor before recording of class lectures. If permission is granted, the recording may only be used by the student making the recording. Recordings may NOT be posted on any internet source without written permission of the instructor. Failure to adhere to the policy may result in removal from the course with a grade of F or other appropriate punishment.

Grades will be posted on D2L! Grading system will be discussed in class.

Tentative agenda:

Jan	14-	Introduction
Jan	16-	Binary numbers and data representation - a review
Jan	18-	Binary numbers and data representation - a review
Jan	21-	Martin Luther King Break
Jan	23-	Floating point
Jan	25-	Transistors and logic circuits
Jan	28-	Switching functions (AND, OR, NOT, NAND, NOR)
Jan	30-	Switching functions (AND, OR, NOT, NAND, NOR)
Feb	1-	Sum of products/product of sums Assignment # 1
Feb	4-	Boolean algebra
Feb	6-	Boolean algebra - simplification
Feb	8-	Logic to gates Assignment # 2
Feb	11-	Don't cares
Feb	13-	Karnaugh maps - introduction
Feb	15-	Karnaugh maps - examples Assignment # 3
Feb	18-	Quine-McCluskey method
Feb	20-	Multiplexers
Feb	22-	Decoders
Feb	25-	HDL
Feb	27-	Timing
Mar	1-	Test # 1
Mar	4-	Sequential circuits - latches
Mar	6-	RS Flip-flops
Mar	8-	D Flip-flops
Mar	11-	Sequential logic design
Mar	13-	Finite state machine
Mar	15-	Finite state machine implementation Assignment # 4
Mar	18	Spring Break
Mar	20	Spring Break
Mar	22	Spring Break
Mar	25-	Mealy and Moore Finite state machines
Mar	27-	Simplifying a finite state machine
Mar	29-	HDL for sequential circuits - process Assignment # 5, Project assignment
Apr	1-	HDL examples
Apr	3-	Introduction to Quartus
Apr	5-	Quartus simulation tool Assignment # 6
Apr	8-	Simplifying FSMs
Apr	10-	FF timing considerations
Apr	12-	Clock skew
Apr	15-	Parallelism
Apr	17-	Parallelism
Apr	19-	Easter Holiday
Apr	22-	Parallelism
Apr	24-	Memory
Apr	26-	Test # 2
Apr	29-	Test review
May	1-	Microcontrollers
May	3-	Microcontrollers implementation
May	8-	Finals (Wednesday, 8:00 am)