MIDWESTERN STATE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
CMPS 2084: Introduction to Computer Architecture
Spring semester 2023

Instructor:	Dr. Nelson L. Passos
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Office Hours:	T 2:00 - 4:00 pm
	TR 9:30 - 11:30 am
	MW 9:00 - 12:00 noon
Class Hours:	TR 8:00 - BO 100 W 1:00-3:00/3:00-5:00 pm - BO 109 (lab)

Course Description:
Study of the functions and logical relationships of digital computer components, including the central processing unit, different levels of memory, control signals, bus systems, data channels, input/output devices, instruction set architecture and Assembly programming language. Also discussed are memory addressing techniques, data representation and more advanced topics as pipelined, superscalar, and RISC processors.

Prerequisites:
Minimum grade of C in CMPS 1044

Extra Credit online Textbook:
1. Sign in or create an account at learn.zybooks.com (or get it from bookstore)
2. Enter zyBook code **MWSUCMPS2084PassosSpring2023**
3. Subscribe

Text book (recommended):
Computer Organization and Architecture, by Stallings (8th, 9th, 10th or 11th edition).

Grading:

Tests and Final Exam	20 % (each, include lecture and lab material)
Homework Assignments	10 %
Lab Assignments	10 %
Mini Projects	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 27, 2023.**
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 on Campus Carry at https://msutexas.edu/police/policies-laws/index.php. If you have questions or concerns, please contact Interim MSU Chief of Police at steven.callarman@msutexas.edu.

Active Shooter: The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit Safety / Emergency Procedures. Students are encouraged to watch the video entitled "Run. Hide. Fight." which may be electronically accessed via the University police department's webpage: "Run. Hide. Fight."

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 the beginning of the next 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 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. The MCOSME website provides information on the process for grade appeals or appeals of academic honesty sanctions. The Grade Appeal Checklist provides the timeline for appealing from the instructor to the next in line (dean of the college). The Academic Honesty Checklist describes the timeline for appealing from the instructor to the next in line (chair of department).

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

Midterm Progress Report: In order to help students to keep track of their progress toward course objectives, the instructor for this class will provide a Midterm Progress Report through each student's WebWorld account. Midterm grades will not be reported on the students' transcript; nor will they be calculated in the cumulative GPA. They simply give students an idea of where they stand. Students earning below a C at the midway point should schedule a meeting with their instructor.

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.

Grading system will be discussed in class.

Tentative agenda:

Jan 17-	Introduction – binary numbers
Jan 18-	**LAB 1 –** C++ programming
Jan 19-	Number systems - conversion
Jan 24-	Negative numbers
Jan 25-	**LAB 2 –** Number systems
Jan 26-	Negative numbers
Jan 31-	Fractions – hexadecimal system
Feb 1-	**LAB 3 -** Negative numbers
Feb 2-	Computer architecture basics, pipeline, cache
Feb 7-	Computer evolution
Feb 8-	**LAB 4 –** CPU registers, debug
Feb 9-	Computer performance, families
	Homework Assignment # 1
Feb 14-	Instruction set overview
Feb 15-	**LAB 5 –** Assembly programming
Feb 16-	Addressing modes
	Homework Assignment # 2
Feb 21-	Arithmetic and branch instructions
Feb 22-	**LAB 6 -** Conditional jumps
Feb 23-	ARM/Intel instructions, Logical operations and decisions
	Homework Assignment # 3
Feb 28-	Procedures
Mar 1-	**LAB 6a -** review
Mar 2-	**Test # 1**
Mar 7-	Compilation and execution
Mar 8-	**LAB 7 -** Procedures
Mar 9-	Instruction cycle, Interrupts
Mar 14-	**Spring break**
to 16-	**Spring break**
Mar 21-	Introduction to memory/storage
Mar 22-	**LAB 8 -** Procedures and stacks
Mar 23-	Disk technology
	Homework Assignment # 4
Mar 28-	RAID
Mar 29-	**LAB 9 -** Boolean operations
Mar 30-	Other storage devices
Apr 4-	Cache memory - address mapping
Apr 5-	**LAB 10 -** Bit manipulation
Apr 6-	**Easter break**
Apr 11-	Associative mapping
Apr 12-	**LAB 11a -** Arrays and strings
Apr 13-	Write policies – Replacement algorithms
	Homework Assignment # 5
Apr 18-	Error correction introduction
Apr 19-	**LAB 11b -** Arrays and strings
Apr 20-	Error correction Hamming code
Apr 25-	Memory management
Apr 26-	**LAB 11c -** review
Apr 27-	**Test # 2**
May 2-	Paging
May 3-	**LAB 11d- f**inal review
May 4-	Translation Lookaside Buffer
May11-	**Finals (Thursday, 8:00 am)**