MIDWESTERN STATE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
CMPS 2084: Introduction to Computer Architecture
Fall semester 2025

Instructor:	Dr. Nelson L. Passos	
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Office Hours:	MW 10:00 - 11:30 am	
	TR 9:30 - 12:00 pm	
	R 1:00 - 4:00 pm	
Class Hours:	TR 12:30 – BO 144	W 1:00-3:00 pm - BO 103 (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

Text book (recommended):
Computer Organization and Architecture, by Stallings (8^{th}, 9^{th}, 10^{th} or 11^{th} 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 **November 24, 2025.**
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: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit Campus Carry.

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 one class past the due date (except for online assignments), 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 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:

Aug 26-	Introduction – binary numbers
Aug 27-	**LAB 1 –** C++ programming
Aug 28-	Number systems - conversion
Sep 2-	Negative numbers – sign magnitude
Sep 3-	**LAB 2 –** Number systems
Sep 4-	Negative numbers – two's complement
Sep 9-	Fractions – hexadecimal system
Sep 10-	**LAB 3 -** Negative numbers
Sep 11-	Computer architecture basics, pipeline, cache Homework Assignment # 1
Sep 16-	Computer evolution
Sep 17-	**LAB 4 –** CPU registers, debug
Sep 18-	Computer performance, families Homework Assignment # 2
Sep 23-	Instruction set overview
Sep 24-	**LAB 5 –** Assembly programming
Sep 25-	ARM/Intel instructions
Sep 30-	Arithmetic and branch instructions
Oct 1-	**LAB 5a -** test review
Oct 2-	**Test # 1**
Oct 7-	Intel example – parallel port
Oct 8-	**LAB 6 -** Conditional jumps
Oct 9-	Addressing modes Homework Assignment # 3
Oct 14-	Instruction cycle, Interrupts
Oct 15-	**LAB 7 -** Procedures
Oct 16-	Introduction to memory/storage
Oct 21-	Cache memory, address mapping
Oct 22-	**LAB 8** - Procedures and stacks
Oct 23-	Direct mapping Homework Assignment # 4
Oct 28-	Associative mapping
Oct 29-	**LAB 9 -** Boolean operations
Oct 30-	Write policies – Replacement algorithms
Nov 4-	Error correction introduction
Nov 5-	**LAB 10 -** Bit manipulation
Nov 6-	Error correction Hamming code Homework Assignment # 5
Nov 11-	Disk technology/Optical storage
Nov 12-	**LAB 11 -** Arrays and strings
Nov 13-	RAID
Nov 18-	Memory management
Nov 19-	**LAB 11a –** test review
Nov 20-	**Test # 2**
Nov 25-	Paging
Nov 26-	**Thanksgiving break**
Nov 27-	**Thanksgiving break**
Dec 2-	Segmentation
Dec 3-	**LAB 11b-** final review
Dec 4-	Translation Lookaside Buffer
Dec 11-	**Finals (Thursday, 10:30 am)**