

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

Spring semester 2025

Instructor: Dr. Nelson L. Passos
Office: Pierce Hall 145
Office phone: 397-4129
E-mail: nelson.passos@msutexas.edu
Office Hours: MW 8:30 - 10:00, 11:00 - noon
TR 9:30 - 11:30 am
W 1:00 - 4:00 pm
Class Hours: MWF 10:00 - DB 342 T 1:00-3:00/3:00-5:00 pm - DB 335 (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

Textbook (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.

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. If a student is absent more than 3 classes without a documented excuse and is not performing well in class, a report will be submitted to the Dean of Students and the student may be dropped from the class. Classes will not be streamed for absent students, whether it is excused or not.

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 fundamental math skills through assignments and tests.

Student drops: If you wish to drop this course you must first contact your instructor. All students-initiated drops must be processed by **April 30, 2025**.

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.

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.

Policy on Concealed Handguns on Campus: 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 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 <https://msutexas.edu/police/safety/index.php#active-shooter>. Students are encouraged to watch the video entitled "Run. Hide. Fight." which may be electronically accessed via the University police department's webpage.

Academic Misconduct Policy & Procedures:

Academic misconduct is cheating, collusion, and plagiarism: it is the act of using either published or unpublished source material of other students, persons, or generative AI (unless there are instructions that allow it), and must follow accepted techniques of crediting. The Department of Computer Science has adopted the following policy related to academic misconduct. The policy will be applied to all submission of work for credit as determined by the instructor of the course, e.g., assignments, quizzes and exams. (See below for link to MSU definitions.)

- 1st instance of cheating in the program: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam. If the final grade in the course, does not result in a one letter grade reduction, the student will receive a one letter grade reduction in course.
- Further instances of cheating in any course within the program: The student will receive a grade of F in the course & be removed from the course.
- All instances of cheating will be reported to the Department Chair, the MCOSME Dean, the Dean of Graduate Students, if a graduate student, and the Office of Rights and Responsibilities, who may decide at their own discretion to impose a stiffer sanction based on knowledge of other instances of cheating at MSU Texas.

Note: Letting a student look at your work is collusion and is academic misconduct!

See Also: MSU Student Handbook: Academic Dishonesty Policy & Procedures

https://msutexas.edu/student-life/_assets/files/handbook.pdf.

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).

Grading system will be discussed in class.

Tentative agenda:

In the event that campus is closed due to weather on a date when an exam is scheduled or a homework assignment is due, the exam date or homework assignment due date will shift to the next class period when campus is back open. In a regular class day, login to D2I for further instructions (online class or some other activity may be assigned)

Jan 20-	Martin Luther King Holiday
Jan 21-	LAB
Jan 22-	Introduction – binary numbers
Jan 24-	Number systems - conversion
Jan 27-	Negative numbers
Jan 28-	LAB 1 – Number systems
Jan 29-	Negative numbers – two’s complement
Jan 31-	Fractions
Feb 3-	Hexadecimal system – character representation
Feb 4-	LAB 2 – Negative numbers
Feb 5-	Word addressing and other observations
Feb 7-	Computer architecture basics Homework Assignment # 1
Feb 10-	Computer architecture basics, pipeline, cache
Feb 11-	LAB 3 – CPU registers, debug
Feb 12-	Computer evolution
Feb 14-	Computer performance, families Homework Assignment # 2
Feb 17-	Compilation and execution
Feb 18-	LAB 4 – Assembly programming
Feb 19-	Instruction set overview
Feb 21-	ARM/Intel instructions, Logical operations and decisions Homework Assignment # 3
Feb 24-	Example parallel port
Feb 25-	LAB 5 – Conditional jumps
Feb 26-	Arithmetic instructions
Feb 28-	Logical instructions
Mar 3-	Procedures
Mar 4-	LAB 5a - review
Mar 5-	Test # 1
Mar 7-	Addressing modes
Mar 10- 15	Spring break
Mar 17-	Addressing modes
Mar 18-	LAB 6 - Procedures
Mar 19-	Instruction cycle
Mar 21-	Interrupts
Mar 24-	Introduction to memory/storage
Mar 25-	LAB 7 – Procedures and stack
Mar 26-	Introduction to cache memory
Mar 28-	Cache memory examples Homework Assignment # 4
Mar 31-	Direct mapping
Apr 1-	LAB 8 - Boolean operations
Apr 2-	Associative mapping
Apr 4-	Write policies
Apr 7-	Replacement algorithms
Apr 8-	LAB 9 - Bit manipulation
Apr 9-	Introduction to error correction
Apr 11-	Error correction Hamming code Homework Assignment # 5

Apr 14- Error correction examples
Apr 15- **LAB 10** - Arrays and strings
Apr 16-18- **Easter Break**
Apr 21- Disk technology
Apr 22- **LAB 10** - test review
Apr 23- **Test # 2**
Apr 25- RAID
Apr 28- Optical storage
Apr 29- **LAB 11 – Programming**
Apr 30- Memory management
May 2- Paging
May 5- Paging examples
May 6- **LAB 11a – final review**
May 7- Segmentation
May 9- Translation Lookaside Buffer
May 14- **Finals (Wednesday, 10:30 am)**