Midwestern State University
Department of Computer Science
Fall 2019

Course Information
Course syllabus: Advanced Computer Architecture.
Course number: CMPS 5133.
Course Section: 101.
Class hours: 2:00 pm to 3:20 pm, Tuesday and Thursdays.
Class room: Bolin 312.

Instructor Information
Instructor's Name: Doctor Eduardo Colmenares.
Instructor's office: Bolin Hall, office 126C.
Instructor's email: eduardo.colmenares@msutexas.edu

Office Hours

Monday	9:00 – 10:00 am
Tuesday	1:00 – 2:00 pm
Wednesday	9:00 – 11:00 am
Thursday	10:00 – 11:00 am
Friday	No Office Hours

Course Description
A study of the organization and interconnection of components of computer system. Emphasis is given to the study of the instruction set and performance analysis of different computer architectures. Also included is the study of pipeline, overlap processing, memory management, virtual memory, superscalar, parallel many and multicore architectures.

Textbook
Is the textbook required? The answer is yes.
Textbook name: Computer Organization & Architecture: Designing for performance
Textbook edition: The most recent one.
Textbook Author: William Stallings.
Publisher: Prentice Hall.

Additional References (Not Required)
- Modern Processor Design. By J.P. Shen and M.H. Lipasti (1st Edition)
- Computer Architecture a quantitative Approach – by John Hennessy and David Patterson. Publisher: Morgan Kaufmann.

Grading Policy
89 to 100 points is an A.
79 to 88.99 points is a B.
69 to 78.99 points is a C.
59 to 68.99 points is a D.
0 to 58.99 points is an F.

Evaluation Process Summary Table

Category	Percentage
Two Tests	40%
Final Exam	20%
Five Assignments	25%
Attendance	5%
Participation (Quizzes)	10%

Evaluation Process

The final grade for this course will be based on participation, home, project, attendance and exams. A description is provided next

- You will have two tests and one final exam, each one of the tests is worth 20 points. Your final exam is worth 20 points. All the tests including the final exam will count for sixty percent of your final your grade.
- You will have several programming assignments or also known as homework. All your programming assignments will count for twenty five percent of final your grade. Your homework is classified in two different subcategories as follows
    - Take Home Homeworks (THH), these are traditional homework and you will be given plenty of time to work on them and successfully complete them.
    - In Class Homeworks (ICH), these type homework will be announced ahead of time in order to allow the students to prepare all the necessary hardware and software needed for its successful in class completion.
- The next category is attendance. Attendance will count for five percent of your final grade.
- The last category is participation, and this will count for ten percent of your final grade. Please be aware that this category includes in class activities and quizzes. Next you will find additional information about this category.
    - Assignments given in class, also known as in class activities will be unannounced in nature.
    - Quizzes will be non-pop-up quizzes.
    - No makeup participation assignments are given.
    - Arriving late, leaving early to class voids the right to take a quiz or in class activity if it already started or it is about to start.

Laptop Policy

For this class, you are not required to buy a laptop. However, if the instructor announces an (In Class Homework (ICH) or In Class Activity (ICA), then you are responsible for the following:

- Bringing a laptop with all necessary programs properly installed, configured a tested.
- Bringing the laptop's charger: If you do not bring your charger and cannot complete the assignment(s) because your battery died, then your grade will not be a good one.
- Make sure that you have a fully working and in-classroom tested Wi-Fi capabilities. If you cannot submit your homework because your Wi-Fi does not work, then your grade will not be a good one.

Attendance

Attendance is a component of the course grade (five percent). Each student will have one unexcused absence. Each student will begin with 100 points for their attendance grade. For each additional unexcused absence, 20 points will be subtracted from the attendance grade.

Please let your instructor know if you are going to miss a class for academically related extracurricular activities. If this is the case you must present the sponsoring university member's written justification before your absence occurs.

Tests

Tests are comprehensive in nature. No make-up exams will be given, except for the following cases:

1. Surgery, Medical Emergency, Death in the family, Presentation at a Conference, some others as determined by the instructor.
    a. If you miss an exam, you will receive a permanent zero unless you notify the instructor and demonstrate with the proper official documentation that an emergency that you could not circumvent existed. This documentation must be presented not later than 24 hours after the test.
    b. Students who miss an exam due to University business should notify the instructor in advance, and present the sponsoring university member's written justification.

If you do miss an exam and you fall in one of the categories above, this means that you have a properly documented case. Your instructor will proceed to assign a temporary grade of zero which will be substituted for your excused test grade (Final Exam). However, this substitution can only be performed once during the semester. Exams are uniquely composed for each term.

Final Exam

There is no make-up final exam. The final exam will take place in our regular classroom. It is the student's responsibility to keep track of the designated date, time. A complete list of all MSU exams (by time) can be found at Final Exam Schedule.
Final exam Date is Thursday December 12, 2019.
Final exam time goes from 1:00 pm to 3:00 pm.

Late Policy & Deadlines

- Submitted work is due when specified, as specified (format) by the instructor. It is in the student's best interest to keep track of all deadlines.
- The instructor is not required to remind students of ANY date and/or deadline associated with tests, homework, reports, project assignment, etc.
- Assignments submitted to the instructor's email will be considered invalid, even if submitted before the deadline. Assignments MUST be submitted to the corresponding dropbox via D2L.
- Late assignments will not be accepted.
- Very Important: Before you submit any file, take your time and double OR triple check that
    a. You are uploading the correct and ALL necessary files
    b. Your work is correct at the best of your abilities
    c. Failure to fulfill (1) and (2) ON TIME, WILL NOT excuse you from a bad grade.

- What does it mean to be late?
  Answer: for example, if your assignment is due today at 8:00 am and you deliver your report by 8:00:01 am (1 second late) then it will be considered late. There will not be exemptions of any kind.

Additional Grade Policy
Once the grades, have been either returned to the students, or published via D2L, the student will have one week to examine them, and check for inconsistencies, errors, etc. After the 1-week window of opportunity all grades will become PERMANENT and WILL NOT change. It is not only the student's responsibility to check the accuracy of his/her grades, but also in his/her best interest to do it.
This rule DOES NOT apply to the final exam because the final is exam triple checked by the instructor before publishing the grade.

Important Information about our grading policy
The instructor reserves the right to adjust the grade distributions for the whole class. What does it mean? It means that grade distributions will not be adjusted on an individual basis.

Departmental Cheating Policy and Ethical Conduct
Policy on 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. (See below for link to MSU definitions.)

- 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.

Policy on Testing Process
The Department of Computer Science has adopted the following policy related to testing.

1. 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.
2. Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.
3. No student is allowed to leave the room during an exam and return. Be prepared to remain in the classroom for the entire duration of the test.

Classroom Civility
All violations of classroom civility will be reported to the Dean of Students. Students are expected to assist in maintaining a classroom environment that is conducive to learning." In order to ensure that all students gain from time spent in class, students are prohibited from engaging in any form of distraction, e.g. leaving the room for extended periods of time, reading newspapers (or other articles), working on other courses, and using cell-phones or laptops for calls or messages. If you indulge in any such inappropriate behavior (without explicit consent of the instructor), you will (at the very least) be asked to leave the classroom. MSU Dean of Students Website.

Student with Disabilities
Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from disability support office during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Disability Support Office has been provided. For additional information you may contact the Disability Support Office in Clark Student Center 168 - Phone: (940) 397-4140.
Disability Support Services Website.

Dean of Students
The Dean of Students can assist in notifying the campus community of student illnesses, immediate family deaths and/or student death. Generally, in cases of student illness or immediate family deaths, the notification to the appropriate campus community members occur when a student is absent from class for four consecutive days with appropriate verification. It is the student's responsibility for missed class assignments and/or course work during their absence. MSU Dean of Students Website.

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.

University's 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 Campus Carry.

Tentative Agenda
The instructor reserves the right to add, remove, reorder topics as he considered convenient towards the benefit of the class. By the end of the semester you will have a very good understanding of the following topics.

1. Syllabus, Floating point numbers, IEEE 754
2. Instruction Sets: Types of {Operands and Operations}
3. Instruction Sets: {Addressing Modes and Formats}
4. (RISC vs CISC) & (Processor Organization)
5. (Register Organization) & (Instruction Cycle)
6. Pipelining Introduction and Fundamentals
7. Pipeline Hazards P1
8. Pipeline Hazards P2
9. Cache memories Intro, write policies
10. Memory Management
11. Memory Management
12. MM-Virtual Memory

13. VM-Page Tables
14. Page Tables
15. TEST #1
16. Input/Output Systems
17. Instruction Level Parallelism
18. Superscalar
19. Branch prediction
20. Data Dependencies
21. Tomasulo Algorithm
22. Posix Threads
23. Parallel processing, SIMD instructions, Heterogenous Multicore Processors
24. Cell Processor, GPU Architecture
25. TEST # 2
26. Contemporary architectures
27. GPU Architecture
28. GPU Architecture, Programming
29. GPU Programming
30. GPU Programming