CSCI 540, 01E

Computer Architecture

COURSE SYLLABUS: Fall 2022

INSTRUCTOR INFORMATION

Instructor: Derek Harter, Ph.D., Professor
Office Location: Science 355
Office Hours: T, Th 8 - 11 am
Class Meetings: W 7:20pm – 10:00pm Jour 110
University Email Address: Derek.Harter@tamuc.edu

Preferred Form of Communication**:** e-mail (Please indicate the course number in the subject line)

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Required:

Computer Organization and Architecture, 11th Edition, William Stallings, ISBN-13: 9780134997193 (any edition newer than 8th or 9th should be fine for the required readings).

Recommended:

Computer Systems Design and Architecture, 2nd edition, Vincent P. Heuring and Harry F. Jordan, ISBN:0-13-048440-7

Software Required

D2L access, Word or PDF creation software

Course Description

The *syllabus/schedule are subject to change.*

Introduction to current high level computing machines in both hardware and software design. Topics include the design decisions involved in the development of computer architectures, hardware organizations needed to implement various instructions sets, and future trends in computer architectures.
Prerequisite: CSci 516 (Assembly Language)

Student Learning Outcomes

1. Students shall be able to identify general purpose machines from different views, and classify computers and their instructions.
2. Students shall be able to identify cost and performance of a computer, evaluation metrics, Amdahl's law, principle of locality, and benchmarks.
3. Students shall be able to identify cache and memory organization, cache mapping and replacement strategies, and virtual memory.
4. Students shall be able to identify Pipelining techniques, and pipelining performance issues, hazards and solutions.
5. Students shall be able to use I/O system technology: hard drive, RAID technology, I/O performance and benchmarks.
6. Students shall be able to articulate a comprehensive view of architecture and performance for real-world computers.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Familiarity with word processing, familiarity with online D2L coursemanagement system, HLL Programming (C++, Matlab), Assembly programming (not a specific assembly language, but how to code in it!)

Instructional Methods

All materials, assignments and tests will be conducted through the D2L MyLeo Online learning system. The course will consist of weekly readings and quizes on the readings. Longer assignments will be assigned covering topics for the course. More comprehensive midterm and final exams will be given over the course materials.

Student Responsibilities or Tips for Success in the Course

To plan a minimum of three hours of outside preparation for each hour of class is a safe time allocation for successfully completing the course.

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%

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B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

Assignments: There will be regularly assigned homework problems and programming problems. Assignments will be given and returned via the online MyLeo Online (D2L) system as a convenience to the students and the instructor. In general, we will probably have 1 written assignment (problem set) and/or 1 programming assignment for each of the major parts of the course. It is very important that students follow the instructions carefully on the assignments. It is the student's responsibility to have all assignments ready on time by the given due date. Late assignment may not be accepted or may be penalized and assignment may not be accepted beyond a certain time. Important material from the text and outside sources will be covered in class. Students should plan to take careful notes as not all material can be found in the texts or readings. Discussion is encouraged as student-procured outside material relevant to topics being covered. End of chapter activities and online activities may be assigned to reinforce material in the text.

Assessments

Quizzes / Participation:	20%
Assignments:	40%
Midterm Exam:	20%
Final Exam:	20%

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

The *syllabus/schedule are subject to change.*

https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Please use e-mail and through the MyLeoOnline course to ask questions and for help, and to set up additional appointments if needed. We may use some of the MyLeoOnline virtual classroom tools this semester for online class feedback sessions.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

There will be no make up or extra credit for late assignments. You must turn in all assignments by the require due date, or notify the instructor with a valid reason for missing an assignment.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

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COURSE OUTLINE / CALENDAR (Tentative)

Unit	Content	Reading
Part 1	**Introduction**	
U1	Basic Concepts and Computer Evolution, Number Systems	Syllabus, Ch 1, Ch 10
U2	Performance Concepts	Ch 2
Part 2	**The Computer System**	
U3	Computer Function and Interconnection	Ch 3
U4	Memory Hierarchy: Locality and Performance	Ch 4
U5	Cache Memory	Ch 5
U6	Internal Memory, External Memory	Ch 6, Ch 7
U7	Input/Output, Operating System Support	Ch 8, Ch 9
T1	Midterm Exam	-
Part 3	**Arithmetic and Logic**	
U8	Computer Arithmetic	Ch 11
U9	Digital Logic	Ch 12
Part 4	**Instruction Sets and Assembly Language**	
U10	Instruction Sets	Ch 13, Ch 14
U11	Assembly Language	Ch 15
Part 5	**The Central Processing Unit**	
U12	Processor Structure and Function	Ch 16
U13	RISC	Ch 17
U14	Instruction-Level Parallelism and Superscalar Processors, Control Unit Operation	Ch 18, 19
T2	Final Exam	–

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