CSCI 450-01W, 23254 Computer Architecture

COURSE SYLLABUS: Spring 2020

INSTRUCTOR INFORMATION

Instructor: Dr. Tanik, Assistant Professor
Office Location: 210A
Office Hours: W 430-720pm, Th 1245-145pm, 430-6pm, M-F 11-7pm by appt
Office Phone: 903-886-5419
University Email Address: John.Tanik@tamuc.edu
Preferred Form of Communication: email
Communication Response Time: 1 day

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Recommended (Free pdf online): Computer Architecture, a Quantitative Approach, 5th edition, Hennessy and Patterson
http://uni-site.ir/khuelec/wp-content/uploads/Computer-Architecture-A-Quantitative-Approach.pdf

Modern Cloud Architecture (Free pdf docs on AWS well architected framework)
https://aws.amazon.com/architecture/well-architected/

Software Required: MS office including MS Word/Powerpoint/Project/Visio and IHMC Cmaptools, along with other free tools provided.

Course Description

This course offers a comprehensive coverage of computer architecture and the internals of computer systems. Topics include Computer system performance metrics and analysis, instruction set design, CPU organization (datapath and control, out-of-order execution, register renaming, branch handling techniques, supporting precise interrupts

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in out-of-order pipelines, superscalar processors), Memory systems (caches, virtual memory, TLBs, multi-level cache hierarchies), Input-output systems, Storage systems and RAIDs, Introduction to multicore and multithreaded processors. Upon completion of this course, the student will understand the operations and timing issues of modern microprocessors, memory systems and input/output devices, and the interactions among these components Modern cloud architectural topics will be covered such as AWS technology.
Credit hours: 3.

Student Learning Outcomes

1. Students shall be able to understand the operations and timing issues of modern microprocessors, memory systems and input/output devices, and the interactions among these components.
2. Students shall be able to understand how hardware and software layers – such as the specific algorithm, programming language, compiler, instruction set architecture, and processor implementation – impact program performance.
3. Students shall be able to measure the performance of key processor features, such as caches and branch predictors.
4. Students shall be able to articulate a comprehensive view of architecture and performance for real-world computers.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Students will be using D2L learning management system, Microsoft Word and PowerPoint, using presentation and graphics/organization programs, and be introduced to cloud architecture tools like AWS.

• COSC 1437 or COSC 1337 or CSCI 152 minimum grade C • COSC 2325 or CSCI 241 minimum grade C

Instructional Methods

COURSE REQUIREMENTS: FOLLOW POSTED Rubric on Wix site provided on D2L

Assignments: See course site in D2L for posted assignments, slides and other support material. Project work involves teamwork following industry best practices. There will be regularly assigned homework problems, which may require the application of various software packages. Assignments will be given and returned online via the online eCollege system. It is the student's responsibility to login and check the course eCollege site daily for announcements, assignments and course-related content.
Quizzes: Quizzes may be given as needed.

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Exams: Two exams will be given, one midterm exam and one final exam. Midterm exam will primarily cover topics from Chapters 1-6 (and project), and final exam will be comprehensive.
Project: See D2l for details.
Policy: Follow all rules of ethics, e.g. you should do your own work on exams/projects and for assignments. Copying another student's work is not acceptable. As stated in the "Academic Ethics" section, any indication of cheating and/or plagiarism on an assignment or exam will be an automatic 0 (zero) for all students involved, in addition to disciplinary action.

ATTENDANCE: 100% ONLINE
Check e-college M-F, as a quiz may be given to check attendance anytime. Each student is expected to regularly login to the course website at TAMUC eCollege. Be sure to login regularly each week to view a chapter presentation, to take a quiz or submit an assignment. Meets 1/13/2020 through 5/8/2020 Web Based Class

Student Responsibilities or Tips for Success in the Course

Homework is generally given weekly, while quizzes can be given anytime online to check your regular attendance as needed (however you will be given at least a day to complete). Expect to log on briefly every day at noon to check for any announcements or possible quizzes given as needed.

COMMUNICATION:
All announcements and updates about the course will be posted on course D2L site. Students will also find chapter presentations, quizzes, assignments and/or exams on this portal. For any questions, students can contact via email (or office) during weekdays and I will respond quickly. Each student is responsible for the content/instructions of email communications.

Late Submissions Policy
All work submitted electronically must be submitted by midnight of the due date, unless otherwise noted. To encourage good habits after graduation, late work will be automatic zero.

GRADING

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

A = 90%-100%
B = 80%-89%

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C = 70%-79%

D = 60%-69%

F = 59% or Below

EVALUATION
Attendance (virtual), class-participation & quizzes 10%
Homework Assignments 20%
Project 20%
Midterm Exam 20%
Final Exam (Comprehensive of all the material covered) 30%

Assessments

Student assessments will include weekly homework that covers various topics covered in the chapters. Quizzes will cover critical slides and other topics to reinforce the homework. The project will involve topics that cover topics in book, as well as RUP/IEEE standards that support topics, especially related to modern Cloud technology. The midterm and final will involve cognitive work generally given to support career interests that demonstrates understanding of homework and quiz, as well as project work given, which may include online questions, reports and presentations according to specific format. Quizzes will be given to ensure that the learning outcomes are met.

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

ACCESS AND NAVIGATION

The *syllabus/schedule are subject to change.*

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

Feedback will be provided weekly with grades as needed to encourage timely submission of work. Students will be notified if your work is incorrect, including feedback and grades by D2L and email. Students may make an appointment by phone or office for further clarification anytime.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Attendance is checked with assessments such as quizzes. Late work is a zero to encourage students to get into good habits before graduation.

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.

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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

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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.

COURSE OUTLINE / CALENDAR

TENTATIVE COURSE OUTLINE: Meets 1/13/2020 through 5/8/2020 Web Based Class
Following is the tentative schedule of the topics that will be covered in this course. This schedule is subject to change so it's students' responsibility to watch for course announcements that will be posted on course eCollege site. The course is paced during the semester according to class need.

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Week	Topic
1 Course starts 1/13/2020	Introduction (including cloud architecture topics such as AWS on weekly basis as needed)
2	Processors (instruction sets, registers, RISC and CISC)
3	Processors (continued), primary memory and secondary memory
4	Digital Logic (gates, ALU, flip-flops, memory)
5	Digital Logic (continued)
6	Digital Logic (continued)
7 Midterm	Digital Logic and Microarchitecture
8	Microarchitecture (data path, cache memory, register renaming)
9	Microarchitecture (continued)
10	Microarchitecture (continued)
11 Project v1	Operating System Machine (virtual memory, paging, segmentation)
12	Operating System Machine (continued)
13 Project v2	Assembly Language
14 Review	Parallel Computer Architecture, term report due
15 Last day of class	Final exam due

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