

CSCI 540 Computer Architecture – 01W

COURSE SYLLABUS: Spring 2013 (updated version: Jan 14, 2013)

Instructor: Antone Kusmanoff, Ph.D.
Office Location: Virtual Office Online (Web based course)
Office Hours: Online 8:00 AM – 10:00 AM (Tuesdays and Thursdays) or by appointment
Email can be accessed anytime and usually gets a response within 24 hours
Office Phone: Not Available, use online contact via email and virtual office only
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COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings:

Textbook Required:

Computer systems design and architecture, 2nd edition

By Vincent P. Heuring and Harry F. Jordan,

Pearson Prentice Hall, ISBN: 0-13-048440-7

Optional Readings: Check the textbook's Bibliography after each chapter for appropriate material references for more and up to date information. The student should also investigate Internet sources. This textbook is an excellent book to understand the Computer Architect's design processes and leads the student through the development of what would be a reasonable approach to a RISC design for a somewhat complex embedded design.

Course Description:

This class presents basic computer hardware element concepts, equipment principles, and computer performance evaluation techniques that are used in computer system design processes from an assembler programmer, a computer architect and a logic designer's point of view. The course contains details of components necessary to understand the concepts of machine computing.

Objectives:

This course is for graduate students to study computer hardware architecture and to understand the hardware elements that help determine the overall performance of computer systems. Students who work hard will gain knowledge and develop skills in the aspects shown in the student learning outcomes below. This is not a detailed comprehensive study of computer architectures, but it does touch on critical hardware areas that mainly determine the performance for real computer systems by using a RISC machine model for illustration.

Student Learning Outcomes:

After completing this class, the successful student should have attained the following skills:

1. The student will gain detailed knowledge about general purpose computing machines from the logic design, machine language programming and the architectural point of view.
2. The student will understand the difference in computer classifications of RISC and CISC and how the different classes relate to the computer instruction sets and expected performance.
3. The student will understand the tradeoff events of cost and performance during the hardware design of a computer system: Specifically they will be able to understand evaluation metrics for

speedup, the key memory principle of locality, and the application of software benchmarks to measure hardware capabilities and constraints.

4. The student will be able to understand designs of cache and main memory organization including, cache mapping, replacement strategies, and virtual memory.
5. The student will be able to use design parameters that determines pipelining performance Including pipeline hazards and solutions.
6. The student will understand the interaction and issues of the Input and output (I/O) systems including the hard drive, RAID technology, I/O performance and I/O impact to benchmarks.
7. This is a comprehensive study of architecture and performance using a model RISC computer to allow the student to learn the design process from the computer architect point of view.

COURSE REQUIREMENTS

Instructional / Methods / Activities Assessments

The text for the class will be covered in this class using the text author's slides modified, animated and highlighted by the course instructor. By the end of the semester, the students should have read the assigned chapter sections, studied the presentations, taken quizzes, participated in discussions and have spent some time to be certain they have a general understanding of the reference material in the appendices. The table of contents of the text is basically an outline for the course (as modified by the order and presentation schedule provided below). The schedule by Week and class Unit is given below. It includes start and end dates for each Unit, Quiz dates and Discussion due dates.

1st IMPORTANT NOTICE: The course is scheduled in Class Units and you will only have access to the Unit's quizzes, presentations and discussions during the Unit's scheduled open time frame. No other time during the semester will you be able to view a Unit's material, take the Unit's quiz or submit anything for credit due during that Unit.

All quiz activity, required discussion inputs, bonus questions and any other assignments are provided to the student as each class Unit is opened and the week progresses. A RISC design project is required and there will be a comprehensive final exam (but no midterm exam).

Grading

Discussions: (6 required discussion inputs @ 3% each)	18%
Quizzes: (14 required Quizzes @ 3% each)	42%
RISC Design Project:	20%
A Comprehensive Final exam:	20%
Possible Earned Points	100%
Possible Bonus Points: (10 Bonus Points @ 1% each)	10%

Letter grades will be assigned according to the following scale, rounded to nearest tenth of a point according to Excel worksheet process: **This is strictly followed to get your final Grade.**

A = at least 90.0% of total

B = at least 80.0% but less than 90.0%

C = at least 70.0% but less than 80.0%

D = at least 60.0% but less than 70.0%

F = less than 60.0% of the total points

For Example: 89.94 rounds to 89.9 and would award you a B grade

But: 89.95 rounds to 90.0 and would award you an A grade.

TECHNOLOGY REQUIREMENTS

Prerequisites:

Graduate level TAMU-C CSCI 516

Chapter 6 is on computer mathematics and will not be presented as the students should have spent a considerable amount of time in this area in the prerequisite course and it does not bring new material to the student knowledge base. Instead, the time is spent going much slower through some of the more difficult and technical chapter sections. If you did not do well in CSCI 516, I highly recommend you spend time with the material in chapter 6 and the Appendices which are provided in the text for reference and review of your previous contact with this information as it is necessary for the course.

ACCESS AND NAVIGATION

Access to class material and Uploading to an eCollege Dropbox are described below. However, if you have not taken a TAMUC online course previously, it is required that students take the online student tutorial for eCollege before you begin participation.

1. You can access eCollege either directly or through your myLeo account. To connect to eCollege directly, set your browser to go to **<http://online.tamuc.org/>** Enter your campus ID in the User ID box on left side of the screen and your password in the Password box below the User Id box (it's the same id and password that you use when logging in to your myLeo account). Click on **Go to class**. As long as eCollege itself is up, you can connect to eCollege this way even when myLeo is down or the university's home page is inaccessible. **Or your can** access eCollege through myLeo, log on to your myLeo account and click on **eCollege** in the bar in the upper right of the screen under the myLeo logo (there may be an additional link available in the menu on the left side of your screen). You can bypass the university's home page by going to **<http://online.tamu-commerce.edu>**
2. Once you are in eCollege click on the **MyCourses** tab (next to **Home**) in the upper left corner of the screen between the university logo and the date.
3. Scroll down to the bottom of the MyCourses screen and click on the class you want from the list of online and web-enhanced courses you may be taking this semester. In this case click on **CSCI540 Computer Architecture**.

At this point you can access course material and course tools. You should first read any announcements that are posted, and then enter the class Unit. The Course Home is the only area that is open during any time the entire 16 weeks of the Fall Semester.

To view the class material during all other Units, click on the Unit topic and view all topics or elements in the section during the scheduled open time. To make an assignment upload during an open Unit, follow these directions:

1. On the course page, click on **Dropbox** in the Tools menu bar at the top of the screen, then on the Dropbox page, click on **Submit Assignment**.
3. In the **Basket** drop-down menu, click on the dropbox you want (Program 1, Discussion, Assignment1,etc.). The dropbox selected will appear in the **Basket** box.
4. Where it says "**Attachments: Add/Remove**" under the edit window, click on **Add/Remove**.
5. In the **Add and Remove Attachments** window, either type the name (including path) of the file you wish to upload in the dialog box to the right of **File to Attach:** , or click on the **Browse** button to search for the file you wish to upload. The name of the file selected will appear in the small dialog box to the left of the browse button.
6. If this is the only (or last) file you wish to upload, click on the **Attach File** button underneath the **Browse** button. If this is not the last file to be uploaded at this time, click on the **Save & Attach Another File** button instead of the **Attach File** button and browse for the next file. The name(s) of the selected file(s) will be listed in the **Submit Assignment** window underneath **Attachments: Add/Remove**. If you remember that you wanted to upload an additional file, you can click on the **Submit assignment** button again and browse for another file. A message to accompany the file(s) can be entered into the edit window.
7. Click on the **Submit Assignment** button to initiate the file transfer. The dropbox window will now show the basket name under Outbox with a document icon for each file you uploaded. You can hover the mouse over a document icon to see the name of the file uploaded. If you're not sure it's the correct document, you can click on it to download a copy of the file you uploaded.
8. Click on the key icon in the lower left corner of the screen to exit from the eCollege.

COMMUNICATION AND SUPPORT

Interaction with Instructor and Other Students Statement:

I will and want to accept questions and actively interact with the students on the university email system and in the online virtual office. No other email address will be allowed and emails will be deleted without being read if they are not received on the TAMUC email address given above. My virtual office will always be open to leave messages, questions or comments and I will be online every Tuesday and Thursday between 8 and 10 AM watching for student questions to be able to respond immediately.

You are encouraged to interact with your fellow students on anything except quizzes and exams as long as your activity falls within the academic integrity procedures outlined in this syllabus. Working together in groups should always be limited to discussions describing explanations of presentation topics or difficult issues, clarifying problems and talking about the text solutions and descriptions. However, no student should ever show their work to another student or look at any other student's work of any kind that is an input for the CSCI 540 class.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures:

Late Policy:

Quizzes and Discussions must be accomplished in the Unit specified by the date given and submitted according to the e-college online process requested. Late submittals will not be accepted and you will get a **zero(0) on any work not turned in on time.**

Make-up Policy:

Make-up will be permitted only in the case of having a formal Institution excuse. Events such as going on a business trip or attending a brother's wedding are not acceptable excuses for missing any requirement. If your absence is excused, you will have one chance to take a makeup replacement.

Attendance:

Since this is an online learning course, each student is expected to regularly login to the course website. **YOU WILL BE REQUIRED TO LOGIN AT LEAST TWO TIMES A WEEK TO VIEW A PRESENTATION AND TO EITHER TAKE A QUIZ OR COMPLETE A DISCUSSION INPUT.** I would expect you will need to spend approximately 3-4 hours a week online watching the presentations (one for each Unit), earning bonus points from the bonus questions and completing the quizzes and submitting your discussion requirements. This will bring your class time roughly equivalent to the weekly class attendance required for a campus 16 week class. I will be monitoring attendance.

The assignments have all been announced and scheduled, but you must watch for announcements at the home tab to be certain nothing has changed, **Your activity on e-College web site is monitored and you will get instructor emails if you become deficient in your attendance or assignments.**

University Specific Procedures: 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 132. Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148, StudentDisabilityServices@tamuc.edu or [Student Disability Resources & Services](#)**

Drops:

If you find that you cannot complete the course, please don't forget to drop the course as early as you can. If you simply disappear and stop attending, your grade will be based on only the points you have actually earned, so you will almost certainly get a failing grade for the course.

Academic Integrity:

The university, college, and department policies against academic dishonesty will be enforced. I have a LOW TOLERANCE for cheating and if you are caught you may fail the course. Students found guilty of an act of academic dishonesty are subject to receiving an "F". Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Working with anyone else during any quiz, exam is strictly prohibited.

If you decide to cheat your fellow students in this course (by inappropriate help to others or by getting inappropriate help from others) there will be a penalty. You may or may not be called out on the cheating when you do it. Be assured there are subtle traps and feedback processes built into most of the assignments and exams so that you will eventually suffer a lower final score. Note that cheating opportunities are provided to test your character as well as your knowledge on the subject. It is better to only pass the character test than to only pass the knowledge test, but it is best by far to pass both.

COURSE OUTLINE / CALENDAR (Subject to Change; Watch Course Announcements)

Week	First Day	Last Day	U/P	Q	D	Paragraph Section(s)	Text Pages	Presentation Subject Chapter Titles	
1	14-Jan	20-Jan	U1/P1	BQ		1.1 - 1.8	1-30	Introduction and General Purpose Machine	
2	21-Jan	27-Jan	U2/P2	Q1		2.1 - 2.3	31-57	Machines, Machine Languages, and Digital Logic	
3	28-Jan	3-Feb	U3/P3	Q2	D1	2.4 - 2.6	57-85	Machines, Machine Languages, and Digital Logic	
4	4-Feb	10-Feb	U4/P4	Q3		3.1 - 3.4	87-138	Some Real Machines	
5	11-Feb	17-Feb	U5/P5	Q4	D2	4.1 - 4.4	139-159	Processor design	
6	18-Feb	24-Feb	U6/P6	Q5		4.5 - 4.8	160-187	Processor design	
7	25-Feb	3-Mar	U7/P7	Q6	D3	5.1	189-210	Processor design - Advance Topics	
8	4-Mar	10-Mar	U8/P8	Q7		5.2-5.3	211-229	Processor design - Advance Topics	
9	11-Mar	17-Mar	SPRING BREAK - NO PRESENTATION AND NO ASSIGNMENT						
10	18-Mar	24-Mar	U9/P9	Q8	D4	5.4	230-248	Processor design - Advance Topics	
11	25-Mar	31-Mar	U10/P10	Q9		7.1 - 7.3	303-340	Memory System Design	
12	1-Apr	7-Apr	U11/P11	Q10	D5	7.4 - 7.7	340-370	Memory System Design	
13	8-Apr	14-Apr	U12/P12	Q11		8.1 - 8.2	371-385	Input and Output	
14	15-Apr	21-Apr	U13/P13	Q12	D6	8.3 - 8.5	386-406	Input and Output	
15	22-Apr	28-Apr	U14/P14	Q13		9.1 - 9.7	407-437	Peripheral Devices	
16	29-Apr	5-May	U15/P15	Q14	RISC Design Project		RISC Design Project Due at the end of Unit 15		
17	6-May	10-May	U16/P16	Final Exam Week			Final Exam Scheduled Exam Week at 9:00 PM CST		
Schedule Keys: BQ = Bonus Quiz S = Survey, P = Presentation, U = Unit, Q = Quiz, D = Discussion									
U/P: Presentations are opened 12:00 AM the 1st Day of a Unit & Close 11:59 PM the Last Day of the Unit.									
Q: Quizzes are given 9:00 PM CST each Wednesday and will only cover the previous Unit's presentation.									
D: Discussions are to be placed in Dropbox no later than the close of the Last Day of the Units Assigned.									

Disclaimer:

This schedule, policies, procedures, and assignments are all subject to change in the event of extenuating circumstances. Students must read instructor emails and all course announcements.

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