Texas A&M University-Texarkana

COMPUTER ARCHITECTURE
EE 340 – Fall 2015

SYLLABUS

I. **Instructor:** Dr. P.K. Lala

II. **Office:** 104D

III. **Office Hours:** TBA

IV. **Course Description:** *This course will focus on the interaction of hardware and software in digital computers. It will discuss basic computer structure, machine instructions, assembly language, CPU organization and design, memory addressing , pipelining ,input/output organization and computer arithmetic. Prerequisite: EE321/ CS320*

V. **Course Delivery Method:** *Face-to-face*

VI. **Required Textbooks/Resources***: Computer Organization and Embedded Systems*
Author: C. Hamacher, Z.Vranesic, S. Zaky and N. Manjikian, ISBN-13: 978-0-07-338065-0
Publisher: McGraw-Hill, Copyright: 2012

VII. **Student Learning Outcomes:**

(i) *Demostrate understanding of the major components of a computer*
(ii) *Demonstrate understanding of design principles in instruction set design including RISC architectures*
(iii) *Be able to explain basic instruction level parallelism using pipelining*
(iv) *Demonstarte a basic understanding of assembly language programing code and an understanding of machine level operations.*
(v) *Be able to explain the use of memory hierarchy to reduce the effective memory latency.*
(vi) *Demonstrate the ability to utilize data path and control mechanism design techniques in computing system implementation*

VIII. **Course Outline:**

Basic structure of computers	*week 1*
Instruction set architecture	*weeks 2 and 3*
I/O devices, Assembly process	*weeks 4 and 5*
Test 1	*week 6*
Processing unit	*weeks 7 , 8 and 9*
Pipelining	*weeks 9 and 10*
Bus structure and operations	*week 10*
Test 2	*week 11*
Cache Memory	*week 12*
Virtual memory	*week 13*

Arithmetic operations	*weeks 14 and 15*
Test 3	*week 16*

Additional material may be introduced if time permits

IX. Methods of Evaluation:

Test I	30 pts
Test II	30 pts
Test III	30 pts
Homework	10 pts

X. Grading Scale: A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = 0-59%

XI. Library/Media Resources Assessment: *None.*

XII. ABET Outcome Coverage:

(a) an ability to apply math, science and engineering knowledge
(c) an ability to design a system, component, or process to meet desired needs.
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) A knowledge of contemporary issues

MAPPING among course learning-objectives and ABET student learning outcomes and problems where outcomes are assessed				
Outcome-related course learning objective	**ABET 3a**	**ABET 3c**	**ABET 3i**	**ABET 3j**
(i) Demostrate understanding of the major components of a computer	1 **Test 1**			
(ii) Demonstrate understanding of design principles in instruction set design including RISC architectures			2 **Test 1**	2 **Homework**
(iii) Be able to explain basic instruction level parallelism using pipelining		2 **Test 3**		
(iv) Demonstarte a basic understanding of assembly language programing code and an understanding of machine level operations.		2 **Test 2**		
(v) Be able to explain the use of memory hierarchy to reduce the effective memory latency			3 **Test 3**	
(vi) Demonstrate the ability to utilize data path and control mechanism design techniques in computing system implementation				3 **Homework**

(1=objective addresses outcome slightly, 2=moderately, 3=substantively

- (3a) Apply knowledge of mathematics, science, and engineering.
- (3c) Ability to design a system, component, or process to meet desired needs.
- (3i) Recognition of the need for, and an ability to engage in lifelong learning.
- (3j) A knowledge of contemporary issues

XIII. **Student Participation.** *Participation Policy: Students are expected to attend the lectures*

XIV. **Disability Accommodations:** Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

XV. **Academic Integrity:** Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of 'F' in the course and/or disciplinary actions. For additional information, see the university catalog.

XVI. **A&M-Texarkana Email Address:** Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana

email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

XVII. **Drop Policy:** To drop this course after the census date (see semester calendar), a student must complete the Drop/Withdrawal Request Form, located on the University website http://tamut.edu/Registrar/droppingwithdrawing-from-classes.html) or obtained in the Registrar's Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an "approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email Registrar@tamut.edu, mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. It is the student's responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

XVIII. **Student Technical Assistance:**

- Solutions to common problems and FAQ's for your web-enhanced and online courses are found at this link: http://www.tamut.edu/webcourses/index.php?pageid=37
- If you cannot find your resolution there, you can send in a support request detailing your specific problem here: http://www.tamut.edu/webcourses/gethelp2.php
- Blackboard Helpdesk contacts:
  Office hours are: Monday - Friday, 8:00a to 5:00p

  Julia Allen (main contact) 903-223-3154 julia.allen@tamut.edu

  Frank Miller (alternate) 903-223-3156 frank.miller@tamut.edu

  Nikki Thomson (alternate) 903-223-3083 nikki.thomson@tamut.edu