CSE 2312: Computer Organization and Assembly
Fall 2020

Instructor: Chance Eary
Office Number: Engineering Research Building, Room 647
Email Address: chance.eary@uta.edu
Office Hours: Monday / Wednesday; 7:30am to 8:30am via Microsoft Teams

Section Information:

CSE 2312-003: Monday / Wednesday; 1:00pm to 2:20pm

TA: Hehuan Ma
TA Office Number: Microsoft Teams
TA Email: hehuan.ma@mavs.uta.edu
TA Office Hours:

CSE 2312-004: Monday / Wednesday; 2:30pm to 5:20pm

TA: Huiyang Li
TA Office Number: Microsoft Teams
TA Email: huiyang.li@mavs.uta.edu
TA Office Hours: Monday / Wednesday; 12:30pm to 2:30pm

Description of Course Content:

This course is designed to provide the student with knowledge of fundamental concepts in computer organization. Individual topics include memory hierarchy, instruction set architectures, memory addressing, input-output, integer and floating-point representation, arithmetic and logic operations, etc. The relationship of higher-level programming languages to the operating system and underlying instruction set architecture will be explored, as well as assembly language programming.

Student Learning Outcomes:

- Range, and size of, integer and Boolean variable types
- Basis for 2's compliment encoding of signed integers, ALU signed/unsigned agnostic design
- ALU operating including flag operation
- ALU register interface in the CPU
- Arithmetic, logical and shift operations in the ALU
- Load/store interface between registers and memory
- Memory addressing modes (direct, indirect, indirect indexed, ...)
- Flow control instructions and loops in the ALU
- AAPCS register and calling conventions
- Writing mixed C / assembly programs
- Using the GNU compiler, assembler, linker, and debugger
- Detailed knowledge of ARM arithmetic, logical, load/store, and program flow instructions
- Effects of packing on performance and memory size
- Full decrementing stack design and the stack pointer
- IEEE-754 floating point number range, dynamic range issues, and memory storage
- Pipelined vs non-pipelined designs
- Memory virtualization and paging (heap fragmentation, security implications)

Prerequisite: CSE 1320 – Intermediate Programming

Required Materials:

- "Raspberry Pi Assembly Language: RASPBIAN Beginners", 3/ed, Smith
- Raspberry Pi Model 3 B+, or newer
- HDMI Monitor, Keyboard, Mouse
- Equipment to facilitate the use of Respondus LockDown Browser and Respondus Monitor.
    - Computer with Compatible Operating System
        - Windows 7, 8, or 10
        - MacOS 10.12 or higher
    - Compatible webcam

Recommended Materials:

- "Computer Organization and Design ARM Edition: The Hardware Software Interface", 1/ed, Patterson and Hennessy.
- Ethernet patch cable
- USB to Ethernet Adapter

Attendance:

Pre-recorded lectures will be posted online via Canvas on the days indicated on the course schedule. Students are responsible for all course material whether or not they choose to view the entirety of all provided lectures.

Communication:

- Course updates will be published via Canvas.
- Students will use their University-provided e-mail to communicate with the instructor outside office hours.
- Students will not use Canvas Messenger to communicate with the instructor.
- Students will not use Microsoft Teams to communicate with the instructor outside office hours.
- E-mails sent to chance.eary@mavs.uta.edu will not be read.
- The instructor will not respond to e-mails received after 4:00pm CST on a weekday.
- The instructor will not respond to e-mails received after 4:00pm CST on Friday until the following Monday.
- The instructor will not answer questions about course content while an exam is active.

Programming Lab Policies:

- Labs that fail to compile, or do not terminate correctly, will receive a zero.
- Labs that fail to compile, or do not terminate correctly, may not be resubmitted for a grade. This includes instances where students did not upload the correct file for grading.
- **Students must make a credible attempt to pass all programming labs to receive a passing grade in the course.**

Grading:

Lab 1	05%
Lab 2 and 3	24% (12% each)
Quizzes	28% (07% each)
Midterm	21%
Final	22%

A: 90 – 100
B: 80 – $89.\overline{9}$
C: 70 – $79.\overline{9}$
D: 60 – $69.\overline{9}$
F: 0 – $59.\overline{9}$

Make-up Exams:

- No makeup exams will be provided.
- Exam dates will not be adjusted for any student for any reason.
- Students that do not sit for an exam will receive a zero for that exam.

Grade Grievances:

If a student believes an error has been made in the grading of an assignment, the student has ***one week after a grade is returned*** to resubmit an assignment for re-grading if they believe there is an error.

Late Policy:

For every 24 hour period an assignment is late, 10-points will be deducted from the graded result.

Academic Integrity:

Any student found responsible for an Honor Code violation will receive an F in the course and be referred to the Office of Student Conduct.

Course Schedule – *The following course schedule is tentative and is likely to change*

Date	Day	Topic
26-Aug	Wednesday	**Syllabus**
31-Aug	Monday	
02-Sep	Wednesday	
07-Sep	Monday	No Class - Labor Day
09-Sep	Wednesday	
14-Sep	Monday	**Quiz 1**
16-Sep	Wednesday	
21-Sep	Monday	
23-Sep	Wednesday	
28-Sep	Monday	
30-Sep	Wednesday	**Quiz 2**
05-Oct	Monday	
07-Oct	Wednesday	
12-Oct	Monday	**Test 1 Review**
14-Oct	Wednesday	**Test 1**
19-Oct	Monday	
21-Oct	Wednesday	
26-Oct	Monday	
28-Oct	Wednesday	

02-Nov	Monday	**Quiz 3**
04-Nov	Wednesday	
09-Nov	Monday	
11-Nov	Wednesday	
16-Nov	Monday	
18-Nov	Wednesday	**Quiz 4**
23-Nov	Monday	
25-Nov	Wednesday	No Class - Thanksgiving
30-Nov	Monday	**Test 2 Review**
02-Dec	Wednesday	**Test 2**

Institution Information:

UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the Institutional Information page (https://resources.uta.edu/provost/course-related-info/institutional-policies.php) which includes the following policies among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Mandatory Face Covering Policy:

All students and instructional staff are required to wear facial coverings while they are on campus, inside buildings and classrooms. Students that fail to comply with the facial covering requirement will be asked to leave the class session. If students need masks, they may obtain them at the Central Library, the E.H. Hereford University Center's front desk or in their department. Students who refuse to wear a facial covering in class will be asked to leave the session by the instructor, and, if the student refuses to leave, they may be reported to UTA's Office of Student Conduct.

Student Success Programs:

UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring by appointment, drop-in tutoring, etutoring, supplemental instruction, mentoring (time management, study skills, etc.), success coaching, TRIO Student Support Services, and student success workshops. For additional information, please email resources@uta.edu, or view the Maverick Resources website.

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911.