Computer Architecture and Design

Lab does meet the first week of classes!

Instructor: Dr. Mircea Agapie  
Office: SCIENCE 213-C  
Tel: (254)968-0792
E-mail: agapie@tarleton.edu  
Please always include the course number and the assignment name + number in the subject line of emails, e.g. 3443 Lab 1
Website: http://faculty.tarleton.edu/agapie/ or www.agapie.net
Office hours: Mon, Wed 11-12, Tue, Thu 9 - 11.
Class: Tue + Thu 1:15-2:30 in SCIENCE 112
Lab: Two sections, one on Tue 2:40-5:30, the other Thu 2:40-5:30 in SCIENCE 206


Homework: 6 problem sets will be assigned throughout the semester, due in 1 week.
Mid-term: Oct. 11 or 13 (whichever is your lab).
Final: Tue, Dec. 13, 3-5:30, in the regular lab.

Individual work and quizzes (not graded): During most classes, short quizzes will be assigned to solve on the spot. At the end of class, the instructor will provide a list of easy problems which are recommended to solve before the next class. They are intended as a self-check for the student, to make sure the material covered was understood. Solve both quizzes and individual work in your notebook (see below).

Notebook (not graded): You will need a 100-page notebook for this class. It will contain: class notes, lab notes, circuit diagrams, assembly language code, solutions to individual work problems, solutions to quizzes, cheat-sheets, acronyms etc.

Grading:  
Homework: 20%  
Lab reports: 20%  
Mid-term & Final: 30% each  
A maximum of 5 extra-credit percentage points can be earned by answering questions in class, or by solving problems labeled as such.
Intervals: 88.5-100 = A, 77-88.5 = B, 65.5-77 = C, 54-65.5 = D, below 54 = F.

Effort expected: The average amount of work recommended for college classes is 45 hours of work (during the entire semester) per credit hour. Our class has 4 credit hours, and the semester is 15 weeks long, which gives 12 hours of work per week. After subtracting the 3 hours of lab, we are left with 9 hours of work per week for this class. Please reserve these 9 hours on your weekly schedule. During individual work, you will do one of the following:
• Study the material covered from the textbook, along with the notes taken in class.
• Solve the individual work problems assigned for the next class.
• Solve homework problems.
• Go over quiz problems.
• Practice assembly programming.

Keeping in touch: the following channels of communication will be used. Please do your best to check them often (evening before class is a good idea):
• Email. Please check your Tarleton student email and make sure you clean your mailbox regularly – if it’s full, the messages will bounce back.
• Messages posted on the course website www.agapie.net

Student Learning Objectives: Upon completion of this course with a C or better, students will:
1. Recognize, relate and describe milestone events from the history of computing, and contemporary computing technologies.
2. Be able to program simple control structures in an assembly language.
3. State and apply computer design principles and the many trade-offs involved in the design and implementation of an instruction set.
4. Be able to analyze and design simple datapaths in the hardware, using combinational and sequential circuits.
5. Be able to evaluate the performance of computers, based on quantifiable measures (clock speed, cycles per instruction, program length, instruction mix, cost etc.).
6. Analyze and evaluate hardware optimization techniques (pipelining, caching, etc.).

Topics Covered:
- Layers of abstraction for hardware and software;
- Manufacturing of semiconductor-based chips;
- Arithmetic for computers (signed and unsigned integers + floating point);
- Assembly language instructions; Implementing arrays, loops, decisions, and modules (functions or procedures) in assembly; Memory areas used by a running program, segmentation, stack; Addressing modes;
- Measures of performance;
- Hardware implementation of computer modules: ALU, registers, memory, multiplexers, control unit; Data paths for various instructions;
- Microprogramming;
- Pipelining;
- Caching.

Useful dates:  
Sep.14: Last day to drop a 16-week class with no record  
Nov. 4: Last day to drop a 16-week course with a "Q" or withdraw with a "W"

No classes:  
Sep.5 (Labor Day), Nov.24-25 (Thanksgiving, no classes or labs after noon on the 23rd)

Last day of classes: Dec.7 (Wed.)

Academic Conduct: Students guilty of academic dishonesty, cheating, or plagiarism in academic work shall be subject to disciplinary action. The instructor may initiate disciplinary action in any case of academic misconduct.
- For homework and lab work, it is allowed (actually recommended) for students to brainstorm and develop solutions together, however, the writing and coding have to be done individually.
- It is forbidden to use a solutions manual, or to copy solutions found online.

Absence Policy: Attendance will not be recorded for this course. The student is responsible for any material covered in class and in the lab, and for obtaining assignments and other materials for classes from which they are absent.

Make-up Policy: The instructor has the responsibility and authority to determine if work can be made-up because of absences. Students may request to make-up work for valid and verifiable reasons such as: illness, death in the immediate family, legal proceedings, or participation in sponsored University activities. Let instructor know in advance of any absence/make-up issues. No make-up requests after the due date!

Students with disabilities: It is the policy of Tarleton State University to comply with the Americans with Disabilities Act and other applicable laws. If you are a student with a disability seeking accommodations for this course, please contact the Center for Access and Academic Testing at 254.968.9400 or caat@tarleton.edu. The office is located in Math 201. More information can be found at www.tarleton.edu/caat, in the University Catalog, or at www.ada.gov.
ABET Program Outcomes:

- Introduced: none
- Developed: Criteria 3B, 3K
- Mastered: 3C, 3E, 3I, 3J, 3L.