Assembly Language and Computer Organization

CSCE 2610, Section 001

Spring 2017

Class Timings: Monday, Wednesday, and Friday 1:30 PM – 2:20 PM, NTDP B185

Instructor: Robin Pottathuparambil (Email: rpottath@unt.edu, Office: NTDP F263)

Instructional Assistant: Meherdatta Sourabh Chepuri (Email: Meherdatta-sourabhChepuri@my.unt.edu, Help Lab: Thursday and Friday 3:00 PM to 5:00 PM) and Md Abu Sayeed (Email: MdSayeed@my.unt.edu, Help Lab: Monday and Tuesday 10:30 AM to 12:30 PM)

Course Webpage: All the course related material will be posted on the course webpage which is available through Blackboard (https://learn.unt.edu).

Course Outcomes:

- Understand the role of the different classes and components in a computer system and the interface between software and hardware in a computer system.
- Apply metrics to evaluate performance of a computer system using clock rate and clock cycles per instruction (CPI). Understand the different aspects of execution times reported when program complete their execution.
- Understand instruction set choices and write assembly language programs for simple C code and codes that include procedures.
- Perform integer and floating point calculations using computer arithmetic algorithms.
- Describe the organization of a simple processor with data path and control path for simple instructions.
- Describe the requirement of memory hierarchy and evaluate the performance of different cache organizations.

Text: Computer Organization and Design: The Hardware Software Interface: ARM Edition by Patterson and Hennessy, Morgan Kaufmann, ISBN-13: 978-0128017333

Catalog Description: Prerequisite: CSCE 2100, EENG 2710 or 2720. Principles of computer systems organization, instruction sets, computer arithmetic, data and control paths, memory hierarchies, and assembly language.

Topics:

- Computer Abstractions and Technology
- Instructions: Language of the Computer
- Arithmetic for Computers
- The Processor
- Large and Fast: Exploiting Memory Hierarchy

Grading:

Homework	12%
Programming Assignments	16%
Quizzes	12%
Exam 1 (02/22/2017)	15%
Exam 2 (03/29/2017)	15%
Final Exam (05/06/2017)	30%

Homework: Homework will be in the form of assembly programming and problem sets, with a due date one week after it is assigned. **No late homework will be accepted.** Homework must be done individually (you will learn the most from this). Any evidence of group participation will be interpreted as academic dishonesty. There will be six to seven homework assignments.

Programming Assignments: The programming assignments are an integral part of the course and are intended to provide experience in the application of the design techniques discussed in lecture. There will be four to five programming assignments assigned. Programming assignments must be done individually and can be done on your own PC. Any evidence of group participation will be interpreted as academic dishonesty.

Quizzes: There will be six to seven pop quizzes given throughout the semester. These will be to reward students who consistently show up to class, but will be more than just attendance points.

Exams: There will be two exams and one final exam. Mobiles phones are not permitted. Exams will include material from the lecture, the readings, homework, and programming assignments. Final exam will be comprehensive. Exam dates are:

- Exam 1: Wednesday, February 22nd, 2017 1:30 PM – 2:20 PM, NTDP B185
- Exam 2: Wednesday, March 29th, 2017 1:30 PM – 2:20 PM, NTDP B185
- Final exam: Saturday, May 6th, 2017 10:30 AM – 12:30 PM, NTDP B185

Missing Classes/Assignments/Exams: Attendance at all exams is mandatory. Throughout the semester, a student may miss classes, assignments, quizzes, or exams due to many reasons. Most of the reasons will not be accepted as an "excused" absence. Assignments, quizzes or exams can be made-up <u>only</u> under extraordinary circumstances and <u>only</u> when notification is given to me before the quiz or exam is administered. A no-show for a quiz or exam without prior notification <u>and</u> a verifiable excuse (appropriate official documentation) results in a grade of 0 for that quiz or exam.

Disputing Grades: If you have a dispute with how an assignment, quiz, or exam is graded, you should get the solution to the assignment, quiz, or exam off the class web site and examine it. If you really believe that your answer is correct (matches the answer given in the solution), contact the grader and discuss it with him. The grader will listen to your concern, and act on it, at their discretion. In any case, they will sign the homework verifying that they saw it again. Note that instructor or grader addition errors should follow the above procedure. Assignment, quiz, exam, and homework grades are disputable for **one week** from the day the grades were assigned on Blackboard.

Syllabus Revisions: This syllabus may be modified as the course progresses. Notice of such changes will be by email or announcement in class.

Class Policies: Please note that portable phones, pagers, and late arrivals are disruptive to the instructor and to your peers. The use of cell phones, beepers, or communication devices is disruptive and is therefore absolutely prohibited during class. Turn off your cell phone while in class. If I catch you using these devices, your final grade will be reduced by 10 points for each and every transgression and you will be asked to leave the class. Except in emergencies, students using such devices must leave the classroom for the remainder of the class period. I know that some of you may wish to take notes directly on your computer and I have no problem with that. If, however, you choose to access your email, search the web, play solitaire or other games, or instant messenger your friends during class, you will have 10 points deducted from your final grade for each and every transgression. This penalty will be at the sole discretion of the instructor. If I am late arriving to class, it will be because of circumstances beyond my control. You are expected to remain for 20 minutes past the scheduled class start time while I attempt to communicate my situation and relay instructions.

Course Policies: You are expected to spend at least 10 hours per week for this course. Keep all your graded assignments, quizzes, and tests for study and review. You should track your own progress using Blackboard, and be aware of current grades throughout the term. I will make all the effort to return the graded assignments, but it's your responsibility to collect back the graded assignments from the grader or the instructor if it is not given back to you. Final grading will be done as follows. **A**: 90% - 100%, **B**: 80% - 89%, **C**: 70% - 79%, **D**: 60% - 69% and **F**: < 60%. Grades will be curved if necessary. Grades cannot be changed after they have been electronically entered into the university's system except for instructor error. Any extenuating circumstances that may adversely affect your grade must be brought to my attention before the final course grades are recorded. To be considered, such circumstances must be unusual, unavoidable, and verifiable.

Disability Services/Special Needs: UNT complies with all federal and state laws and regulations regarding discrimination including the Americans with Disability Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services, please contact the Office of Disability Accommodation. Please initiate this process and inform me during the first two weeks of class.

Academic Dishonesty: All the provisions of the University code of academic integrity apply to this course. In addition, it is my understanding and expectation that your signature on any test or assignment means that you neither gave nor received unauthorized aid. For homework and programming assignments, while discussion is allowed, direct copying is not and students must turn in individual submissions. Realize that mastery of the material in the homework and programming assignments will be essential for a good performance on the exams! All students are required to know, observe and help enforce the UNT Code of Student Academic Integrity. Cheating will result in disciplinary action according to UNT Policy 18.1.16. The penalty for a first offense can range from a formal warning to an 'F' for the course. Regardless of the penalty imposed, a record of the offense will be kept in the Office of the Dean of Students.

Tentative Course Schedule:

Week	Lecture	Assignments Due
01/16 – 01/20	Computer Abstractions and Technology	
01/23 – 01/27	Instruction set	
01/30 – 02/03	Instruction set	Homework 1
02/06 – 02/10	Instruction set	Programming Assignment 1
02/13 – 02/17	Instruction set/Review	Homework 2
02/20 – 02/24	Arithmetic for Computers	Exam 1
02/27 – 03/03	Arithmetic for Computers/ Processor design	Homework 3
03/06 – 03/10	Processor design	Programming Assignment 2
03/13 – 03/17	Spring Break	Spring Break
03/20 – 03/24	Processor design/Review	Homework 4
03/27 – 03/31	Processor design	Exam 2
04/03 – 04/07	Processor design	Programming Assignment 3
04/10 – 04/14	Memory Hierarchy	Homework 5
04/17 – 04/21	Memory Hierarchy	Programming Assignment 4
04/24 – 04/28	Memory Hierarchy	Homework 6
05/01 – 05/05	Memory Hierarchy/Review	Comprehensive Final Exam
05/08 – 05/12	No Lecture	