COURSE DESCRIPTION: Concepts of assembly language and the machine representation of instructions and data of a modern digital computer are presented. Students will have the opportunity to study machine addressing, stack operations, subroutines, and programmed and interrupt driven I/O. Also, basic concepts of machine organization are studied. This will include computer architecture at the register level and micro-operation components of instructions. Students will utilize the Intel 8086-80586 instruction set and will perform programming exercises in MS-DOS mode. Prerequisites: CSCI 151

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W 10:00 AM – 11:00  3:30 PM-6:30 PM
TR  Also available by appointment
Communication by email is welcome at any time, evenings, and weekends.
Textbooks: Materials for the major topics for this course are presented in Class Notes, which will be provided to students free of charge.
Supplemental Textbooks: On reserve in the Library for extra reading:
Assembly Language For Intel-Based Computers. Author: Kip Irvine. Publisher: Prentice Hall. 4th Ed.,
Assembly Language for the IBM PC. Author William Jones. Publisher: Jones. 3rd edition.

Student Learning Outcomes: Students will demonstrate knowledge of the following:
Outcome #1 Binary numbering systems and conversions; floating point representation
Determined from Exam #1
Outcome #2 Concepts of Machine Instructions, Assembly and linking, assembly language programming
(Unconditional jumps, flags, subroutines, Stacks )
Determined from Exam #2
Outcome #3 Concepts of Machine Instructions, Assembly and linking, assembly language programming
(Subroutines or Procedures, Stacks )
Determined from Exam #3
Outcome #4 Understanding concepts of Computer Organization
Determined from Exam #4
Outcome #5 Understanding basic concepts of I/O devices; memory mapped I/O; Interrupts ; Arrays, addressing modes and Floating Point Instructions
Determined from Exam #5
Outcome #6 Integration of assembly language instructions, machine cycles, and computing organization.
Determined from Final Exam

SYLLABUS for CSCI 241

January 21 - Assembly Language Overview
January 26, 28 - Numbering Systems  Topics: Number representation; Conversions to and from  BINARY OCTAL HEXADECIMAL DECIMAL 2'S Complement; Logical Operators: AND OR NAND NOR NOT XOR

February 2 Overview of the Assembly & Link Process
Topics: Elementary Instruction Format; Opcodes & Addresses; PROGRAMMING in Assembly Language;
Examples of BIOS ROM Int I/O; Basic Assembly Language Instructions MOV, ADD, SUB, INC, DEC, etc.
February 4  Topics: Flip Flops and Registers
February 9  Topics: Useful functions, using DUMPREGS and DUMPSEM. Writing your first assembly language program; Assignment #1  Install the MASM assembler and assemble the first program
February 11 Test #1 - Numbering systems, 2's complement, Boolean Functions
**February 16** Topics: Basic I/O Operations, ReadChar, WriteChar, WriteString - more program examples

**February 18** Topics: The BIOSROM - History Lesson on 16 bit, 32 bit, 64 bit environments

**February 23** Topics: Unconditional Jump; Compare (CMP); Conditional Jumps; Sign Flag; Zero Flag
Assignments #1,#2,#3

**February 25** Topics: More on Conditional Jumps

**March 2** Topics: More on compiling complex Conditional Jumps, Carry and Overflow; Double Precision ADD example program.

**March 9** TEST #2 - Conditional Jumps and FLAGS

**March 16** Spring Break

**March 23** Topics: Procedures and Subroutine; The Stack; The CALL Statement

**March 30** Topics: PUSH, POP; Examples of how stacks are used in Computer Science

**April 1** Test #3 Procedures and Stacks

**April 6** Topics: Introduction to Computer Organization; Flip Flops and Registers revisited
Micro Operations and the Machine Instruction Cycle; Architecture of the 8086 Microprocessor; Hardware Concepts; AND, OR, NOR, NAND Gates; Flip-Flops: RS, JK, Toggle; Register to Register Transfer

**April 8** Topics: How the computer really works; MOV, JMP, JNS Instruction implementation

**April 13** Topics: CALL RET PUSH and POP defined by Micro Operations

**April 15** Assignment #5, #6; Test #4 Computer Organization

**April 20** Memory Arrays: Indirect addressing, arrays; floating point instructions and representation;

**April 22** Topics: Memory Mapped I/O

**April 27** Topics: More Memory Mapped I/O

**April 29** Topics: Interrupts

**May 4** Topics: Examples of non-memory mapped I/O: Machine I/O

**May 6** Topics: Test #5 - Over Floating Point, Memory Mapped I/O, and Interrupts

**May 13** Comprehensive Final Exam

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**Grade Calculation:**

- A = 90-100
- B = 80-89
- C = 70-79
- D = 60-69
- F = Below 60

(test #1 test #2 test #3 test #4 ) = 70%

Homework=10%

Final Exam=20%

(6 or more unexcused absences = DF Drop Fail)

There will be 6-8 Homework Assignments

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1. If you come into class after your name is called, it is considered an absence. If you have a special circumstance, which prevents you from being in class on time, please come see me.

2. HOMEWORK ASSIGNMENTS: Do your OWN work. There are 6-8 homework assignments designed to help students learn how to program in assembly language. Student who do not do the assignments are more likely to fail the exams. It is an absolute requirement that students be able to write, assemble, link, and run Assembly Language programs. If you do not meet this requirement, you WILL NOT PASS this course.

3. Please also be aware that any students who is caught cheating during an exam, as a first offense, will receive the grade of "F" on that exam. Students with a second offense of cheating will receive the grade of "F" in the course.

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct).
EARLY INTERVENTION FOR FIRST YEAR STUDENTS:
Early intervention for freshmen is designed to communicate the University’s interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be mailed by the end of the sixth week of the semester.

Students requesting accommodations for disabilities must go through the Academic Support Committee. For more information, please contact the Director of Disability Resources & Services, Halladay Student Services Bldg., Room 303D, (903) 886-5835.

Students with Disabilities:
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, Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.