COURSE TITLE: Assembly Language And Computer Architecture

COURSE SUBJECT AND NUMBER: CISS 280

DEPARTMENT: Computing and Information Sciences

CREDIT HOURS: 4

CONTACT HOURS: 4 Lecture

SEMESTER COURSE IS OFFERED: Spring Fall

OFFERED DISTANCE LEARNING: ____X____ Yes _____ No

PREREQUISITES (list): ____X____ Yes _____ No CISS 111- Programming & Logic II Data Structures with a grade of C or better or by permission of Department Chair

COREQUISITES (list): ______ Yes ____X____ No

PREREQUISITE(S) OR COREQUISITE(S): _____Yes ____X____No


LAB FEES: ______ Yes ____X____ No

FINAL EXAM: ___X____ Final Exam _____ Final Project

ORIGINAL SUBMISSION DATE: 9/17/07

CURRICULUM COMMITTEE APPROVED REVISION DATE:

PREPARED BY: James Looby

COURSE DESCRIPTION: This course offers an introduction to Assembly Language and Computer Architecture. Topics include Boolean logic, data representation, processor and computer architecture, memory management, registers, machine instruction sets, addressing, subroutines, parameter passing, assembly and linking.
ACTIVITIES AND ASSIGNMENTS: Topics will include but are not limited to:

- Programming assignments
- In-class assignments and participation
- Quizzes
- Final Exam

GRADE COMPUTATION: (In general terms as defined by college policy. Specifics, including Z grade, will be defined on the instructor’s syllabus).

Programming Assignments and Quizzes: 75%

Final: 25%

ADA COMPLIANCE: In compliance with the Americans with Disabilities Act of 1990 and with Section 504 of the Rehabilitation Act, Hudson Valley Community College is committed to ensuring educational access and accommodations for all its registered students, in order to fully participate in programs and course activities or to meet course requirements. Hudson Valley Community College’s students with documented disabilities and medical conditions are encouraged to access these services by registering with the Center for Access and Assistive Technology to discuss their particular needs for accommodations. For information or an appointment contact the Center for Access and Assistive Technology, located in room 130 of the Siek Campus Center or call 518-629-7154/TDD: 518-629-7596.

STUDENT BEHAVIORAL OBJECTIVES:

Students will be able to:

- Demonstrate and utilize computer numbering systems and data representation which includes bits, bytes, the binary numbering system, hexadecimal representation, ASCII code, signed and unsigned data representation through assessments.

- Demonstrate and apply the use of computer organization and architecture which includes the computer components, internal memory, segments and addressing, registers, and hardware interrupts through assessments and programming assignments.

- Understand and implement operating system which includes the BIOS boot process, system program loader, the stack, instruction execution and addressing, instruction operands and protected mode execution through assessments and programming assignments.

- Demonstrate and explain computer memory and instruction execution which includes assembly language programming and debugging, symbolic instruction sets, addressing modes, program logic and control, program assembly and program linking through assessments and programming assignments.

- Demonstrate and utilize input output which includes keyboard and video processing, data manipulation (ASCII, BCD, Binary), basic mouse operations and disk storage through assessments and programming assignments.

SEMESTER OUTLINE:
I. FUNDAMENTALS OF PC HARDWARE AND SOFTWARE.

1. Basic Features of PC Hardware.

   Internal Memory. Segments and Addressing. Registers. Hardware Interrupts.

2. Instruction Addressing and Execution.

   Features of an Operating System. The BIOS Boot Process. The System Program Loader. The Stack. Instruction
   Execution and Addressing. Instruction Operands. Protected Mode.

3. Examining Computer Memory and Executing Instructions.

   Using the DEBUG Program. Viewing Memory Locations. Machine Language Example I: Using Immediate
   Instruction. Using the PTR Operator.

II. FUNDAMENTALS OF ASSEMBLY LANGUAGE.

4. Requirements for Coding in Assembly Language.

   Assembly Language Features. Conventional Segment Directives. Simplified Segment Directives. Initializing for
   Protected Mode. Defining Types of Data. Equate Directives.

5. Assembling, Linking, and Executing Programs.

   Preparing a Program for Assembling and Execution. Two-Pass Assembler. Linking an Object Program.
   Writing .COM Programs.


   The Symbolic Instruction Set—An Overview. Data Transfer Instructions. Basic Arithmetic Instructions.
   Repetitive Move Operations. The INT Instruction. Addressing Modes. The Segment Override Prefix. Near and
   Far Addresses. Aligning Data Addresses.

7. Program Logic and Control.

   Short, Near, and Far Addresses. The JMP Instruction. The LOOP Instruction. The Flags Register. The CMP

III. VIDEO AND KEYBOARD OPERATIONS.


   Screen Features. Setting the Cursor. Clearing the Screen. INT 21H Function 09H for Screen Display. INT 21H
   Function 0AH for Keyboard Input. INT 21H Function 02H for Screen Display. File Handles. INT 21H Function
   40H for Screen Display. INT 21H Function 3FH for Keyboard Input.


BIOS Keyboard Data Areas. INT 21H for Keyboard Input. INT 16H for Keyboard Input. Extended Function Keys and Scan Codes. BIOS INT 09H and the Keyboard Buffer.

IV. DATA MANIPULATION.


Characteristics of a Disk Storage Device. The Disk System Areas and Data Area. The Boot Record. The Directory. The File Allocation Table. Processing Files on Disk.

15. Disk Storage II: Writing and Reading Files.


SPECIAL TOPICS - As Time Permits

Defining and Using Macros.


Linking to Subprograms.

Program Loading and Overlays.


Benefits for Veterans:
https://www hvcc edu/veterans/