



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**ASSEMBLY LANGUAGE PROGRAMMING
CIS_1909 3 Credit Hours**

Student Level:

This course is open to students on the college level in either the Freshman or Sophomore year.

Catalog Description:

CIS1909 – ASSEMBLY LANGUAGE PROGRAMMING (3 hrs)

This course will introduce students to various concepts involved in assembly language programming. These topics include computer hardware organization, digital data, writing assembly programs, debugging, commenting, analyze solutions needing assembly language, and integration with other languages

Prerequisites:

CIS1876 – C Programming

Controlling Purpose:

This course is designed to provide an introduction to assembly language programming. These concepts provide a foundation for future studies in courses related to engineering and computer engineering.

Learner Outcomes:

Upon completion of the course, the student will be able to explain a computer’s instruction set, change binary digital data, design assembly language solutions, write assembly language programs including various programming elements, and integrate assembly language with a higher level programming language.

Units Outcomes and Clock Hours of Instruction for Core Curriculum:

The following outline defines the minimum core content not including the final examination period. Instructors may add other material as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the

- goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: Processor Systems						
Outcomes: The student will be able to explain the significance of processor systems in relation to programming.						
A	B	C	D	F	N	Specific Competencies
						Explain processor systems
						Explain program preparation
						Outline the general form of processor systems
						Describe processor operation
						Explain transfers to and from the CPU
						Describe the uses of numbers and codes
						Explain the connection between program development and processor systems

UNIT 2 : Software Engineering						
Outcomes: The student will be able to describe the process of software engineering in information technology						
A	B	C	D	F	N	Specific Competencies:
						Describe program specification
						Explain the design processes for complex system
						Define the operation of programs and modules
						Represent program control structures graphically
						Explain the role of data
						Describe the software design process
						Outline top down design
						Describe the facets of testing

UNIT 3: Basics of Assembly Language

Outcomes: The student will be able to use the basic components to write simple assembly language programs.

A	B	C	D	F	N	Specific Competencies
						Describe the methodology of assembly language programming
						Explain instruction action
						Explain instruction definition
						Use basic operands
						Use program comments, directives, and labels
						Use simple instructions along with pseudo instructions

UNIT 4: Sequencing

Outcomes: The student will be able to use branching in an assembly language program

A	B	C	D	F	N	Specific Competencies
						Use branches
						Use flags, tests, and conditional branches
						Use conditional branching
						Explain flag settings

UNIT 5 : Program Structures

Outcomes: The student will be able to use looping in an assembly language program

A	B	C	D	F	N	Specific Competencies:
						Describe the facets of sequencing
						Build conditional structures
						Use simple loops with exit conditions

UNIT 6 : Simple Data

Outcomes: The student will be able to explain the nature of simple data transfer and write assembly language programs to accomplish the transfer

A	B	C	D	F	N	Specific Competencies:
						Use instructions to transfer data to and from memory
						Explain data transfer between registers and memory
						Explain addressing modes
						Use byte size values

						Explain assembly language data
						Use assembly language data for simple data

UNIT 7 : Program Modules

Outcomes: The student will be able to write assembly language programs that implement a modular approach

A	B	C	D	F	N	Specific Competencies:
						Describe subroutines
						Explain stacks
						Use subroutines
						Describe the safe use of stacks
						Use testing in subroutines

UNIT 8 : Manipulating Bits and Bit Patterns

Outcomes: The student will be able to write assembly language programs that use various methods to manipulate bits and bit patterns.

A	B	C	D	F	N	Specific Competencies:
						Explain logical instructions, masking, bit forcing, <shifter_operand> forms
						Use logical instructions
						Use masking and bit forcing
						Use various forms of <shifter_operand>

UNIT 9 : Arithmetic Operations

Outcomes: The student will be able to explain number representation and write programs to perform arithmetic operations

A	B	C	D	F	N	Specific Competencies:
						Describe number representation
						Perform arithmetic operations with numbers in two representations
						Explain integer forms that do not use 32-bits
						Use multiplication and division

UNIT 10 : Input and Output (IO)

Outcomes: The student will be able to write assembly language programs to perform input and output operations

A	B	C	D	F	N	Specific Competencies:
						Explain simple IO, serial IO, and aspects of IO
						Use simple IO
						Use serial IO
						Explain input from switches and external events
						Explain timing of IO actions

UNIT 11 : Advanced Topics

Outcomes: The student will be able to integrate assembly language into a higher level programming language

A	B	C	D	F	N	Specific Competencies:
						Explain advanced assembler features
						Use assembler arithmetic
						Explain high level and mixed language programming
						Use techniques to integrate assembly language with a higher level language

Projects Required:

Varies, refer to syllabus.

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

None

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Time Frame:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class and which requires accommodations, contact the Disability Services Coordinator.