Glendale College

Course Outline of Record Report

Course ID 005211

Revision - May 2025

CS/IS165 : Computer Architecture And Assembly Language

General Information

Author:	• Tony Biehl
Attachments:	DE Addendum_CS:IS_165(CE)_COR_8:1:20_CoDE_2:27:24.pdf DE Addendum_CS:IS_165 COR_09_01_2020 CoDE_09_26_2023.pdf
Course Code (CB01) :	CS/IS165
Course Title (CB02) :	Computer Architecture And Assembly Language
Department:	CSIS
Proposal Start:	Spring 2026
TOP Code (CB03) :	(0707.10) Computer Programming
CIP Code:	(11.0201) Computer Programming/Programmer, General.
SAM Code (CB09) :	C - Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	Yes
Course Control Number (CB00) :	CCC000296817
Curriculum Committee Approval Date:	05/14/2025
Board of Trustees Approval Date:	07/08/2025
Last Cyclical Review Date:	03/27/2024
Course Description and Course Note:	CS/IS 165 introduces the student to computer architecture as well as the world of assembly language programming. The mapping of statements and constructs in a high-level language onto sequences of machine instructions is studied, as well as the internal representation of simple data types and structures. Numerical computation is examined, noting the various data representation errors and potential procedural errors.
Justification:	Transferability/C-ID Change
Academic Career:	• Credit
Mode of Delivery:	No value
Author:	No value
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	• Computer Science
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

C-ID	Area	Status	Approval Date	Comparable Course
COMP	Computer Science	Approved	02/17/2015	COMP 142 - Computer Architecture and Organization

Units and Hours

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	72
Total Course Out-of-Class Hours	144
Total Student Learning Hours	216

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

Course Student Hours

	In Class	Out of Class
Lecture Hours	4	8
Laboratory Hours	0	0
Studio Hours	0	0

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	72
Laboratory	0
Studio	0
Total	72
Course Out-of-Class Hours	
Lecture	144
Laboratory	0
Studio	0
Total	144

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Prerequisites, Corequisites, Recommended Corequisites, and Recommended Preparation

Prerequisite

CS/IS135 - Programming In C/C++

Objectives

- Examine problems, apply logic, and provide solutions/algorithms for the problems.
- Recognize programming problems on a function-by-function basis and develop structured/procedural code based on this approach.
- Demonstrate an understanding of object-oriented programming concepts and object-oriented design in creating a program.
- Program in the C++ language including use of objects, pointers, and structures.

Entry Standards

Entry Standards	Description
No value	No value

Course Limitations

Cross Listed or Equivalent Course	Description
No value	No value

Requisite Validation

Upload Statistical Validation and/or other documents (if necessary)

No Value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Multimedia
Methods of Instruction	Demonstrations

Out of Class Assignments

- Programming assignments (e.g. write simple assembly language program segments)
- Homework assignments (e.g. decimal to binary conversions)

Methods of Evaluation	Rationale
Exam/Quiz/Test	Final examination
Exam/Quiz/Test	Midterm examinations and quizzes

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN

Warford, J. Stanley	Computer Systems	Boston: Jones and Bartlett	2017	9781284079630

Other Instructional Materials (i.e. OER, handouts)

No Value

Learning Outcomes

Course Objectives

Utilize assembly language to do operations such as decimal and string I/O.

Apply the assembly language instructions and pseudo operations to create a program.

Create assembly language programs using stacks, arrays, input and output operations and other instructions.

Use binary representations of integer, floating point, and characters.

Use and adapt to another form of assembly language.

Explain fundamental computer architecture.

Explain the language translation process.

SLOs

Distinguish and categorize the architectural components of a computer. Expected Outcome Performance: 70.0

CSIS Computer Programmer - Certificate	Analyze a programming task/problem; based on that analysis, design and implement an object oriented program using multiple classes in a high level language.
ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
CSIS Information Technology Certificate	Demonstrate installing, configuring and maintaining computer and mobile devices, including diagnosing, resolving and documenting common hardware and software.
CSIS Information Technology - A.S. Degree Major	Demonstrate installing, configuring, and maintaining computer and mobile devices, including diagnosing, resolving, and documenting common hardware and software.

CSIS Computer Science - A.S. Degree Major	Prepare a software project to implement a single scientific, mathematical, business, or technical function.
CSIS Computer Science - Certificate	Prepare a software project to implement a single scientific, mathematical, business, or technical function.
CSIS Computer Software Technician	demonstrate the ability to independently create, save, modify and print a document using a word processing program and appropriate assistive technology
CSIS Web Development - A.S. Degree Major	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.
CSIS Web Development - Certificate	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.

Describe a computer system as a construct built upon many layers of abstraction. Expected Outcome Performance: 70.0

CSIS Computer Programmer - Certificate	Analyze a programming task/problem; based on that analysis, design and implement an object oriented program using multiple classes in a high level language.
ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
CSIS Information Technology Certificate	Demonstrate installing, configuring and maintaining computer and mobile devices, including diagnosing, resolving and documenting common hardware and software.
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CSIS Web Development - Certificate	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.

Demonstrate proficiency in programming using assembly and machine language. Expected Outcome Performance: 70.0

CSIS Computer Programmer - Certificate	Analyze a programming task/problem; based on that analysis, design and implement an object oriented program using multiple classes in a high level language.
ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
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CSIS Computer Science - Certificate	Prepare a software project to implement a single scientific, mathematical, business, or technical function.
CSIS Computer Science - A.S. Degree Major	Prepare a software project to implement a single scientific, mathematical, business, or technical function.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues
CSIS Computer Software Technician	demonstrate the ability to independently create, save, modify and print a document using a word processing program and appropriate assistive technology
CSIS Web Development - A.S. Degree Major	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.
CSIS Web Development - Certificate	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No Value

Is this proposal submitted in response to learning outcomes assessment data?

No Value

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Computer Systems (4 hours)
- Levels of abstractions
- Hardware
- Software
- Database systems

C++ (6 hours)
- Variables
- Flow of control
- Functions
- Recursion

Information Representation (12 hours)
- Bits, bytes, and words
- Unsigned binary representations
- Signed and two's complementation representation
- Operations in binary
- Hexadecimal and character representation
- Fixed and floating point representation

Computer Architecture (generic machine) (8 hours)
- Hardware
- Character I/O and direct addressing
- von Neumann machines
- Control unit, instruction fetch, decode, and execution
- Input/output (basic)
- Programming of a particular generic computer

Assembly/Machine Language (12 hours)
- Assemblers
- Instruction format, addressing modes
- Decimal I/O and immediate addressing
- Symbols
- Assignment statements

Compiling to the Assembly Level (12 hours)
- Branching and flow of control
- Procedures: subroutine call and return
- Arrays and records
- Data representation

Language Translation Principles (4 hours)
- Language
- Grammars
- Parsing
- Finite state machines

Operating System Topics (5 hours)
- Loaders
- Interrupts

Storage Management (4 hours)
- Main memory
- File management

Combinational Networks (5 hours)
- Boolean algebra
- Combinational analysis

Total hours: 72

Additional Information

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Is it possible this course will have a material fee?

No Value

I have contacted my library liaison (https://campusguides.glendale.edu/faculty/liaisons):

No Value

What term(s) will this course be offered?

No Value

Will any additional resources be needed for this course? (Click all that apply)

No Value

If additional resources are needed, add a brief description and cost in the box provided.

No Value