

CS 10 Course Outline as of Fall 2013**CATALOG INFORMATION**

Dept and Nbr: CS 10 Title: INTRO TO PROGRAMMING

Full Title: Introduction to Computer Programming

Last Reviewed: 2/8/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	1.00	6	Lab Scheduled	17.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00

Total Student Learning Hours: 227.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: CIS 10

Catalog Description:

Specification, design, implementation, testing, debugging, maintenance, and documentation of computer programs. Topics include algorithms, languages, software engineering, control structures, functions, data abstraction using classes, and arrays. Numerous programs are written in C++. Intended for both computer science majors and for those seeking a general introduction to computer programming.

Prerequisites/Corequisites:

Completion of MATH 154 or MATH 155 or higher; or Qualifying Placement from Math Assessment.

See Student Success & Assessment Services (assessment.santarosa.edu) for more information about the assessment process.

Recommended Preparation:

Eligibility for ENGL 1A or equivalent

Limits on Enrollment:**Schedule of Classes Information:**

Description: Specification, design, implementation, testing, debugging, maintenance, and

documentation of computer programs. Topics include algorithms, languages, software engineering, control structures, functions, data abstraction using classes, and arrays. Numerous programs are written in C++. Intended for both computer science majors and for those seeking a general introduction to computer programming. (Grade or P/NP)

Prerequisites/Corequisites: Completion of MATH 154 or MATH 155 or higher; or Qualifying Placement from Math Assessment.

See Student Success & Assessment Services (assessment.santarosa.edu) for more information about the assessment process.

Recommended: Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
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CSU Transfer:	Transferable	Effective:	Spring 1989	Inactive:
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UC Transfer:	Transferable	Effective:	Spring 1989	Inactive:
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CID:

CID Descriptor:COMP 122	Programming Concepts and Methodology I
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SRJC Equivalent Course(s):	CS10A OR CS10B
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CID Descriptor:COMP 112	Introduction to Programming Concepts and Methodologies
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SRJC Equivalent Course(s):	CS10A
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Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon completion of this course students will be able to:

1. Translate integers, real numbers, and characters into machine representation.
2. Create correct and efficient algorithms.
3. Implement the software-development life cycle.
4. Produce multi-file programs using an integrated development environment.
5. Employ the basic elements of the C++ language.
6. Use object-oriented language features as a client programmer.
7. Implement algorithms using C++ flow-control constructs.
8. Identify career objectives related to Computer Science.
9. Use information and learning resources as they pertain to Computer Science.

Topics and Scope:

1. Basic Computer Organization
 - a. Basic hardware components of a computer
 - b. Binary representation of data

2. Algorithms
 - a. The concept of an algorithm
 - b. Problem solving techniques
 - c. Efficiency and correctness
3. Languages
 - a. History
 - b. Procedural vs. object-oriented
 - c. Compiled vs. interpreted
4. Software Engineering
 - a. The software life cycle
 - b. Object-oriented design
 - c. Functional decomposition
 - d. Documentation
 - e. Ethical Issues
5. Integrated Development Environments
 - a. Projects
 - b. Editors
 - c. Debuggers
6. C++ Language Basics
 - a. Interactive input/output
 - b. File input/output
 - c. Variables and constants
 - d. Arithmetic expressions and operators
 - e. Data types int, double, char, bool, and string
7. Decision Structures
 - a. If and if/else statements
 - b. Switch statement
 - c. Logical expressions and operators
8. Iteration Structures
 - a. While statement
 - b. Do-while statement
 - c. For statement
 - d. Nested logic
9. Functions
 - a. User-defined functions: void and value-returning
 - b. Top-down design/stepwise refinement
 - c. Procedural abstraction
 - d. Scope and lifetime of identifiers
 - e. Reference and value parameters
 - f. Library functions
10. Classes
 - a. Structs
 - b. Data abstraction and abstract data types
 - c. Encapsulation/information hiding
 - d. Private/public members
 - e. Class scope
 - f. Using multiple files
 - g. Constructors, including multiple constructors
 - h. Passing objects using const &
 - i. Declaring const member functions
11. Arrays
 - a. One-dimensional arrays

- b. Multi-dimensional arrays
 - c. Null terminated strings (as arrays)
 - d. Insert, delete, and sequential search for unordered list
 - e. Insert, delete, and binary search for ordered list
12. Enumeration types

Assignment:

1. Read approximately 30 pages per week.
2. Complete 10-15 programming assignments, with documentation, using the C++ programming language.
3. Complete 2-8 examinations including final exam.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written program documentation	Writing 10 - 20%
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Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Programming assignments	Problem solving 20 - 60%
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Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%
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Exams: All forms of formal testing, other than skill performance exams.

Exams, Final Exam: (Multiple choice, true/false, matching items, completion, programming problems)	Exams 20 - 60%
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Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%
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Representative Textbooks and Materials:

Programming and Problem Solving with C++, by Nell Dale - Jones and Bartlett, 5th edition, 2010