

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Programming Algorithms
COURSE NUMBER	CIST-0180
DIVISION	Career and Technical Education
DEPARTMENT	CIST
CIP CODE	11.0901, 15.1201, 15.1204, 47.0104
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3 Lab: 1
PREREQUISITES	CIST-0120 Programming Fundamentals
COREQUISITES	None

COURSE DESCRIPTION

This course is an introduction to the elementary of computer programming. Java will be used by students to create java programs using Window Operating system. Students will demonstrate the basics and the fundamentals of computer programming by creating java programs. Extensive hands-on experiences are emphasized.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. Develop Java application: Develop a complete Java procedural application.

INSTITUTIONAL LEARNING OUTCOMES

- Communication
- Computation and Financial Literacy
- Critical Reasoning
- Technology and Information Literacy
- Community and Civic Responsibility
- Personal and Interpersonal Skills

TEXTBOOKS

<http://kckccbookstore.com/>

METHOD OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Introduction to Computers and Java Programming
 - A. Java syntax
 - B. Java programming environment
 - C. Dealing with compilation errors
 - D. Basic debugging skills
- II. Input, Processing, and Output
 - A. Designing a Program
 - B. Input, Output, and Variables
 - C. Variable Declarations and Data Types
 - D. Variable Assignment and Expressions
 - E. Named Constants
- III. Methods
 - A. Introduction to Methods
 - B. Defining and Calling a Methods
 - C. Passing Arguments to Methods
 - D. Variables Scope
- IV. Decision Structures and Boolean Logic
 - A. Introduction to Decision Structures
 - B. Dual Alternative Decision Structures
 - C. Nested Decision Structures
 - D. The Case Structure
 - E. Logical and comparison Operators
- V. Repetition Structures
 - A. Introduction to Repetition Structures
 - B. Condition-Controlled Loops: While and Do-While
 - C. Count-Controlled Loops and the For Statement
 - D. Nested Loops
- VI. Arrays
 - A. Array Basics
 - B. Parallel Arrays
 - C. Two and Multi-Dimensional Arrays
 - D. Arrays and Methods
- VII. Sort and Search Algorithms
 - A. Linear search and binary search algorithms
 - B. Bubble sort selection sort and insertion sort algorithms
- VIII. Files

- A. Introduction to File Input and Output
- B. Using Loops to Process Files
- C. Using Files and Arrays
- IX. Object-Oriented Programming
 - A. Procedural and Object-Oriented Programming
 - B. Classes and Objects
- X. Algorithms
 - A. Searching
 - B. Sorting

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon completion of the course, the student will:

- A. Describe and demonstrate the usage of contemporary programming methodology, specifically Java programming.
 1. Demonstrate dialog with designing applications.
 2. Demonstrate the ability to solve problems through proper program design.
 3. Complete a Task, Object, Event chart.
 4. Plan an object's code using pseudo code or a flowchart.
 5. Demonstrate the planning of an application.
- B. Participate in problem-solving teams.
 6. Demonstrate ability to participate in problem-solving teams.
- C. Analyze, design, code, document, and test Java programs using the most common features and standards of the language.
 7. Follow Windows standards regarding the use of graphics, fonts, and colors.
 8. Demonstrate the use of color with designing applications.
 9. Set the properties of a label, picture box, and button control.
 10. Demonstrate the ability of coding using variables and constants.
 11. Design and develop programs using random access file access with the selection structure.
 12. Demonstrate the use of the repetition structure.
 13. Develop programs to give users use of sequential access files.
 14. Demonstrate the use of dialog boxes.
 15. Demonstrate error trapping.
 16. Write an If..., Then..., Else statement.
 17. Write code that uses comparison operators and logical operators.
 18. Code a case selection structure.
 19. Create and call an independent Sub procedure.
- D. Create some basic user-friendly interfaces using Java as a tool for creation.
 20. Identify and explain the use of graphical user interface using Java.
 21. Show the proper use of menus with designing applications.
 22. Demonstrate the use of controls with designing applications.

23. Develop programs to give users use of menus.
 24. Delete a control from the form and code from the code editor Window.
 25. Create a message box.
- E. Summarize use reference manuals, help tools, and debugging tools to solve problems.
26. Demonstrate the ability to use reference manuals and help tools.
 27. Use debugging tools to correct programming errors.
- F. Explain and write programs that use sort and search algorithms.
28. Explain and demonstrate sort algorithms
 29. Explain and demonstrate search algorithms.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.