Computer Technology
Computer Programming II
(Joint Course with Business Technology Approved 10/29/10 for that area)

This course is designed to enhance skills developed in Computer Programming I in object-oriented programming language skills using high level languages such as *Java, C++,* and *BASIC.* The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs. This second-level course leads to Game Programming.

Recommended Prerequisites: Computer Programming I

Suggested Prerequisites:

Grades: 11, 12

Recommended Credit: 1 Credit

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Standard 1.0

The student will develop and apply concepts related to human relations, safety, career development, communications, and leadership skills for a global workplace.

Standard 2.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle.

Standard 4.0

The student will write and document an executable program with high level languages such as *Java, C++,* and *BASIC* using best coding practices.

Standard 5.0

The student will work as a team member to develop integrated application using high level languages such as *Java, C++,* and *BASIC.*

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Course Description:

This course is designed to enhance skills developed in Computer Programming I in object-oriented programming language skills using high level languages such as *Java, C++,* and *BASIC.* The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs. This second-level course leads to Game Programming. *(This course requires a computerized workstation for each student with appropriate* program development tools *and compiler software.)*

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Standard 1:0

The student will develop and apply concepts related to human relations, safety, career development, communications, and leadership skills for a global workplace.

Learning Expectations

The student will:

1.1   Demonstrate sensitivity to personal, societal, corporate, and governmental responsibility to community and global issues.

1.2   Demonstrate the interpersonal, teamwork, and leadership skills needed to function in diverse business settings, including the global marketplace.

1.3   Communicate effectively as writers, listeners, and speakers in diverse social and business settings.

1.4   Apply the critical-thinking and soft skills needed to function in students' multiple roles as citizens, consumers, workers, managers, business owners, and directors of their own futures.

1.5   Analyze and follow policies for managing legal and ethical issues in organizations and in a technology-based society.

1.6   Investigate the life-long learning skills that foster flexible career paths and confidence in adapting to a workplace that demands constant retooling.

1.7   Assess personal skills, abilities, aptitudes, and personal strengths and weaknesses as they relate to career exploration and apply knowledge gained from individual assessment to research and develop an individual career plan.

1.8   Examine the goals and principles of a professional organization. (Ex. Computer Science Club, BETA Club, FBLA)

    1.9   Investigates online and office safety procedures and passes a written safety examination with 100% accuracy.

    1.10   Demonstrates parliamentary procedure through office staff/chapter organizational meetings.

    1.11   Apply appropriate typography concepts to industry documents.

Student Performance Indicator: Evidence Standard Is Met

The student:

➢ Develops a presentation, applying typography guidelines, that illustrates ethical and legal behavior in written and spoken portions of the presentation and recognizes the implications of violating federal and state laws related to the use of technology and copyrighted materials.

➢ Models and role plays examples of behavioral expectations in the workplace, including soft skills and team building.

➢ Demonstrates skills necessary for safety and environmental protection in the workplace and passes a written safety exam with 100% accuracy.

➢ Develops a presentation, applying typography guidelines illustrating ethical behavior in what are written, spoken, or presented and legal issues recognizing the implications of violating federal and state laws including the use of technology and copyrighted materials.

➢ Illustrates modeling and role playing of examples of behavioral expectations in the workplace including soft skills and team building.

➢ Demonstrates parliamentary procedure through office staff/chapter organizational meetings.

➢ Participates in professional development leadership activities.
  - ➢ Creates a design and lays out a membership brochure to promote membership.
  - ➢ Creates a design and lays out a flyer to promote the local activities of the charitable organization such as the Red Cross.

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Sample Performance Task

> ➢ Design and produce a team project on legal and ethical issues that includes issues and penalties for plagiarism, copied text that does not require permission, and copied data that requires permission and the process used in obtaining permission. Obtain formal permission for use of quotations, art form, design, music, and photographs. Develop and present a total team project utilizing various technology components and appropriate typography concepts.
>
> ➢ Use the Internet to research health and safety issues in a computer work environment. Compose and assemble a safety manual using appropriate typography concepts. Develop a presentation on right-to-know laws and any other laws required for safety.

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Standard 2.0

> **The student will demonstrate proficiency in the background knowledge of computers and programming.**

Learning Expectations

The student will:

2.1 Discuss the history of computers and programming languages.
2.2 Discuss the components of the computer.
2.3 Summarize the distinguishable characteristics of the high level *Programming* languages such as ***Java, C++,*** and ***BASIC.***
2.4 Critique the role of computer programming in society.

Student Performance Indicator: Evidence Standard Is Met

The student:

➢ Summarizes the history of computers and programming languages.
➢ Explains the purposes of the high level languages such as ***Java, C++,*** and ***BASIC.***
➢ Examines the role of computer programming in society.

Sample Performance Task

➢ The student will develop a timeline for the history of computers and programming languages. Proficiency would be evaluated by the given dates and the content area covered on the timeline.

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Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. *(CLE 3102.1.7, CLE 3102.2.1, CLE 3102.3.6, CLE 3102.3.1, CLE 3102.3.5, CLE 3102.3.6, CLE 3102.3.9, CLE 3103.1.7, CLE 3103.2.3, CLE 3108.1.7,)*

Learning Expectations:

The student will

    3.1   Develop a detailed logic plan using a flowchart.
    3.2   Demonstrate the use of Pseudocode.
    3.3   Apply the concepts and principles of object-oriented programming.

Student Performance Indicator: Evidence Standard Is Met

The student:

- ➢ Diagrams a sequence of steps using program development tools.
- ➢ Designs a series of classes to describe diverse systems.

Sample Performance Task

The student will produce a detailed logic plan using the programming development tools.

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Standard 4.0

The student will write and document an executable program with high level languages such as *Java, C++,* and *BASIC* using best coding practices.

Learning Expectations

The student will:

4.1   Identify names for variables and their data types.
4.2   Recognize and apply the symbols for mathematical operations.
4.3   Demonstrate the various methods of obtaining input/output and formatting output.
4.4   Analyze the task and implement a detailed logic plan.
4.5   Demonstrate the use of control statements.
4.6   Identify, illustrate, and perform operations using arrays.
4.7   Identify and apply virtual functions and polymorphism.
4.8   Read and/or write data files for input/output purposes.
4.9   Debug the program and verify the output of the program.
4.10 Show proper documentation, formatting, and commenting of source code.
4.11 Design a program that makes extensive use of event driven, exception handling.
4.12 Create a program from an object-oriented design specification.

Student Performance Indicator: Evidence Standard Is Met

The student:

➢   Given a task, develop a detailed logic plan that uses appropriate input/output methods, variables, symbols, and appropriate uses.
➢   Writes an executable program using control statements, arrays, and functions from an object-oriented design specification
➢   Writes input/output data files.
➢   Troubleshoots high level languages such as *Java, C++, and BASIC.*
➢   Creates a program that handles exceptions.

Sample Performance Task

➢   Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successful operation of the program.

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Standard 5.0

The student will work as a team member to develop integrated application using high level languages such as *Java, C++, and BASIC.*

Learning Expectations

The students will:

5.1 Define the role of each team members.
5.2 Solve a complex task using high level languages such as *Java, C++,* and *BASIC.*
5.3 Compare and contrast the advantages of working as a group.

Student Performance Indicator: Evidence Standard Is Met

The student:

➢ Works as a member of team to solve a complex task using high level languages such as *Java, C++,* and *BASIC* and presents the solution of the task.

Sample Performance Task

➢ Each team will write a program to solve a complex task using high level languages such as *Java, C++, and BASIC.* The problem to be solved by each team will be determined by the team members. Evaluation will be the successful operation of the program.