Software Development

Syllabus | 2021-2022 |#10154G1000 - One Credit

Instructor: Carmanita Monroe **Email:** cmonroe@bessk12.org **Phone:** 205-432-3777

COURSE DESCRIPTION:

Software Development is a one-credit course designed to provide students with an introduction to the C++ programming language, structured elements of C++, classes, data, abstractions, inheritance, polymorphism, storage management, and a C++ programming environment. This course contains many simple programming exercises to reinforce the theory and to stimulate understanding.

PREREQUISITES: Information Technology Fundamentals **COURSE FEE:** $30

CAREER CLUSTER: Information Technology **CAREER PROGRAM:** Programming and Software Development

LAB APPLICATION:

Microsoft Visual Studio Community
https://visualstudio.microsoft.com/vs/community/

TEXTBOOK:

Microsoft Official Academic Course
Software Development Fundamentals Microsoft Technology Associate EXAM 98-361

WEBSITE:

Links to all course technologies will be available on the Bessemer Center for Technology website here:
https://technologybessemeral.schoolinsites.com/

EMAIL:

All students are required to use their school email to access the course technologies we will use.

PROGRAM/INSTRUCTIONAL DELIVERY PLAN:

Students will be expected to meet all of the course goals listed below and demonstrate an understanding of the underlying concepts. The instruction will be cooperative learning, application-based, with a minimum of lecture and demonstration. This course requires research, experiments, and hands-on application. Students will complete several projects that enable them to work in groups and independently. **Assignments will require that students draw upon academic skills in math, science, English, and reading.**

GENERAL SUPPLIES:

- Notebook
- Pen or Pencil (Mechanical or Standard)
- Highlighters

ADDITIONAL RECOMMENDED SUPPLIES: These supplies would be used to organize lessons, fact sheets, and lab printouts from the textbook for test preparation and as a reference in a Software Development career.

- 5" or 6" Three-Ring Binder
- Dividers or Post It Tabs
- Sheet Protectors
- College ruled filler paper

CAREER AND TECHNICAL STUDENT ORGANIZATION (CTSO):

SkillsUSA - $15 Membership Fee (included in Course Fee)

Various CTSO activities are integrated into the course to prepare students for SkillsUSA competitions.

All Software Development students are required to join and participate in SkillsUSA. SkillsUSA is a professional organization designed to be run by students as an integral, co-curricular component of career and technical courses. SkillsUSA members develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for

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professional growth. Through chapter meetings, contests, leadership conferences, and activities, students will build these skills. Each chapter chooses plans and conducts its operations.

AVAILABLE INDUSTRY-RECOGNIZED CREDENTIALS:

Microsoft Technology Associate 98-361: Software Development Fundamentals

DUAL ENROLLMENT:

Dual enrollment is available for some programs through Lawson State Community College.

GRADING AND EVALUATION CRITERIA:

Assessments: Grades will be based on quizzes, midterm, and final examinations. Exams are cumulative and given in a variety of formats. An in-class review will be held before each exam.

Classwork/Participation: Grades will be based on keyword terms, review questions, critical thinking, weekly objectives, bell ringers, exit tickets, etc.

Projects/Anchor Assignments: Students will engage in project-based learning independently and as a group. Grades will be based on the understanding and execution of the project objectives, including literacy, numeracy, and writing.

Hands-on/Virtual Labs: Labs allow students to demonstrate their understanding and application of real-world skills. Grades will be based on students' participation and completion of each lab.

The following scale will be used in assessing the student's content knowledge and skills during the course:

EVALUATION CRITERIA:	PERCENTAGE:	GRADING SCALE:	LETTER GRADE:
Assessments	25	100 – 90	A
Classwork/Participation	25	89 – 80	B
Projects	25	79 – 70	C
Labs	25	69 – 60	D
TOTAL	**100**	Below 59	F

CLASS POLICIES:

1. Eating and drinking are NOT permitted in the computer lab or classroom.
2. Students are not to tamper with computers in any way nor to make changes in setup unless directed by the instructor. Any students performing unauthorized actions on computers will be subject to disciplinary action.
3. Sufficient time will be allowed in the classroom to complete the work assigned.
4. Students must leave the work area clean, neat, and ready for the next class. Also, students are to return any textbooks to the book bin and shut down the computer before leaving the classroom.
5. School policies will be followed.

MAKE-UP POLICY:

Students are responsible for informing the instructor within one week after returning that they need to make up assignments or tests. Failure to do so will result in a zero being assigned for the missed work.

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COURSE GOALS:

1. Analyze customer software needs and system requirements to design an information technology-based project plan.
2. Utilize research results to assist in designing an information technology-based project plan with strategies for solving specific problems.
3. Analyze quality assurance tasks to produce quality products.
4. Evaluate maintenance and customer support functions.
5. Demonstrate the effective use of tools for software development.
6. Relate program structure, blocks, and storage types to C++.
7. Construct console and file input and output, functions, arrays, and strings.
8. Develop a software program.
9. Differentiate between C++ and C programming languages.
10. Design a simple program that incorporates mathematics by writing the code, performing unit testing, and debugging the program.
11. Demonstrate career and entrepreneurial opportunities, responsibilities, and educational and credentialing requirements in the software development industry.

ESSENTIAL QUESTIONS:

- How would you define the roles of the potential parties, e.g., steering committee, client sponsor, project manager, technology team, company employees, etc., involved in an information technology-based project plan?
- What are the procedures for identifying software needs and system requirements to design an information technology-based plan?
- How would you create a cost budget for an information technology-based project plan?
- What are the considerations to facilitate the development of a timeline for an information technology-based plan?
- How can research results be used to assist in designing an information technology-based project plan with strategies for solving specific problems?
- What are the quality assurance tasks needed to produce quality products?
- How can maintenance and customer support functions be evaluated?
- What are the differences between C and C++ and why are those differences significant?
- How would you use inheritance and polymorphism to design a class hierarchy?
- What considerations are involved in using data abstraction and encapsulation in designing a class?
- How are mathematical operations used to design algorithms?
- What are the types of errors and the procedures for detecting and fixing them?
- How do functions work with respect to parameters, arguments, return statements, return types, and return values?
- What is the software engineering process and how does it apply in the case of C++ with respect to the reuse of code?
- How would you proceed to solve a business problem using C++?
- What are the considerations in writing and using class constructors?
- How do you create documentation and structure programs for readability?
- What are options for input/output with both the console and data files including the use of strings?

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- How do occupations rely on or utilize C++ as an important development or design proficiency?
- What are the job requirements for occupations that use C++ software development skills?
- How would you define your responsibilities in jobs that use C++ software development skills in a work environment dedicated to solving business problems?
- What prospective entrepreneurial opportunities could you consider that use C++ software development skills?
- How can you approximate your greatest interests with respect to occupations?
- What are the credentials that fit a student's goals and the relevant requirements?

COURSE OUTLINE:

Module		Unit Topic
0		**Course Orientation**
1		**Career Opportunities** • Employment and Careers, Job Demand by Industry, Requirements for Software Development career • Professional Communication
2		**Customer Service** • Customer Software Needs • Research to Assist in Designing • Quality Assurance • Evaluation and Maintenance
3		**Software Design** • Effective Tool Use of Software Development Tools • Program Structure, Blocks, and Storage Types • Console, File input/output, Functions, Arrays, Strings • Developing a Software Program • Differentiate between C++ and C programming languages • Designing Programs that incorporate mathematics

CULMINATING PRODUCTS:

1. Knowledge gained from simulating and revising an information technology-based plan.
2. Programs modified, written, and documented. Exercises and projects performed, executed, and assessed.
3. Additions to portfolios and student confirmation of and enthusiasm for a prospective career using software development with C++ Skills.

NON-DISCRIMINATION STATEMENT

The Bessemer City School System does not discriminate on the basis of race, color, national origin, sex, disability, and, or religion in its programs and activities and provides equal access to the Boy Scouts and other designated youth groups.
The following person has been designated to handle inquiries regarding the non-discrimination policies:
Dr. Jameka Thomas, Section 504 and Title IX Coordinator
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