

James Clemens High School

11306 County Line Road
Madison, AL 35756



Phone: 256-216-5313

Extension: 95222

Email: kgbrown@madisoncity.k12.al.us

Course Description: Object-oriented programming I is designed to provide students with a conceptual understanding of OOP, a programming paradigm that relies on the concept of classes and objects. It is used to structure a software program into simple, reusable pieces of code blueprints (usually called classes), which are used to create individual instances of objects. It emphasizes the fundamentals of computer programming. Topics include technical knowledge, programming foundations, program documentation, program design and development, compilation and debugging, and practical experience in programming, using modern, object-oriented languages. This course extends the standards of the *Alabama Course of Study: Digital Literacy and Computer Science*.

Pre-Requisites:

Programming Foundations

Credentialing (subject to change):

C++ Certified Entry-Level Programmer (CPE)

Grading and Assessment: Test grades will account for 70% of the 9-weeks grade, with the remaining 30% being determined by quiz/daily grades. The grading scale is as follows: A (90-100%), B (80-89), C (70-79), D (65-69), and F (below 65). Grades will be a reflection of mastery of the standards. Make sure all absences are excused as class work can be made up and graded for excused absences only. The final exam counts for 20% of the final grade.

Not all assignments will be graded, but students must complete all work. Students will take notes via guided notes, graphic organizers, and other methods in this course. If a student is absent, their missed printed materials will be located in their class folder. Students are responsible for checking this folder. My office hours will be every Tuesday and Thursday during the first half of refuel.

Late Work: Per JCHS Policy, all late work is to be made up within 3 days of excused absence(s). It is the student's responsibility to see what they have missed and to turn in by the third day. If they do not turn in the work within 3 days then it will become a zero. If you missed a test or quiz, you must communicate this with me ahead of time. Typically, all make-up tests/quizzes will be held during refuel on Wednesday or Friday. If there is a conflict, it is the student's responsibility to schedule another time together to make-up the test or quiz.

TSA (Technology Student Association) CTS Integration: Technology Student Association is a National Career Technical organization where students can use knowledge gained from computer science courses. JCHS's TSA team competes at Alabama TSA convention every year and students from this course can choose to register and attend.

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Embedded Numeracy, Literacy, & Science Anchor Assignments: Opportunities for numeracy, literacy, and science in the CTE class are critical and help support the goals of CTE in preparing students for college and/or career. There will be several Anchor assignments throughout the course that students will complete. Example anchor activities for mathematics and science include performing various computer science-related calculations and analyzing data collected when conducting research. Some examples but not limited to include interviewing a computer science engineer or other professional, investigating various STEM/Computer Science related fields and describing their responsibilities and the requirements to be successful in the field by writing a design brief, reflection paper, or other technical report on this field.

Accommodations: Requests for accommodations for this course or any school event are welcomed from students and parents.

Turnitin Notice: The majority of writing assignments in this course will be submitted to Turnitin via the Schoology learning platform. The primary focus of this software is to help students become better writers and scholars. Turnitin generates a report on the originality of student writing by comparing it with a database of periodicals, books, online content, student papers, and other published work. This program will help students discern when they are using sources fairly, citing properly, and paraphrasing effectively - skills essential to all academic work.

Students will have the opportunity to review their Turnitin originality report and will have the opportunity to make revisions before submitting their work for grading. Once their work is submitted, teachers have the opportunity to view the student's originality report and grade accordingly.

Supplies:

3 Ring Binder	Pencils
Loose Leaf Paper	Calculator (Optional)

Procedures & Rules:

Rules and Procedures will be discussed on the first day of class, but the main rules are as follows.

1. BE RESPONSIBLE FOR YOUR OWN LEARNING.
2. BE ON TIME and BE PREPARED.
3. ALWAYS TREAT OTHERS WITH RESPECT. WE DO NOT MAKE OFFENSIVE JOKES IN CLASS.
4. DO NOT THROW THINGS ACROSS THE ROOM.
5. DO NOT SPEAK OVER ME WHEN I AM TEACHING.
6. DO NOT LEAVE MATERIALS OR YOUR THINGS ON MY TABLES WHEN YOU LEAVE.
7. CHECK BACK OF THE ROOM BOARD FOR WEEKLY ASSIGNMENTS/QUIZZES/TESTS.
8. ONE PERSON OUT OF THE CLASSROOM FOR BATHROOM AT A TIME.

Technology in the Classroom:

- WE WILL USE ASSIGNED LAPTOP EVERY DAY. THESE LAPTOPS MUST STAY IN MRS. BROWN'S ROOM
- You should know when it is appropriate to use your phone and when it is not.
- No phones out during presentations, but you can use them for quick googling.

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Computer/Internet Appropriate Use Policies: Student laptops should not be hard-wired to the network or have print capabilities. 2. Use of discs, flash drives, jump drives, or other USB devices will not be allowed on Madison City computers. 3. Neither the teacher, nor the school is responsible for broken, stolen, or lost laptops. 4. Laptops and other electronic devices will be used at the individual discretion of the teacher.

Instructional Delivery Plan

18 - WEEK PLAN*	
WEEK 1	Unit 1 Basic C++ Syntax, Variables, Data Types, cin/cout, etc
WEEK 2	Unit 1 Basic C++ Syntax, Variables, Data Types, cin/cout, etc
WEEK 3	Unit 2 Compound, Comparison, & Special Assignment Operators, Boolean, If/Else, Switch, Loops (While, For, Do-While)
WEEK 4	Unit 2 Continued & Unit 3 Nested Loops
WEEK 5	Unit 3 Nested Loops
WEEK 6	Unit 4 Functions (Void, Return Value, & Recursive Functions)
WEEK 7	Unit 4 Functions (Overloaded Functions), Pass by Reference vs Pass by Value
WEEK 8	Unit 5 Arrays (1D Arrays)
WEEK 9	Unit 5 Arrays (2D Arrays)
WEEK 10	Unit 5 Continued & Unit 6 OOP, Strings, Classes
WEEK 11	Unit 6 OOP, Strings, Classes
WEEK 12	Unit 7 Vectors
WEEK 13	Unit 7 Vectors & Unit 8 Inheritance
WEEK 14	Unit 8 Inheritance
WEEK 15	Unit 8 Inheritance & Polymorphism
WEEK 16	Unit 9 Links, Stacks, Queues, & Overloaded Operators
WEEK 17	Final Project
WEEK 18	Overall Semester Review

* This syllabus serves as a guide for both the teacher and student; however, during the term it may become necessary to make additions, deletions or substitutions.



Course Goals/ Objectives

Foundational Standards

- Foundations in programming
- Introduction to safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and handling hazardous materials and forces.
- Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.
- Explore the range of careers available in the field and investigate educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.
- Advocate and practice safe, legal, responsible, and ethical use of information and technology tools pacific to the industry pathway
- Increase knowledge and skills to enhance leadership and teamwork (CTSO)
- Use technology to collaborate with peers and/or experts to create digital artifacts that can be published online for a target audience
- Formulate new ideas, solve problems, or create products through the design and engineering process by utilizing testing, prototypes, and user feedback.

Object-Oriented Programming Foundations

- Describe the use of a main method in an application.
- Perform basic input and output using standard input and output streams.
- Evaluate the scope of a variable and declare a variable within a block, class, or method.

Technical Knowledge

- Describe the differences between structured programming and object-oriented programming (OOP).

Compilation and Debugging

- Troubleshoot syntax errors, logic errors, and runtime errors.
- Utilize debugging tools to suspend program execution and to examine, step through, and reset execution of code.
- Utilize common error recovery strategies to detect errors and write a strategy to implement and handle the error.

Professional Skills

- Team collaboration
- Project management
- Problem-solving
- Communication skills
- Presentation skills
- Technical writing

Object-Oriented Language-Specific Basics

- Define the inputs and outputs of a computer program.
- Declare and use primitive data type variables
- Identify precision loss in primitive data types.
- Explain how primitives differ from wrapper object types.
- Outline and explain the logical steps necessary for the development of a computer program.
- Create a basic algorithm using plain language (pseudocode).
- Use flowcharts to represent logic graphically.
- Explain the basic functions of the integrated development environment (IDE)

Object-Oriented Language-Specific Syntax

- Describe the functions of different objects and their purposes in a program.
- Describe the function and purpose of a computer program event procedure.
- Write property assignment statements in computer code.
- Utilize comments in the program code to document the logic and enhance the readability of the code.
- List and explain computer program operator types and the precedence (order of operation) of program operators.
- Differentiate between commands and statements in computer programming.
- Write valid declaration statements using an approach to global static scope with appropriate data types, including constants, variables, and logical reasoning.

Practical Programming

- Construct a program that will perform calculations on a set of given data.
- Generate random numbers through the use of built-in functions in a program.
- Utilize accumulators and counters in a program.
- Identify and utilize various looping and iteration structures that control the flow of a program.
- Utilize built-in properties and functions to manipulate classes and structures within a program.
- Describe the purpose and function of a class.
- Construct and evaluate class definitions.
- Describe the purposes and functions of general sub procedures in a program.
- Explain the uses of parameters and arguments and how they control the flow of a program.
- Create a program using one or more classes and/or functions.
- Create a program using a general sub procedure passing arguments to another sub procedure.
- Construct and evaluate code that uses branching statements.
- Construct and evaluate code that uses loops.
- Declare, Implement, and access methods.

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