WARREN COUNTY SCHOOL DISTRICT
Planned Instruction

Course Title: Computer Science_____

Course Number: 00288_____

Suggested Educational Level(s): 10-12_____

Suggested Periods Per Week: 5_____ **Length of Period**: 40 minutes___

Suggested Length Of Course: 180 days_____

Units Of Credit (If Appropriate): 1_____

Date Written: March 1, 2000_____ **Date Approved**: August 8, 2005_____

Date Reviewed: July 20, 2005_____ **Implementation Year**: 2005-2006_____

Teacher Certification Required: BS/BA Secondary Education/Mathematics

Standards Addressed (code):   2.1.11   2.4.11
                                      2.2.11   2.5.11
                                      2.3.11   2.8.11

Relationship to Other Planned Instruction:
This is the introductory course for programming and is the prerequisite for students wanting to take AP Computer Science.

Prerequisites: successful completion of Algebra I or Applied Algebra I

Special Requirements:
Students will have individual access to a classroom computer with a system that is capable of compiling large programs in a matter of second.

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Standards addressed (code and description):

2.1.11 Numbers, Number Systems and Number Relationships
2.2.11 Computation and Estimation
2.3.11 Measurement and Estimation
2.4.11 Mathematical Reasoning and Connections
2.5.11 Mathematical Problem Solving and Communication
2.8.11 Algebra and Functions

COURSE DESCRIPTION

This course is designed as an introductory course in Computer Science. Because the development of computer programs to solve problems is a skill fundamental to the study of computer science, a large part of the course is built around the development of computer programs or parts of programs that correctly solve a given problem. It emphasizes object-oriented programming methodology, as well as the design issues that make programs understandable, adaptable, and when appropriate, reusable. At the same time, the development of useful computer programs and classes is used as a context for introducing other important concepts in computer science, including the development and analysis of algorithms, the development and use of fundamental data structures, and the study of standard algorithms and typical applications.

Outline of Content Sequence and Recommended Time (weeks or days):

5 days	I.	Introduction to Computers and Programming Languages
5 days	II.	Software Development
20 days	III.	Classes, Objects, and Events
20 days	IV.	Math Operations and Logic
30 days	V.	Iterative Statements
35 days	VI.	Methods, Constructors, and Fields
20 days	VII.	Arrays
20 days	IX.	Object-Oriented Programming
10 days	X.	Review and test strategies
180 days		

Specific Educational Objectives to be Taught:

I. Introduction to computers and programming languages (2.4.11B; 2.5.11B)
• The history of computers
• Ethical use of computers
• Computer hardware
• Binary representation

II. Software development (2.4.11E; 2.5.11B)

- Programming languages
- Introduction to software development
- Algorithms
- Compilers and interpreters

III. Classes, objects and events (2.4.11B,C; 2.5.11B; 2.8.11R)
- Data types
- Using variables
- Classes and objects
- Syntax and semantics
- Editing, compiling and testing
- Debugging
- Comments

IV. Math operations and logic (2.1.11A; 2.2.11 A; 2.4.11E; 2.5.11C; 2.8.11B)
- The fundamental operators
- Order of operations
- Logical operators
- If...else statements
- If...else...if statements and nested if...else statements

V. Iterative statements (2.4.11C; 2.5.11B,C)
- While loop
- For loop
- Do...while loop
- Nested loops
- Break...return loop

VI. Methods, constructors and fields (2.4.11C,E; 2.5.11C,D)
- Defining methods
- Overloaded methods
- Constructors
- Creating objects using constructors
- Static fields and methods
- Calling methods and accessing fields
- Passing arguments to methods and constructors
- Return statement
- Public and private fields and methods
- String and character methods

VII. Arrays (2.4.11B,C; 2.5.11D)
- Simple array manipulations
- Looping through arrays

- Declaring arrays
- Working with arrays that are not full
- Parallel arrays
- Two-dimensional arrays
- Arrays and methods
- Arrays of objects
- Searching and sorting
- Working with arrays of objects

VIII. Graphics (2.4.11E; 2.5.11B)
- Paint, paintComponent, and repaint
- Coordinates
- Colors
- Drawing Shapes
- Fonts and Text

IX. Object-oriented programming (2.4.11A; 2.5.11D)
- Objects as independent agents
- Inheritance and class hierarchies
- Encapsulation and information hiding
- Polymorphism
- Designing classes and methods

Summative Assessments:
On a yearly basis, a team comprised of representatives of the Warren County School District teachers currently teaching the course and the Math Coordinator, will develop a summative assessment.

Required/Approved Textbooks and Materials:
Book Title: Computing Concepts With Java Essentials
Publisher: John Wiley & Sons, Inc.
ISBN #: 0-471-24371-X
Copyright: 2003
Date of Adoption: August, 2004
Additional Resources:
Book Title: Java Methods, An Introduction to Object-Oriented Programming
Publisher: Skylight Publishing

Book Title: Introduction to Computer Science Using Java
Publisher: Glencoe/McGraw Hill Publishing Co.

Book Title: Fundamentals of Java, Second Edition
Publisher: Southwestern Publishing Co.