Computer Programming

COURSE OUTLINE

1. Course Title: Computer Programming
2. CBEDS Title: Computer Programming
3. CBEDS Number: 4631
4. Job Titles: Computer Operators
Computer Support Specialists
Computer Systems Analysts

5. Course Description: This course is designed as a general introduction to the rapidly expanding field of computer science. Through the use of the Visual Basic programming language, students will perform the basics of computer programming including methodologies, structures, and user interfaces, as well as more advanced programming concepts like searching, sorting, and object-oriented programming. Other programming languages, such as C++ and Java, may be included for individual or group projects. This course is designed for students seeking to further develop their computer skills and requires good math skills.

Student Outcomes and Objectives:

Students will:

1. Develop the ability to write computer programs in Visual Basic.
2. Use principles of software design to analyze programming problems and develop solutions.
3. Compare values and perform alternative operations based upon the results of the comparison.
4. Identify the proper structure of loops.
5. Demonstrate the use of arrays.
6. Demonstrate the use of strings.
7. Create and test computer programs that incorporate control structures, and object-oriented programming methods.

Pathway

Recommended Sequence	Courses
Introductory	Computer Foundations
Skill Building	Computer Applications in Business 1 or **Computer Programming**
Advanced Skill	Multi Media & Desktop Publishing or Computer Applications in Business 2

6. Hours: *Students receive up to 180 hours of classroom instruction.*

7. Prerequisites: Computer Applications in Business 1
8. Date (of creation/revision): July 2010

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Upon successful completion of this course, students will be able to demonstrate the following skills necessary for entry-level employment.

Instructional Units and Competencies Guaranteed curriculum = regular font Negotiated curriculum = italicized	**Course Hours**	**Model Curr. Standards**	**CA Academic Content Standards**	**CAHSEE**
I. CAREER PREPARATION A. Career Planning and Management. 1. Know the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers. a. Students will identify skills needed for job success b. Students will identify the education and experience required for moving along a career ladder. 2. Understand the scope of career opportunities and know the requirements for education, training, and licensure. a. Students will describe how to find a job. b. Students will select two jobs in the field and map out a timeline for completing education and/or licensing requirements. 3. Know the main strategies for self-promotion in the hiring process, such as completing job applications, resume writing, interviewing skills, and preparing a portfolio. a. Students will write and use word processing software to create a resume, cover letters, thank you letters, and job applications. b. Students will participate in mock job interviews. 4. *Develop a career plan that is designed to reflect career interests, pathways, and postsecondary options.* *a. Students will conduct a self—assessment and explain how professional qualifications affect career choices.* *5. Understand the role and function of professional organizations, industry associations, and organized labor in a productive society.* *a. Contact two professional organization and identify the steps to become a member.* *6. Understand the past, present and future trends that affect careers, such as technological developments and societal trends, and the resulting need for lifelong learning.* *a. Students will describe careers in the business industry sector.* *b. Students will identify work-related cultural differences to prepare for a global workplace.* B. Technology. 1. Understand past, present and future technological advances as they relate to a chosen pathway and on selected segments of the economy. 2. Understand the use of technological resources to gain access to, manipulate, and produce information, products and services. 3. Use appropriate technology in the chosen career pathway. C. Problem solving and Critical Thinking. 1. Understand the systematic problem-solving models that incorporate input, process, outcome and feedback components, and apply appropriate problem-solving strategies and critical thinking to work-related issues and	20 Additional hours are integrated throughout the course.	Information Technology Industry Sector, Model Curriculum Standards 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0	Language Arts (8) R 1.3, 2.6 W1.3, 2.5. LC 1.4,1.5, 1.6 LS1.2, 1.3, (9/10) R2.1,2.3,2 W2.5 LC1.4 LS 1.1, 2.3 (11/12) R2.3 W2.5 LC1.2 Math (7) NS1.2, 1.7 MR 1.1,1.3 2.7,2.8, 3.1	Lang. Arts R 8.2.1 (9/10) R 2.1, 2.3 W2.5 Math (7) NS 1.2, 1.3, 1.7 MR 1.1, 2.1, 3.1

tasks. 2. Use and apply critical thinking and decision making skills to make informed decisions, solve problems, and achieve balance in the multiple roles of personal, home, work and community life. D. Health and Safety. 1. Know policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities. 2. Understand critical elements of health and safety practices related to a variety of business environments. E. Responsibility & Flexibility. 1. Understand the qualities and behaviors that constitute a positive and professional work demeanor. 2. Understand the importance of accountability and responsibility in fulfilling personal, community, and work-place roles and how individual actions can affect the larger community. 3. Understand the need to adapt to varied roles and responsibilities. F. Ethics and Legal Responsibilities 1. Know the major local, district, state, and federal regulatory agencies and entities that affect the industry and how they enforce laws and regulations. 2. Understand the concept and application of ethical and legal behavior consistent with workplace standards. *a. Contact a business and obtain a copy of their rules for employment.* *b. Role play difference ethical scenarios.* 3. Understand the role of personal integrity and ethical behavior in the workplace. G. Leadership and Teamwork. 1. Understand the characteristics and benefits of teamwork, leadership, citizenship in the school, community, and workplace settings for effective performance and attainment of goals. 2. Understand the ways in which professional associations and competitive career development activities enhance academic skills, career choices, and contribute to promote promote employability. 4. Know multiple approaches to personal conflict resolution and understand how to interact with others in ways that demonstrate respect for individual and cultural differences and for the attitudes and feelings of others.				

Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
I. Know what a computer is and the process of writing and executing a computer program. A. Basic data processing cycle – input, process, and output B. Function of a computer program C. Operational capabilities of a computer system – input/output, arithmetic, and logical operations D. SAVE, LOAD, EDIT, KILL AND DIRECTORY		Information Technology Industry Sector Foundation Standards 4.1, 4.2, 4.5 5.1, 5.2, 5.3 8.5 10.6, 10.7, 10.8 Programming & Systems Development PW D1.1 D1.2 D2.1, 2.2, 2.3 D3.1, 3.3, 3.4 D5.4	M8-12 (1.1) (15.0 (24.2) (25.2) (25.3) SCI9-12 (1.a) (1.b) R9-10 (2.6) W9-11 (1.3) W11-12 (1.6)	**(10)R2.8** **(10)WS1.5** **(7)MR1.1** **MR1.2** **MR2.3** **MR2.4**
II. Understand the elements of the BASIC language required to implement the logic o computer programming. A. Program development and coding process B. Logic required to create a list in information using a simple loop C. BASIC statements: REM, DTA, READ, IF, PRINT, GOTO, AND END D. Numeric and string variables and contents E. Programming techniques, including program comments and proper indentation of the source code				
III. Understand how to perform arithmetic operations, semicolon and tab functions. A. Perform arithmetic operations B. Round numeric values C. Print using statements for editing fields D. Tab statement for controlling output E. Design a program requiring calculations, accumulations, and printing final totals.				
IV. Compare values and perform alternative operations based upon the results of the comparison. A. If-then-else logic structure including nesting B. Single entry/single exit rule for if-then-else logic structure C. BASIC if statement and how it is written D. Relational operators E. Difference between string comparisons and numeric comparisons F. Logical operators AND, OR, and NOT G. Internally storing numeric data and considerations when comparing this data				

Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
V. Understand the proper structure of loops. A. Interactive process B. Input statement C. Loops and the Loop logic structure D. For and next statements for loops				
VI. Arrays. A. Define and load arrays B. Search sequentially of an array for a known value and extract the corresponding element from another array C. Binary search techniques D. Load multi-dimension arrays				
VII. Menus, subroutines, and sorting techniques. A. Menus in interactive programming B. Design and code programs using the case structure C. Subroutines D. Sorts and design and exchange sort E. Design a program by decomposing the program into a series of functional modules				
VIII. Understand and use strings. A. Create a personalized letter using string functions B. Edit input data using the string functions C. String functions available with BASIC interpreters D. Search strings for delimiters and substrings E. Design process for programs requiring numerous modules				
IX. Use files, report generation, and functions in designing programs. A. Trig functions and other functions of the BASIC language B. Control break process and logic required to produce a control break report				
X. Creating graphic designs. A. Character strings B. Read data commands C. Set-Reset and Poke-Peek commands				

10. Additional recommended/optional items
    a. Articulation: Formalized articulation agreements should be mentioned.
    b. Academic credit:
    c. Instructional strategies:
        Methods of Instruction:
            1) Demonstration
            2) Group & Individual Activities
            3) Quizzes, Tests & Final Exam
            4) Internet Exploration
    d. Instructional materials:
    e. Certificates: