Date Approved by DJUSD Board of Education: _____

Secondary Course Description

Course descriptions are updated and reviewed with all new text adoptions.

COVER PAGE

1. Course Title: Computer Programming and Applied Problem Solving

2. Transcript Title / Abbreviation:

3. Transcript Course Code / Number (Office Use Only):

4. School: Davis Senior High School

5. **District**: Davis Joint Unified School District

6. Department: CTE

7. Graduation Requirement it meets: Elective, CTE

8. Length of Course: 1 year

9. Graduation Credits: 10

10. School / District Web Site: http://www.djusd.net

11. CBEDS Course Code:

12. School Contact:

Name: Kevin Anderson

Title/Position: Teacher

Phone: 530-757-5400 **Ext.:**

Fax:

E-mail: kanderson@djusd.net

13. Subject Area:

- [ ] History/Social Science
- [ ] English
- [ ] Mathematics
- [ ] Science
- [x] CTE
- [ ] Language other than English
- [ ] Visual & Performing Arts
- [ ] DJUSD Graduation Elective
- [x] College Prep Elective (will seek UC/CSU approval)

14. Grade Level(s): 9-12

15. UC/CSU Requirement:

16. Seeking "Honors" Distinction? [ ] Yes [x] No

17. GPA Types:

18. Credit Value:

- [ ] 0.5 (half year or semester equivalent)
- [x] 1.0 (one year equivalent)
- [ ] 2.0 (two year equivalent)
- [ ] Other: _____

19. Was this course previously approved by UC? [x] Yes [ ] No

If so, in what year? 2014 **Under what course title?** _____

20. Pre-Requisites: Integrated Math I and Internet Engineering I

Co-Requisites:

21. Preliminary Approval - Secondary Site Principal Signature (Must be signed before proceeding to Step 22):

_____

22. Date Course Proposal with Preliminary Approval (Step 15) sent to Associate Superintendent, Educational Services: _____

23. Review & Approval:

Date		Signature
_____	**Site Curriculum and Instruction Leadership Team**	**Signature/Title** _____
_____	**Secondary Department Articulation/Collaboration**	**Signature/Title** _____

Secondary Principal Signatures: _____ _____

Date: _____ _____

BACKGROUND INFORMATION

Brief Course Description:

This course provides students with the fundamental knowledge of computer programming for solving applied problems in C. A user-friendly RoboBlockly and C/C++ interpreter Ch will be used for learning computational thinking and software development. Students learn how a computer works and structured programming in C for software development. The topics include programming constructs, data types and declaration of variables, expressions and operators, selection statements, repetition, flowcharts for algorithm development, functions for modular programming, arrays for statistical data analysis, plotting for visualizing data (using scatter plot, dot plot, bar graph, histogram, Box-and-Whisker plot, etc.), linear regression and curve fitting, processing data files, animation, robotics applications, and applications in math and science. The emphasis of the course is to introduce the students to software development concepts. This course also focuses on algorithm development and computer programming for solving applied problems in science, technology, engineering and math (STEM), such as solving problems in Algebra and robotics. Considerable attention is devoted to program design, task decomposition, testing, debugging, and software reuse. Students write computer programs with graphical plotting in an integrated development environment. Through problem-based projects, students develop critical thinking, problem solving, computational thinking, effective communication, and teamwork skills.

Context for Course:

List the State/District Standards addressed in this course.

History of Course Development:

COURSE GOALS AND/OR MAJOR STUDENT OUTCOMES

COURSE OBJECTIVES

COURSE OUTLINE

Content Standards	Key Assignments
Introduction to Programming, Variables, Data Types, and Input/Output	
Operators and Expressions	
Flowcharts, Decision Making, Loops, and Random Numbers	
Modular Programming with Functions	
Arrays for Processing, Organizing, and Displaying Data	

TEXTS AND SUPPLEMENTAL INSTRUCTIONAL MATERIALS

Title, Author, Publisher, Edition:

Title: Learning C Programming: An Introduction to Computer Science
Edition: 1st
Publication Date: August 2014
Publisher: UC Davis C-STEM Center
Author(s): Harry H. Cheng
URL Resource(s): http://c-stem.ucdavis.edu

Previously Adopted? ☐ **Yes** ☐ **No (If no, provide information directly below)**

Cost per book	Total Cost	Budget Source

Other:

Software: Ch Professional Edition
Developer: SoftIntegration, Inc.
Website: http://www.softintegration.com/download/
Software: C-STEM Studio
Developer: UC Davis C-STEM Center
Website: http://c-stem.ucdavis.edu/downloads/
Software: Linkbot Labs
Developer: Barobo, Inc.
Website: http://c-stem.ucdavis.edu/downloads/
Title: C for Engineers and Scientists: An Interpretive Approach
Edition: 1st
Publication Date: 2010
Publisher: UC Davis C-STEM Center
Author(s): McGraw Hill
URL Resource(s): http://iel.ucdavis.edu/cfores/
Title: Learning Computer Programming with Ch for the Absolute Beginner
Edition: 1st
Publication Date: May 2016
Publisher: UC Davis C-STEM Center
Author(s): Harry H. Cheng
URL Resource(s): http://c-stem.ucdavis.edu
Title: Learning Robotics with Linkbot for the Absolute Beginner
Edition: 6th
Publication Date: May 2016
Publisher: UC Davis C-STEM Center
Author(s): Harry H. Cheng
URL Resource(s): http://c-stem.ucdavis.edu
Title: Learning Common Core Mathematics with C/C++ Interpreter Ch for Integrated Mathematics 1 Edition:
Publication Date: June 2016
Publisher: UC Davis C-STEM Center
Author(s): Harry H. Cheng
URL Resource(s): http://c-stem.ucdavis.edu

DIFFERENTIATED INSTRUCTIONAL METHODS AND/OR STRATEGIES

ASSESSMENT METHODS AND/OR TOOLS

ASSESSMENT CRITERIA

HONORS COURSES ONLY

Indicate how this honors course is different from the standard course.