STATEMENT OF INTENT

This agreement enables students to receive college credit and/or a waiver of a prerequisite for coursework at the secondary level comparable to courses offered by Mt. San Jacinto College District. The granting of college Credit-by-Exam is based upon achievement of competencies through a course or courses as defined in the current Articulation Handbook, which specifies the conditions of the articulation agreement.

TERMS OF AGREEMENT

This agreement between Mt. San Jacinto College District and High Schools or ROP shall remain valid for up to three years for all disciplines [*except child development education (TEDS) which are valid for two years*]. After this time period, the agreement must be renewed by the K-12 District. This renewal will include an examination of up-to-date course outlines, a discussion of current teaching methods, stated competencies, and measurement methods. Either party to the agreement may terminate this agreement at the close of any school year by proper written notice delivered to the Superintendent/President of Mt. San Jacinto College or to the Superintendent of the K-12 Educational Institution. This agreement will be reviewed periodically. This agreement was created using a Statewide Career Pathways Project articulation agreement template.

INSTITUTION	COURSE NAME & NUMBER
College Name: Mt. San Jacinto College	Intro to Computers and Data Processing CSIS 101
K-12 District Name: Murrieta Valley USD	AP Computer Science Principles

AUTHORIZED K-12 DISTRICT REPRESENTATIVE		
NAME	SIGNATURE	DATE
Faythe Mutchnick-Jayx	*Faythe Mutchnick-Jayx*	3/20/2023
TITLE	EMAIL ADDRESS	
Assistant Superintendent, Educational Services	fmutchnick-jayx@murrieta.k12.ca.us	

MSJC CAREER EDUCATION USE ONLY		
TITLE	SIGNATURE	DATE
Dept. Chair/Program Coordinator	*Glenn Stevenson* Glenn Stevenson (Apr 19, 2023 14:07 PDT)	Apr 19, 2023
Dean, Career Education/Instruction	*Marilyn Harvey*	Apr 24, 2023
Curriculum Committee Chair	John Tribelhorn (Jun 2, 2023 13:34 PDT)	Jun 2, 2023
Vice President	Jeremy Brown (Jun 2, 2023 15:47 PDT)	Jun 2, 2023

Agreement effective date __07__/__01__/__2023__   Agreement end date **06/30/** __2026__

Emailed authorized K-12 District representative __6/8/23__ _____

DATE   MSJC CTE REP INITIALS

PROPOSAL TO ARTICULATE COURSEWORK

Please use one form for each articulation request. The proposal packet should include: (1) this proposal, (2) the secondary school district or ROP official **Course Outline of Record** (COR*), (3) the Credit-by-Exam Criteria Form, and (4) the sample final exam(s) or project(s). Send the complete proposal packet, via e-mail attachment to: **articulation@msjc.edu**

School Year to BEGIN Articulation: | 2023-24

Is this proposal for a NEW agreement or a renewal of an existing agreement?

☐ NEW   ■ **RENEWAL**

This proposal was prepared by:

Murrieta Valley Unified School District	Valerie Backus vbackus@murrieta.k12.ca.us
Name of Secondary District	**Submitted by (Name & Email)**

Please list _all_ faculty within the secondary district who teach the course.

Dana Rice; Cameron Larkins; Ril ⊞	MVHS; VMHS; MMHS	drice@murrieta.k12.ca.us; clarkin ⊞
Faculty Name	**School Site**	**Email Address**

Secondary Course Equivalency *(List all courses that must be completed successfully for articulation)*

7571	AP Computer Science Principles
Course Number	**Course Name/Title**

Post-secondary (MSJC) Course Equivalency *(*List only one MSJC course per form*)*

CSIS-101	Introduction to Computers and Data Processing	3
Course Number	**Course Name/Title**	**Number of Units**

FOR RENEWALS

List dates the current Articulation Agreement was approved / expired:

Approval Date	**Expiration Date**

List _all_ changes or updates to the Secondary Course *(if no changes leave this section blank)*:

Mt. San Jacinto College Course Name & Number	High School / ROP / District Course Name & Number
CSIS-101	7571 APCSP

- **What method(s) of competency will be used for the Credit-by-Exam assessment?***

  ☒ Written Exam ☐ Quizzes ☐ Portfolio ☐ Website

  ☐ Lab ☐ Project ☐ Hands-on Demonstration

  ☐ Other (specify):_____

- **Please describe the Credit-by-Exam procedures:**

  - **Who will administer the credit exam?**

    ☒ High School / ROP Instructor ☐ High School / ROP Counselor

    ☐ MSJC Faculty ☐ MSJC Staff

  - **Where will the credit exam be taken?**

    ☐ Online using Canvas or Eagle Advisor

    ☒ At High School Name:_MVHS; VMHS; MMHS_____

    ☐ At MSJC campus: ☐ San Jacinto ☐ Menifee ☐ Temecula

    ☐ Other Location (specify):_____

PLEASE NOTE: Students who earn seventy percent (70%) "C" on the credit exam will earn articulated credit, indicated by a "P/NP" on their MSJC transcript. In some instances, students may be eligible for a letter grade. If indicated below that this credit-exam is eligible for a letter grade, students who pass the approved credit exam with an 80 or above for these articulated courses will earn the letter grade of "A" or "B". The letter grade will be posted to their transcript.

* If using a Written Exam please attach a copy of the exam and answer key.
If using another method attach a copy of instructions or a description.

Portion below is to be filled out by MSJC department chair or subject-area faculty only:

- **Does the completed credit exam need to be reviewed or graded by the MSJC faculty, or the MSJC department chair, prior to credit being awarded?** ☐ Yes ☒ No

- **Is this credit exam eligible for a letter grade?** ☒ Yes ☐ No

Course Title:	AP Computer Science Principles
Department:	Business/Technology
Course #:	7571
Grade Level/s:	9-12
Length of Course:	Year
Prerequisite/s:	Successful completion of or concurrent enrollment in Math I/Algebra I and Approval of Counselor
UC/CSU (A-G) Req:	D

Brief Course Description: AP Computer Science Principles (AP CSP) introduces students to the foundations of modern computing. The course covers a wide range of foundational topics such as: programming, algorithms, the internet, big data, digital privacy/security and societal impacts. This course is unique in that it focuses on fostering student creativity and applying creative processes when developing computational artifacts. Students design and implement innovative solutions using an iterative process similar to what artists, writers, computer scientists and engineers use to bring ideas to life.

AP CSP is designed to be an entry-level class equivalent to a first-semester introductory college computer science course. Students will use computational tools to analyze and study data while working with large data sets to analyze, visualize and draw conclusions from trends. Students will also develop effective communication and collaboration skills. In addition, students will work individually and in peer groups to discuss and solve problems, write of the importance and impact of technology in their community, society and world.

Student fees are allowable for Advanced Placement examinations for the possibility of college credit, so long as (1) taking the exam is not a course requirement; (2) the exam results have no impact on a pupil's grade or credit in a course; and (3) eligible economically disadvantaged high school pupils who receive school district funding towards the exam fee shall pay the required AP reduced fees.

Course Title: AP Computer Science Principles

I.   **GOALS**

The students will:
A.   Understand the major components of computers and their applications
      CTE Anchor Standards – Academics

B.   Use technology as a tool for problem solving
      CTE Anchor Standards – Technology WS 11-12.6

C.   Understand ethical and societal issues related to computing and computing careers
      CTE Anchor Standards – Problem Solving and Critical Thinking WS 11-12.7

D.   Understand real-world technology problems
      CTE Anchor Standards – Responsibility and Flexibility SLS 9-10, 11-12.1

E.   Develop connections between mathematics and computer science
      CTE Anchor Standards – Problem Solving and Critical Thinking WS 11-12.7

F.   Understand web design, data analysis, programing techniques and technologies
      CTE Anchor Standards – Demonstration and Application

G.   Understand the effects and dynamics of computing developments
      CTE Anchor Standards – Problem Solving and Critical Thinking WS 11-12.7

H.   Demonstrate appropriate use of technology in a variety of situations
      CTE Anchor Standards – Demonstration and Application

I.   Demonstrate the ability to use a variety of job-related computer skills
      CTE Anchor Standards – Demonstration and Application

II. **OUTLINE OF CONTENT FOR MAJOR AREAS OF STUDY**

<u>Semester 1</u>
A.   The Internet
     1. Binary packets
     2. Binary messages
     3. IP addressing and redundancy
     4. Routing, DNS and protocols
     5. Abstraction
     6. The internet and society

Course Title: AP Computer Science Principles

    B.   Digital Information
1. Text compression
2. Encoding images
3. Interpreting visual data
4. Communicating with visualization
5. Cleaning data and making summary tables

    C.   Algorithms and Programming
1. Designing algorithms
2. Procedural abstraction
3. Writing functions
4. Loops and documentation

Semester 2
A.   Big Data and Privacy
1. Big data in the real world
2. The cost of "free"
3. Foundations of encryption
4. Asymmetric and public key encryption

    B.   Building Apps
1. Designing event-driven apps
2. User input and variables
3. Boolean logic and conditionals
4. While loops and arrays
5. Simulations
6. Functions
7. Processing arrays

    C.   Performance Tasks
1. Creation of performance tasks
2. Creation of exploration tasks

III. ACCOUNTABILITY AND DETERMINANTS

    A.   Key Assignments
1. Analysis of Algorithms – This assignment utilizes Khan Javascript programming to compute algorithms. These algorithms include: sequencing, selection, iteration and recursion. Classic computing algorithms will be covered and includes searching and sorting to develop a visual representation of their efficiency in terms of the number of operations. The assignment will also include computing algorithms using techniques like pseudocode. The evaluation of time efficiency of algorithms will be included in this assignment.

Course Title: AP Computer Science Principles

        2.   Data Identification and Collection - This lesson covers data collection on the Internet to complete the Impact of Innovation Project. It focuses on the following Google services: search (general data gathering), web analytics (gathering data about website visitors) and forms (gathering data as surveys of people). Searching includes coverage of first-order logic used by Google in search queries. In addition to the concept of data collection, this assignment provides practical tutorials on searching, search engine optimization, installing and performing analysis with Google Analytics and creating Google forms.

                    The assignment includes: Google searches including meta-search symbols and advanced search. These searches will assist in the completion of the Impact of Innovation Project. This project includes collection and reflection of survey data from the Impact of Innovation Project.

B.   Assessment Methods
1. Skill mastery and quality of work
2. Classwork/homework
3. Performance tasks
4. Projects
5. Presentations
6. Quizzes
7. Response questions
8. Multiple choice tests
9. End of unit exams
10. Semester final exams

IV. INSTRUCTIONAL MATERIALS AND METHODOLOGIES

A.   Required Textbook(s)
None

B.   Supplementary Materials
1. Code.org
2. Mobile CSP

C.   Instructional Methodologies
1. Teacher lectures/direct instruction
2. Class discussions
3. Cooperative learning
4. Guided Inquiry
5. Simulation activities
6. Close reading
7. Collaborative peer review
8. Teacher and student lead inquiry
9. Flowchart development
10. Group project/presentations

Computer Science Principles

EXAM INFORMATION	DESCRIPTION

Exam Number

803

Items

26

Points

30

Prerequisites

25 WPM

Recommended Course Length

ONE YEAR

National Career Cluster

INFORMATION TECHNOLOGY

SCIENCE, TECHNOLOGY, ENGINEERING, & MATHEMATICS

Performance Standards

YES

Certificate Available

YES

Computer Science Principles is a new course that follows a project to develop a computer science course that seeks to broaden participation in computing and computer science. The course places emphasis on the principles of computer science rather than just programming. Big ideas and concepts include: (1) Computing is a creative activity. (2) Abstraction reduces information and detail to facilitate focus on relevant concepts. (3) Data and information facilitate the creation of knowledge. (4) Algorithms are used to develop and express solutions to computational problems. (5) Programming enables problem solving, human expression, and creation of knowledge. (6) The Internet pervades modern computing. (7) Computing has global impacts.

EXAM BLUEPRINT

STANDARD		PERCENTAGE OF EXAM
1.	Creativity and Computing	3%
2.	Abstraction	17%
3.	Data	10%
4.	Algorithms	17%
5.	Programming	33%
6.	Internet	13%
7.	Computation	7%

STANDARD 1

Creativity and computing are prominent forces in innovation; the innovations enabled by computing have had and will continue to have far-reaching impact. At the same time, computing facilitates exploration and the creation of knowledge. This course will emphasize these creative aspects of computing. Students in this course will create interesting and relevant artifacts with the tools and techniques of computer science.

Objective 1   Computing fosters the creation of artifacts.
1. Use computing tools and techniques to create artifacts.
2. Collaborate in the creation of computational artifacts.
3. Analyze computational artifacts.

Objective 2   Computing fosters creative expression.
1. Use computing tools and techniques for creative expression.

Objective 3   Programming is a creative process.
1. Use programming as a creative tool.

STANDARD 2

Abstraction reduce information and detail to facilitate focus on relevant concepts. Everyone uses abstraction on a daily basis to effectively manage complexity. In computer science, abstraction is a central problem-solving technique. It is a process, a strategy, and the result of reducing detail to focus on concepts relevant to understanding and solving problems. This course will include examples of abstractions used in modeling the world, managing complexity, and communicating with people as well as with machines. Students in this course will learn to work with multiple levels of abstraction while engaging with computational problems and systems.

Objective 1   A combination of abstractions built upon binary sequences can be used to represent all digital data.
1. Describe the combination of abstractions used to represent data.
2. Explain how binary sequences are used to represent digital data.

Objective 2   Multiple levels of abstraction are used in computation.
1. Develop an abstraction.
2. Use multiple levels of abstraction in computation.

Objective 3   Models and simulations use abstraction to raise and answer questions.
1. Use models and simulations to raise and answer questions.

STANDARD 3

Data and information facilitate the creation of knowledge. Computing enables and empowers new methods of information processing that have led to monumental change across disciplines, from art to business to science. Managing and interpreting an overwhelming amount of raw data is part of the foundation of our information society and economy. People use computers and computation to translate, process, and visualize raw data, and create information. Computation and computer science facilitate and enable a new understanding of data and information that contributes

knowledge to the world. Students in this course will work with data using a variety of tools and techniques to better understand the many ways in which data is transformed into information and knowledge.

Objective 1   People use computer programs to process information to gain insight and knowledge.
1. Use computers to process information to gain insight and knowledge.
2. Collaborate when processing information to gain insight and knowledge.
3. Communicate insight and knowledge gained from using computer programs to process information.

Objective 2   Computing facilitates exploration and the discovery of connections in information.
1. Use computing to facilitate exploration and the discovery of connections in information.
2. Use large data sets to explore and discover information and knowledge.

Objective 3   Computational manipulation of information requires consideration of representation, storage, security, and transmission.
1. Analyze the considerations involved in the computational manipulation of information.

STANDARD 4

Algorithms are fundamental to even the most basic everyday tasks. Algorithms realized in software have affected the world in profound and lasting ways. The development, use, and analysis of algorithms is one of the most fundamental aspects of computing. Students in this course will work with algorithms in many ways: they will develop and express original algorithms, they will implement algorithms in some language, and they will analyze algorithms both analytically and empirically.

Objective 1   An algorithm is a precise sequence of instructions for a process that can be executed by a computer.
1. Develop an algorithm designed to be implemented to run on a computer.

Objective 2   Algorithms are expressed using languages.
1. Express an algorithm in a language.

Objective 3   Algorithms can solve many but not all problems.
1. Appropriately connect problems and potential algorithmic solutions.

Objective 4   Algorithms are evaluated analytically and empirically.
1. Evaluate algorithms analytically and empirically.

STANDARD 5

Programming enables problem solving. Human expression, and creation of knowledge. Programming and the creation of software have changed our lives. Programming results in the creation of software, and it facilitates the creation of more general computational artifacts including

music, images, visualizations, and more. In this course, programming will enable exploration and the object of study. This course will introduce students to the concepts and techniques used in writing programs and to the ways which programs are developed and used by people; the focus of the course is not on programming per se, but on all aspects of computation. Students in this course will create programs translating human intention into computational artifacts.

Objective 1	Programs are written to execute algorithms.
	1. Explain how programs implement algorithms.
Objective 2	Programming is facilitated by appropriate abstractions.
	1. Use abstraction to manage complexity in programs.
Objective 3	Programs are developed and used by people.
	1. Evaluate a program for correctness.
	2. Develop a correct program.
	3. Collaborate to solve a problem using programming.
Objective 4	Programming uses mathematical and logical concepts.
	1. Employ appropriate mathematical and logical concepts in programming.

STANDARD 6

Internet pervades modern computing. The internet and the systems built on it have had a profound impact on society. Computer networks support communication and collaboration. The principles of systems and networks that helped enable the internet are also critical in the implementation of computational solutions. Students in this course will gain insight into how the internet operates, study characteristics of the internet and systems built upon it and analyze important concerns such as cybersecurity.

Objective 1	The Internet is a network of autonomous systems.
	1. Explain the abstractions in the Internet and how the Internet functions.
Objective 2	Characteristics of the Internet and the systems built on it influence their use.
	1. Explain characteristics of the Internet and the systems built on it.
	2. Analyze how characteristics of the Internet and the systems built on it influence their use.
Objective 3	Cybersecurity is an important concern for the Internet and the systems built on it.
	1. Connect the concern of cybersecurity with the Internet and the systems built on it.

STANDARD 7

Computation has changed the way people think, work, live, and play. Our methods for communicating, collaborating, problem solving, and doing business have changed and are changing due to innovations enabled by computing. Many innovations in other fields are fostered by advances in computing. Computational approaches lead to new understandings, new discoveries, and new disciplines. Students in this course will become familiar with many ways in which computing enables innovation, and they will analyze the potential benefits and harmful effects of computing in a number of contexts.

Objective 1   Computing affects communication, interaction, and cognition.
    1.   Analyze how computing affects communication, interaction, and cognition.
    2.   Collaborate as part of a process that scales.
Objective 2   Computing enables innovation in nearly every field.
    1.   Connect computing with innovations in other fields.
Objective 3   Computing has both beneficial and harmful effects.
    1.   Analyze the beneficial and harmful effects of computing.
Objective 4   Computing is situated within economic, social, and cultural contexts.
    1.   Connect computing within economic, social, and cultural contexts.