



# Palm Springs Unified School District Secondary Course Description

**Please read:** Sections 1 and 2 must be completed and submitted to the Director of Secondary Curriculum and Instruction for all courses seeking PSUSD Cabinet and Board approval. Sections 3 and/or 5 must be completed if the course will be submitted to the University of California (UC) for placement on your school's a-g list and/or Career and technical educational (CTE).

\*\*\*NOTE: If this is a COD "Dual Enrollment" course then the course cannot be changed.

## District Office Use Only

Transcript Title(s)/Abbreviation: MESA 2

Transcript Course Code(s)/Number(s): 8509 Cabinet/BOE Approval Date: 5/28/2019

## Section 1: Course Content

1. Course Title: MESA 2 - Introduction to Computer Science

Date this course was first submitted to the Curriculum Advisory: 5/7/19

2. Is this a re-write of an existing course? No  If "Yes," what is the District Course Code: \_\_\_\_\_

3. CALPADS Code : 6098-Other instruction-related assignment

4. PSUSD graduation requirement subject area: General Elective

5. Unit Value for complete course: 10 PSUSD credits (one year/two semesters)  6. Grade Level: --  10  11  12

Course can be repeated for Credit?

*Note: Grade level pertains to which grades the course has been designed.*

7. PSUSD Department: Non-Departmental

8. PSUSD weighted GPA? No 9. Is this an "online" learning course? No

Dual Enrollment?

If "Yes," list the online provider: \_\_\_\_\_

*Note: If "Yes," an additional course code will be created by ETIS with a virtual designation.*

10. Will this course be offered only through the Alternative Education Program? No

11. Career Pathway Relationship

*Note: Refer to the list of Industries and their associated Pathways in Section 5, Item #38*

Is this course an Industry and Career Pathway-related Course? No

If "Yes," which Industry? (type here or select one) \_\_\_\_\_

Which Pathway? \_\_\_\_\_

What sequence level? (type here or select one) \_\_\_\_\_

12. Is this course an Academy-related Course? No If "Yes," which Academy? \_\_\_\_\_

### 13. Course Content:

For each unit of the course, provide:

1. A brief description (5-10 sentences) of topics to be addressed that demonstrates the critical thinking, depth and progression of content covered.
2. A brief summary (2-4 sentences) of at least one assignment that explains what a student produces, how the student completes the assignment and what the student learns.

In this year-long college-preparatory course, students will explore robotics, computer programming and coding. Working in teams students complete a series of design challenges (hands-on projects) such as: VEX robotics, ARDUINO controlled devices, SCRATCH programs, web page design and JAVA based applications and programs. These projects promote critical thinking, communication, collaboration, creativity and provide a foundation for data collection, analysis, reflection, presentations and technical writing skills. Each unit introduces students to the real world application of the skills and principles and highlights how they relate to possible careers in STEM fields

#### **Unit One - Introduction to Computing**

In this unit students are introduced to the concepts of computing while investigating the major components of computers and the suitability of these components for particular applications. Students will experiment with internet techniques, explore a variety of websites and web applications and will also learn the history of computer science and the world wide web. Students will research current events related to public policy, law, ethics and the societal impact of data and the internet which will include discussing issues of privacy and security. The fundamentals of human interaction and ergonomics are introduced and students will learn that machine behavior is based on algorithms applied to useful representations of information. Students will compare and contrast the characteristics that make certain tasks easy or difficult for computers and for humans. Students will be introduced to coding. Throughout the engineering design cycle students are required to document their findings in an engineering notebook in preparation for panel discussions and peer dialogue about their project. The unit will culminate in the creation of a SCRATCH program demonstrating different input methods and reflecting the knowledge gained in the unit

#### **Unit Two - Math Challenge**

This unit provides students with opportunities to gain greater proficiency in higher level math courses by becoming more computational thinkers by applying a variety of problem-solving techniques as they create solutions to problems that are situated in a variety of contexts. The range of contexts will require students to think abstractly and apply known algorithms where appropriate, but also create new algorithms. The contexts may reveal situations in which problems are not easily solved by computer and for which there are no known solutions. This unit also illustrates the connections between mathematics and computer science. Students will be introduced to selected topics in discrete mathematics including Boolean logic, functions, graphs and the binary number system. Students are also introduced to searching and sorting algorithms and graphs. Students will have the opportunities to become more proficient speakers and communicate effectively as they will need to present and justify their solutions.

#### **Unit Three - Webpage Design Challenge**

This unit expands on student's knowledge of algorithms, data sets and abstraction and will have them become a web page developer. Students will learn to plan and code their web pages using various techniques including but not limited to HTML and XML. They will investigate issues of social responsibility in web use such as data mining and rights to privacy. They will ensure

their web pages are user-friendly, compatible and stable across different platforms. Throughout the project students will utilize the engineering design cycle and document their findings in their engineering design notebooks.

#### **Unit Four - Programming - Biology App Challenge**

Students are introduced to some basic issues associated with program design and development. Students design algorithms and create programming solutions to a variety of computational problems using an interactive development process. Programming problems include mathematical and logical concepts and a variety of programming constructs. Students will explore and experiment with different application development programs to design and program a biology experiment with different application development programs to design and program a biology related app for use on a cell phone or tablet, such as a variation of an activity tracker, a biology study aid, a game about body systems, or a diet tracker. Students will test it on different platforms and have the opportunity to troubleshoot and fix the various bugs afflicting their program

#### **Unit Five - VEX Robotics Challenges**

This unit introduces robotics as an application of computer science that can be used to solve problems in a variety of settings from business to health care and how robotics enables innovation by automating processes that may be dangerous or otherwise problematic for humans. Students explore how to integrate hardware and software in order to solve problems. Students will see the effect of software and hardware design on the resulting product. Students will apply previously learned topics to the study of robotics.

#### **Unit Six - Advanced Robotics/Design**

In this unit students expand on the previous unit to continue learning how the different types of inputs received from various types of sensors, such as sound, light or electrical signals are converted into code that a computer can understand and can then execute certain actions. Students will apply the previously learned topics of programming and algorithms to design a device utilizing Arduino or Raspberry Pi hardware that may benefit society. The challenge may focus on water, environmental or biology related issues affecting society. Students will utilize their engineering journals to document the design process and outcomes. Students will also be required to present their device in front of a panel and be prepared to answer technical questions about their device

#### **Unit Seven - Cybersecurity**

This unit will introduce students to the principles of data and technology that define cybersecurity. They will investigate the importance of cybersecurity and the integral role of cybersecurity professionals. Students will explore the foundations of cybersecurity principles, risk management, security architecture, incidents, attacks and emerging IT technologies. They will be able to distinguish system and applications security threats and vulnerabilities and different classes of attacks. For the final project or challenge, students may be presented with a cybersecurity scenario in which they will have to submit a written document which will define the type of incident, analyze the threat and risk within the context of cybersecurity, evaluate the potential outcomes resulting from the scenario and determine the best solution.

14. Course Overview [Provide a brief summary/snapshot (3-5 sentences) of the course's content]:

In this year-long college-preparatory course, students will explore robotics, computer programming and coding. Working in teams students complete a series of design challenges (hands-on projects) such as: VEX robotics, ARDUINO controlled devices, SCRATCH programs, web page design and JAVA based applications and programs. These projects promote critical thinking, communication, collaboration, creativity and provide a foundation for data collection, analysis, reflection, presentations and technical writing skills. Each unit introduces students to the real world application of the skills and principles and highlights how they relate to possible careers in STEM fields.

15. Texts and Supplemental Instructional Materials (*all non-core instructional materials are the responsibility of individual schools to purchase.*)

Texts: \_\_\_\_\_

Supplemental Materials: \_\_\_\_\_ UC supplemental materials

16. Will this course be submitted for approval by UC? Yes

## Section 2: School and District Information

### School Information

1. School Name: Cathedral City High School

School District: Palm Springs Unified School District

City and State: Palm Springs, California District Web Site: http://www.psusd.us

### School Course List Contact Information (Name of AP of Curriculum or Principal)

2. Name: Julia Bartsch

Position/Title: Assistant Principal Email: jbartsch@psusd.us

Phone #: 760-770-0139 Ext: \_\_\_\_\_

### Teacher Contact Information (Name of teacher/administrator who authored this course)

3. Name: \_\_\_\_\_

Position/Title: \_\_\_\_\_ Email: \_\_\_\_\_

Phone #: \_\_\_\_\_ Ext. \_\_\_\_\_



# Palm Springs Unified School District Secondary Course Description

## Section 3: Course Information

1. Was this course "Previously Approved" by UC? Yes

*Note: if this course is to be submitted to UC and it was "Previously Approved," the exact same course title as the previously approved course must be used. Complete outlines are not needed for courses previously approved by UC. Courses that are defined as "previously approved" are courses from the following programs (Advanced Placement, International Baccalaureate, ROP courses, etc.), or courses from within the same district, or courses that have been removed within a three-year window are being reinstated, and/or courses from UC-approved online providers. Courses modeled after courses from outside the school district are also defined as "previously approved" but a complete course description will be required for submission to UC. Each section below represents an individual page on the UC electronic submission site.*

If "No," proceed to the Course Description Section (Section 4).

If "Yes," indicate which category applies:

2. Is this course modeled after a UC-approved course from another high school outside of our district? Yes

*Note: If "Yes," you will be required to submit a complete course description. UC will review the previous submission, if it is available, to assist them in their review process.*

If "Yes," list which school: CA MESA Program

Exact Course Title: MESA 2 - Introduction to Computer Science

3. Is this course modeled after an identical course approved by UC for the current year at another high school in PSUSD: No

If "Yes," what school? \_\_\_\_\_

Exact Course Title: \_\_\_\_\_

4. Is this course being reinstated after removal within 3 years: No

If "Yes," what year was the course removed from the list? \_\_\_\_\_

Exact Course Title: \_\_\_\_\_

5. Has this course been provided program status, is not an online course, and is it listed below? No

If "Yes," select an option from the Program  
Status list: --

6. If "Advanced Placement," has it been authorized by the College Board through the AP audit process? --

*Note: UC will only allow Advanced Placement courses that have passed or are in the AP audit process. UC requires all AP courses on your list, including those approved in prior years, to be verified via the College Board AP audit process. UC will run quarterly reports based on AP Audit data. AP courses not listed on the AP audit list will be removed.*

If "In Progress," date submitted to AP: \_\_\_\_\_  
MM/DD/YYYY

Exact Program Course Title: --

7(a). Is this course provided by one of the UC-approved online curriculum providers listed in #8?

No

7(b). Have you signed the appropriate partnership agreement with the provider regarding methods of delivery and instruction?

No

*Note:* You must have signed an agreement with the appropriate provider and filed with UC in order to use their courses.

8. If the answer to either 7(a) or (b) is “No,” UC will not approve this course. If “Yes” to both 7(a) and (b)., then select the appropriate option from the Online Provider List below:

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### 9. Seeking “Honors” Distinction

*Note:* To receive “Honors” distinction for both UC and PSUSD, the course content must satisfy certain requirements. For information about these requirements, refer to the a-g Guide: <http://www.ucop.edu/a-gGuide/ag/a-g/honors.html>. For “Previously Approved” courses (including AP and IB), the honors information will be pre-populated as applicable on your UC submission template.

No

*Note:* “Other Honors” is defined by UC as a course specifically designed with distinctive features which set it apart from regular high school courses in the same discipline areas. The course should be seen as comparable in terms of workload and emphasis to AP, IB or introductory college courses in the subject. Honors courses must be designed for the 11<sup>th</sup> and 12<sup>th</sup> grade level to be UC approved and require a comprehensive, year-long written final exam. In addition to AP and IB higher level courses, **high schools may certify not more than one honors level course per grade level in each of the following subject areas only: history, English, advanced mathematics, each laboratory science course, each language other than English, and each of the four VPA disciplines.** If there are no AP or IB or higher level courses in a given subject area, the high school may certify up to, but not more than two honors level courses in that area.

### 10. Subject Area and Category

“a” - History/Social Science

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“b” - English

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“c” - Mathematics

Integrated Math 3

“d” - Laboratory Science

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*Note:* Students electing to enroll in an integrated-science program (ISP) are strongly advised by UC to complete the entire three-year sequence. In most cases, the first year of an integrated science sequence fulfills only the “g” elective requirement: the second and third years of the sequence then fulfill the two-year “d” laboratory science requirement. Accordingly, if only ISP 1 and only one of ISP 2 or ISP 3 are completed, then one additional course from the categories of Biology, Chemistry, or Physics from the “d” subject area must be taken to fulfill the “d” requirement.

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*Note:* This category demonstrates that the course is cross-disciplinary and is often used for advanced science courses such as AP Environmental Science or Biochemistry

“e” - Language Other than English

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Language --

“f” - Visual and Performing Arts

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“g” - Elective

Other





# Palm Springs Unified School District High School Course Description

## Section 4: Course Attributes

1. Is this course classified as a Career Technical Education Course?

No

\_\_\_\_\_

If no, skip item #2

2. If "Yes," select the name of the industry **and** Career Pathway:

- Agriculture and Natural Resources --  
\_\_\_\_\_
- Arts, Media, and Entertainment --  
\_\_\_\_\_
- Building and Construction Trades --  
\_\_\_\_\_
- Business and Finance --  
\_\_\_\_\_
- Education, Child Development and Family Services --  
\_\_\_\_\_
- Energy, Environment, and Utilities --  
\_\_\_\_\_
- Engineering and Architecture --  
\_\_\_\_\_
- Fashion and Interior Design --  
\_\_\_\_\_
- Finance and Business --  
\_\_\_\_\_
- Health Science and Medical Technology --  
\_\_\_\_\_
- Hospitality, Tourism, and Recreation --  
\_\_\_\_\_
- Information and Communication Technologies --  
\_\_\_\_\_
- Manufacturing and Product Development --  
\_\_\_\_\_
- Marketing, Sales, and Service --  
\_\_\_\_\_
- Public Services --  
\_\_\_\_\_
- Transportation --  
\_\_\_\_\_