

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

Course Title	<i>Python Programming</i>	Course Code	JT323 & JT324
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Transcript Title:	PythonProgramming		Grades Levels:	9-12	Board Adoption Date:	4/19/22
Content Area:	Computer Science - CTE		GPA Scale:	4.0	Date Course Submitted:	3/9/22
Credential Required:	CTE	Graduation Subject Areas:		Elective	CALPADS Code:	8100
UC/CSU “A-G” Area Approvals:		Desire D		School Site/person that wrote and submitted the course:		Bulone/Darnall
Recommend Skills:	Communication, Reading, Writing, Ability to follow directions					
Next course(s):	AP Computer Science Principles					
Textbook and/or software to be used:	CodeHS					

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

Course Title	<i>Python Programming</i>	Course Code	<i>[Office use only]</i>
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Python Programming

DATE: March 25, 2022

INDUSTRY SECTOR: Information and Communication Technology

PATHWAY: Multiple Pathways/Software and Systems Development

CALPADS TITLE: Introduction to Information and Communication Technologies

CALPADS CODE: 8100

HOURS:

Total	Classroom	Laboratory/CC/CVE
180	40	140

JOB TITLE	ONET CODES	JOB TITLE	ONET CODES
Computer Operator	43-9011.00	E/M Technicians	17-3024.00
Robotics Technician	17-3024.01		
Computer Programming	15-1131.00		

COURSE DESCRIPTION:

The Python Programming course teaches the fundamentals of computer programming as well as some advanced features of the Python language. Students write and run Python programs using a web-based editor.

Goals:

Students will develop an appreciation for how computers store and manipulate data by building simple console-based games. This course is equivalent to a semester-long introductory Python course at the college level.

PREREQUISITES:

High School Name:	Site Prerequisite:
Corona del Mar High School	Exploring Computer Science is recommended but not required.
Newport Harbor High School	Exploring Computer Science is recommended but not required.

A – G APPROVAL: ☐ Yes ☐ No ☒ Desired

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

ARTICULATION:

High School Name:	College Name:	College Course Title:
Corona del Mar High School	None currently	n/a
Newport Harbor High School	None currently	n/a

LEVEL: Participant Introductory Concentrator Capstone

CERTIFICATION:

High School Name:	Embedded/Leads to:	Description:
Corona del Mar High School	CodeHS Python course curriculum/certification	CodeHS Python certification
Newport Harbor High School	CodeHS Python course curriculum/certification	CodeHS Python certification

METHOD OF STUDENT EVALUATION:

- ✓ Pre and Post test
- ✓ Student Projects
- ✓ Written work
- ✓ Observation record of student performance
- ✓ Completion of assignments

METHOD OF INSTRUCTION:

- ✓ Lecture
- ✓ Group and individual applied projects
- ✓ Demonstration
- ✓ Field Trips
- ✓ Guest Speaker

RECOMMENDED TEXTS AND/OR SOFTWARE:

- CodeHS

MODEL CTE PATHWAY: Corona del Mar High School

Grade:	Fall Semester:	Spring Semester:
8	Exploring Computer Science A	Exploring Computer Science B
9-12	Python Programming A	Python Programming B
10-12	AP Computer Science Principles A	AP Computer Science Principles A
11-12	AP Computer Science Application A	AP Computer Science Application B

MODEL CTE PATHWAY: Newport Harbor High School

Grade:	Fall Semester:	Spring Semester:
9	Exploring Computer Science A	Exploring Computer Science B
10	Python Programming A	Python Programming B
11	AP Computer Science Principles A	AP Computer Science Principles A
12	AP Computer Science Application A	AP Computer Science Application B

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

CALIFORNIA CAREER TECHNICAL EDUCATION MODEL CURRICULUM STANDARDS

California Department of Education CTE Standards website: <http://www.cde.ca.gov/ci/ct/sf/ctemcstandards.asp>

**INDUSTRY SECTOR
KNOWLEDGE AND PERFORMANCE ANCHOR STANDARDS**

1.0 Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the Information and Communication Technologies academic alignment matrix for identification of standards.

2.0 Communications

Acquire and accurately use Information and Communication Technologies sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats. (Direct alignment with LS 9-10, 11-12.6)

2.1 Recognize the elements of communication using a sender–receiver model.

2.2 Identify barriers to accurate and appropriate communication.

2.3 Interpret verbal and nonverbal communications and respond appropriately.

2.4 Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.

2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

2.6 Advocate and practice safe, legal, and responsible use of digital media information and communications technologies.

2.7 Use technical writing and communication skills to work effectively with diverse groups of people.

2.8 Understand the principles of a customer-oriented service approach to users.

3.0 Career Planning and Management

Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. (Direct alignment with SLS 11-12.2)

3.1 Identify personal interests, aptitudes, information, and skills necessary for informed career decision making.

3.2 Evaluate personal character traits such as trust, respect, and responsibility and understand the impact they can have on career success.

3.3 Explore how information and communication technologies are used in career planning and decision making.

3.4 Research the scope of career opportunities available and the requirements for education, training, certification, and licensure.

3.5 Integrate changing employment trends, societal needs, and economic conditions into career planning.

3.6 Recognize the role and function of professional organizations, industry associations, and organized labor in a productive society.

3.7 Recognize the importance of small business in the California and global economies.

4.0 Technology

Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Information and Communication Technologies sector workplace environment. (Direct alignment with WS 11-12.6)

4.1 Use electronic reference materials to gather information and produce products and services.

4.2 Employ technology-based communications responsibly and effectively to explore complex systems and issues.

4.3 Use information and communication technologies to synthesize, summarize, compare, and contrast information from multiple sources.

4.4 Discern the quality and value of information collected using digital technologies and recognize bias and intent of the associated sources.

4.5 Research past, present, and projected technological advances as they impact a particular pathway.

4.6 Assess the value of various information and communication technologies to interact with constituent populations as part of a search of the current literature or in relation to the information task.

5.0 Problem Solving and Critical Thinking

Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Information and Communication Technologies sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques. (Direct alignment with WS 11-12.7)

5.1 Identify and ask significant questions that clarify various points of view to solve problems.

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

- 5.2 Solve predictable and unpredictable work-related problems using various types of reasoning (inductive, deductive) as appropriate.
- 5.3 Use systems thinking to analyze how various components interact with each other to produce outcomes in a complex work environment.
- 5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.
- 5.5 Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.
- 5.6 Know the available resources for identifying and resolving problems.
- 5.7 Work out problems iteratively and recursively.
- 5.8 Create and use algorithms and solve problems.
- 5.9 Deconstruct large problems into components to solve.
- 5.10 Use multiple layers of abstraction.
- 5.11 Understand the concept of base systems, including binary and hexadecimal.
- 5.12 Apply the concepts of Boolean logic to decision making and searching.

6.0 Health and Safety

Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Information and Communication Technologies sector workplace environment. (Direct alignment with RSTS 9-10, 11-12.4)

- 6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
- 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
- 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.
- 6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
- 6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
- 6.6 Maintain a safe and healthful working environment.
- 6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).
- 6.8 Maintain a safe and healthful working environment.
- 6.9 Dispose of e-waste properly, understanding the health, environmental, and legal risks of improper disposal.
- 6.10 Act conscientiously regarding the use of natural resources (e.g., paper, ink, etc.)
- 6.11 Conserve energy while computing (e.g., turn off equipment at night, power-saving settings, etc.)

7.0 Responsibility and Flexibility

Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Information and Communication Technologies sector workplace environment and community settings. (Direct alignment with SLS 9-10, 11-12.1)

- 7.1 Recognize how financial management impacts the economy, workforce, and community.
- 7.2 Explain the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.
- 7.3 Understand the need to adapt to changing and varied roles and responsibilities.
- 7.4 Practice time management and efficiency to fulfill responsibilities.
- 7.5 Apply high-quality techniques to product or presentation design and development.
- 7.6 Demonstrate knowledge and practice of responsible financial management.
- 7.7 Demonstrate the qualities and behaviors that constitute a positive and professional work demeanor, including appropriate attire for the profession.
- 7.8 Explore issues of global significance and document the impact on the Information and Communication Technologies sector.

8.0 Ethics and Legal Responsibilities

Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions, when possible, consistent with applicable laws, regulations, and organizational norms. (Direct alignment with SLS 11-12.1d)

- 8.1 Access, analyze, and implement quality assurance standards of practice.
- 8.2 Identify local, district, state, and federal regulatory agencies, entities, laws, and regulations related to the Information and Communication Technologies industry sector.
- 8.3 Demonstrate ethical and legal practices consistent with Information and Communication Technologies sector workplace standards.

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

- 8.4 Explain the importance of personal integrity, confidentiality, and ethical behavior in the workplace.
- 8.5 Analyze organizational culture and practices within the workplace environment.
- 8.6 Adhere to copyright and intellectual property laws and regulations and use and appropriately cite proprietary information.
- 8.7 Conform to rules and regulations regarding sharing of confidential information, as determined by Information and Communication Technologies sector laws and practices.
- 8.8 Identify legal and ethical issues that have proliferated with increased technology adoption, including hacking, scamming, and breach of privacy.

9.0 Leadership and Teamwork

Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution such as those practiced in the Future Business Leaders of America and SkillsUSA career technical student organization. (Direct alignment with SLS 11-12.1b)

- 9.1 Define leadership and identify the responsibilities, competencies, and behaviors of successful leaders.
- 9.2 Identify the characteristics of successful teams, including leadership, cooperation, collaboration, and effective decision-making skills as applied in groups, teams and career technical student organization activities.
- 9.3 Understand the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace setting.
- 9.4 Explain how professional associations and organizations and associated leadership development and competitive career development activities enhance academic preparation, promote career choices, and contribute to employment opportunities.
- 9.5 Understand that the modern world is an international community and requires an expanded global view.
- 9.6 Respect individual and cultural differences and recognize the importance of diversity in the workplace.
- 9.7 Participate in interactive teamwork to solve real Information and Communication Technologies sector issues and problems.

10.0 Technical Knowledge and Skills

Apply essential technical knowledge and skills common to all pathways in the Information and Communication Technologies sector, following procedures when carrying out experiments or performing technical tasks. (Direct alignment with WS 11-12.6)

- 10.1 Interpret and explain terminology and practices specific to the Information and Communication Technologies sector.
- 10.2 Comply with the rules, regulations, and expectations of all aspects of the Information and Communication Technologies sector.
- 10.3 Construct projects and products specific to the Information Communication Technologies sector requirements and expectations.
- 10.4 Collaborate with industry experts for specific technical knowledge and skills.
- 10.5 Understand the major software and hardware components of a computer and a network and how they relate to each other.
- 10.6 Understand data sizes of various types of information (text, pictures, sound, video, etc.) and data capacity of various forms of media.
- 10.7 Understand the SI (metric) prefixes commonly used in computing including, at least, kilo, mega, giga, and tera.
- 10.8 Understand security concepts including authorization, rights, and encryption.
- 10.9 Use common industry-standard software and their applications including word processing, spreadsheets, databases, and multimedia software.
- 10.10 Manage files in a hierarchical system.
- 10.11 Know multiple ways in which to transfer information and resources (e.g., text, data, sound, video, still images) between software programs and systems.
- 10.12 Know appropriate search procedures for different types of information, sources, and queries.
- 10.13 Evaluate the accuracy, relevance, and comprehensiveness of retrieved information.
- 10.14 Analyze the effectiveness of online information resources to support collaborative tasks, research, publications, communications, and increased productivity.

11.0 Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the Information and Communication Technologies anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

through career technical student organizations such as Future Business Leaders of America and SkillsUSA.

11.1 Utilize work-based/workplace learning experiences to demonstrate and expand upon knowledge and skills gained during classroom instruction and laboratory practices specific to the Information and Communication Technologies sector program of study.

11.2 Demonstrate proficiency in a career technical pathway that leads to certification, licensure, and/or continued learning at the postsecondary level.

11.3 Demonstrate entrepreneurship skills and knowledge of self-employment options and innovative ventures.

11.4 Employ entrepreneurial practices and behaviors appropriate to Information and Communication Technologies sector opportunities.

11.5 Create a portfolio, or similar collection of work, that offers evidence through assessment and evaluation of skills and knowledge competency as contained in the anchor standards, pathway standards, and performance indicators.

CR = Classroom Hours LAB/CC = Laboratory/Shop/Community Classroom Hours

I.	INTRODUCTION TO PROGRAMMING IN PYTHON	CR	LAB/CC	STANDARDS
	Unit 1: 3 weeks Learn the basics of programming by drawing shapes on your screen with Turtle Graphics. Turtle Graphics (or Logo) is a beginner friendly way to explore programming concepts and bring creativity into programming the visual way. Vocabulary: 1. Commands 2. Colors 3. Loops 4. Functions Model Tasks: 17 exercises in total Example exercises: 1. Draw simple shapes with different colors 2. Reduce redundancy in your program using loops and functions Support for students who are struggling with content Content: Supplemental Materials - teacher support, tutorials Process: Before and after-school help Product: CodeHS, codeacademy.com Extension for high achieving students Content: Challenge exercises Process: in-class Product: Code Academy https://code.google.com/codejam/dcoderapp	5	10	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11-12.2, 11-12.3, 11- 12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11-12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 N-VM 12 S-IC 2,3,5,6 CST A Standards: 2-AP-11 3A-AP-13 3A-AP-16 3A-AP-18 3A-AP-23 CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0 CTE Pathway: C1.1 C2.1 C3.1, C3.2 C4.1, C4.6, C4.9

Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study

	Evaluation Formative assessments (ongoing & mid-lesson): individual task evaluation and quizzes Summative assessments (unit final evaluation): take-home projects, lab tests, written multiple choice tests			
II.	BASIC PYTHON AND CONSOLE INTERACTION	CR	LAB/C C	STANDARDS
	Unit 2: 4 weeks Learn the basics of programming by writing programs that you can interact with using your keyboard. Vocabulary: 1. Printing 2. Debugging 3. Variables 4. Types 5. Arithmetic Expressions 6. User input 7. Strings Model Tasks: 12 exercises in total Example exercises: 1. Printing: Print messages to the console 2. Variables a. Create variables of different types, and print them to the console 3. Types a. Investigate the types of different variables b. Convert between types, and print to console 4. Input/output, arithmetic expressions a. Age in one year - ask the user how old they are, and tell them how old they will be in one year and tell them how old they will be in one year b. Rectangle, part 1 - make variables for length and width and compute area and perimeter c. Rectangle, part 2 - ask the user for length and width and compute area and perimeter	5	15	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11- 12.2, 11-12.3, 11- 12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11- 12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6 N-VM 12 CST A Standards: 2-AP-11 2-AP-13 2-AP-17 3A-AP-23 CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway: C1.1 C2.1 C3.1, C3.2 C4.1, C4.4, C4.6, C4.9 C5.4, C5.5

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

	d. Quadratic formula - ask the user for the coefficients of a quadratic equation, and computer solutions. Support for students who are struggling with the content Content: Supplemental Materials - Teacher Support, Tutorials Process: Before and After-school help Product: CodeHS, Codeacademy.com Extension for high achieving students. Content: Challenge Exercises Process: In-class Product: Codeacademy.com, https://code.google.com/codejam/deader app Evaluation Formative Assessments (ongoing & mid-lesson): Individual task evaluation and quizzes Summative Assessments (unit final evaluation): Take-Home Projects, Lab Tests, Written Multiple-Choice Tests			
III.	VARIABLE DATA TYPES, EXPRESSIONS, STATEMENTS, OPERATORS AND FUNCTIONS	CR	LAB/C C	STANDARDS
	Unit 3: 11 weeks Learn the basics of programming by writing programs that you can interact with using your keyboard. Vocabulary: 1. Comments 2. If statements 3. Boolean values 4. Logical operators 5. Comparison operators 6. Truth tables 7. De Morgan's Laws 8. Short-circuit evaluation 9. Floating point numbers and "equality" 10. While loops 11. For loops 12. Nested control structures 13. Functions 14. Exception Model Tasks: 30 exercises in total	5	35	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11- 12.2, 11-12.3, 11-12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11- 12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6 N-VM 12 CST A Standards: 2-AP-11 2-AP-13 2-AP-14 2-AP-17, 2-AP-18, 3A-AP-23 CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway:

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

	Example exercises 1. If statements and boolean values a. Is it raining? -Write a program that uses a boolean variable to determine whether or not it is raining 2. Boolean operators, and expressions a. Boolean variable -take a variable and use it in an if statement b. Old Enough to Vote? - user reports age and program tells c. Transaction -user reports balance and deposit/withdraw, d. Recipe -ask the user for ingredients, amounts per 3. Loops a. Average test score - compute the average of b. Divisibility - ask the user to enter a numerator and denominator, and re-prompt until the denominator is non-zero 4. Functions a. Raining cats and dogs - write functions to print text art of a cat and a dog b. Temperature converter - write functions to convert from Fahrenheit to Celsius and vice versa			C1.1 C2.2, C2.5, C3.1, C3.2 C4.1, C4.4, C4.11 C5.1, C5.2, C5.4, C5. 5, C5. 6, C5. 7, C5.B, C5.9, C5.10, C5.12
IV.	CONTROL FLOW	CR	LAB/ CC	STANDARDS
	Unit 4: 3 weeks Teach your program to make decisions based on the information it receives. Learn how to decompose your program into smaller pieces that work together to solve a problem. Vocabulary: 1. Indexing and slicing 2. Math operators on strings 3. For loops over a string 4. String Methods Model Tasks: 11 exercises in total Example exercises: 1. Indexing a. First character - write a function that takes a	4	10	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11- 12.2, 11-12.3, 11-12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11- 12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6 N-VM 12 CST A Standards: 2-AP-11, 2AP-13, 2-AP18 3A-AP-23

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

	string and returns the first character b. All but the first character - write a function that takes a string and that takes a string and returns everything but the first character 2. Math operators and strings a. Full name - write a function that takes two strings (a first name and a last name) and returns a full name as a single string b. Replace a letter - write a function that takes a string and returns a copy with the character at a particular index replaced with a dash 3. For loops on strings a. Count occurrences - write a function that takes two strings and returns the number of times the second string appears in the first string 4. String Methods a. Enthusiasm - write a function that takes a string and returns string and returns that string in all upper case b. Remove all from string - write a function that takes two strings and returns a string that consists of the first string with all instances of the second string removed			CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway: C1.1 C2.2, C2.5, C3.1, C3.2, C4.1, C4.4, C4.11 C5.1, C5.2, C5.4, C5.5, C5.6, C5.7, C5.8, C5.9, C5.10, C5.12
V.	STRINGS	CR	LAB/ CC	STANDARDS
	Unit 5: 6 weeks Learn more sophisticated strategies for manipulating text in your programs - slicing, formatting, and using regular expressions. Vocabulary: 1. Tuples 2. Lists 3. Dictionaries 4. 2D lists 5. List comprehensions 6. Packing and unpacking 7. Mutable vs. immutable	5	20	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11- 12.2, 11-12.3, 11-12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11- 12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

	8. Equivalence vs. identity Model Tasks: 15 exercises in total Example exercises: 1. Tuples a. Point distance - represent two points as tuples and make a function to compute the distance between them 2. Lists a. Max in List - find the maximum value in a list b. Slopes - ask for ten coordinate pairs, store the pairs as a list of tuples and report the slope between each adjacent pair. 3. Dictionaries a. Phone book - user repeatedly enters name, and program either asks for the person's phone number or reports the phone number already provided 4. 2D lists Project: Checkerboard - write a program that prints the initial setup of a checkerboard, with a 1 where a piece would be and a 0 where a blank square would be.			N-VM 12 CST A Standards: 2-AP-11, 2-AP-12, 2-AP-13, 2-AP-18 3A-AP-14, 3A-AP-23 CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway: C1.0 C2.2 C3.1, C3.2 C4.4, C4.6, C4.9, C4.11 C5.4, C5.5, C5.6
VI.	DATA STRUCTURES	CR	LAB/ CC	STANDARDS
	Unit 6: 3 weeks Build more complex programs that make use of lists, grids, and dictionaries. Vocabulary: 1. Strings 2. Loops 3. Booleans 4. User inputs Tasks: 1. Allow students to combine a variety of topics (strings, loops, booleans, user input, etc.) 2. Introduce students to incremental development 3. Strengthen debugging skills by having students develop a larger project	5	20	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11-12.2, 11-12.3, 11-12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11-12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11-12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6 N-VM 12 CSTA Standards: 2-AP-10, 2-AP-12, 2-AP-13, 2-AP-18 3A-AP-13, 3A-AP-14, 3A-AP-16, 3A-AP-18, 3A-AP-23

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

	Project: Part 1 - Store a secret word in a variable, ask the user for a guess, and report whether or not it is correct Part 2 - Refine fetching guesses to check for invalid guesses and repeatedly ask until guess is valid Part 3 - Allow the user to guess 10 times, and print a combination of dashes and correct guesses before each guess Part 4 - Only penalize the user for incorrect guesses			CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway: C1.0, C2.0, C3.0, C4.4, C4.6, C4.9, C5.4, C5.5, C5.6
VII.	GUESS THE WORD PROJECT	CR	LAB/ CC	STANDARDS
	Unit 7: 6 weeks Use the skills you've learned in the first four modules to build the game Hangman. Vocabulary: 1. Classes 2. Attributes 3. Class variables vs. instance variables 4. Methods 5. Built-in methods 6. Composition, inheritance, and polymorphism Tasks: 12 exercises in total Example exercises: 1. Rectangle class a. capable of computer its area and perimeter 2. Inheritance a. Examine a program that has a Food class, a Vegetable class that inherits from Food, and a Broccoli class that inherits from Vegetable b. Predict what happens when instance and class variables are accessed in different ways	7	20	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11-12.2, 11-12.3, 11-12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11-12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2 A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6 N-VM 12 CSTA Standards: 2-AP-11 2-AP-12 2-AP-13 2-AP-18 3A-AP-14 3A-AP17 3A-AP-23 CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway: C1.0, C2.0, C3.0, C4.0, C5.0, C6.4
VIII.	CLASSES AND OBJECTS	CR	LAB/ CC	STANDARDS
	Unit 8: 3 weeks Learn the principles of object-oriented design. Vocabulary: 1. External file reading 2. Incremental development 3. Debugging 4. Software testing	3	10	Academic: LS 10.1-10.6, 9-10, 11-12.6, 11-12.1, 11- 12.2, 11-12.3, 11- 12.6 WS 11-12.1, 11-12.2, 11-12.4, 11-12.5, 11- 12.6, 11-12.7 SLS 9-10, 11-12.1, 11-12.1d, 11-12.1b RSIT 10.1-10.6, 11- 12.3, 11-12.7 F-IF 1,2,3,4,6 A-REI 1, 2

**Newport-Mesa Unified School District
Office of Career Technical Education
High School Course of Study**

	Tasks: 1. File reading 2. Allow students to combine a variety of topics in a single program 3. Re-emphasize incremental development 4. Strengthen debugging skills by having students develop a larger project. 5. Program testing Project: Part 1 - Make a dictionary of word counts for a shortened version of Pride and Prejudice and Hamlet. Part 2 - Test your code from Part 1 on the full texts of Pride and Prejudice and Hamlet. Part 3 - Use your dictionary of word counts to predict whether a small text sample was written by Jane Austen or William Shakespeare. Test this prediction program on shortened versions of the texts. Part 4 - Test your code from Part 3 on the full texts.			A-CED 1-4 N-RN 1,2,3 N-Q 1,2,3 S-IC 2,3,5,6 N-VM 12 CSTA Standards: 2-AP-11 2-AP-12 2-AP-13 2-AP-18 3A-AP-14 3A-AP17 3A-AP-23 CTE Anchor: 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0 CTE Pathway: C1.0, C2.0, C3.0, C4.0, C5.0
IX.	EMPLOYMENT PORTFOLIO	CR	LAB/ CC	STANDARDS
	Students will prepare a professional portfolio. • Portfolio showcases best professional level work • Portfolio is organized • Job application • Resume • References Students will research careers in the field.	2	10	Academic: LS 9-10, 11-12.1, 11- 12.2, 11-12.3, 11-12.6 RSIT 11-12.1, 11-12.6, 11-12.7 RSTS 9-10, 11-12.4 RLST 11-12.7 WS 11-12.2, 11-12.6, 11- 12.7 WHSST 11-12.7 SLS 9-10, 11-12.2 CTE Anchor: 1.0, 2.0, 3.0, 4.0, 7.0, 10.0, 11.0 CTE Pathway: C6.0 C7.0, 7.5 C8.0