

COURSE OUTLINE

I. ORIENTATION

- A. Introduce course and facilities
- B. Discuss syllabus and major objectives
- C. Explain attendance, grading, classroom procedures, code of conduct
- D. Complete course safety requirements/test

II. CAREERS IN COMPUTER SCIENCE

- A. Research and understand various occupations within the Computer Science industry sector
- B. Describe the importance of ethical behavior, safety, diversity, and excellent customer service in the Computer Science industry
- C. Explain the impact of pre-employment activities on employability (e.g., financial irresponsibility, criminal record, improper social media behavior, etc.)
- D. Discuss environmentally-sound practices and sustainability within the industry sector

III. PREPARING FOR COLLEGE AND CAREERS

- A. Review and Discuss California CTE Model Curriculum Standards for Career Ready Practice
- B. Create an Education Plan and a Career Plan aligned with personal goals
- C. Create a Resumé
- D. Create a Career Portfolio
- E. Complete a handwritten/hand-printed Job Application neatly, legibly and with no corrections or mistakes
- F. Practice a professional job interview
- G. Evening of Excellence Essay

IV. BEGINNING IN COMPUTER SCIENCE

- E. Understand big ideas like what computer science is and how computers work.
- F. Learn a few basic Python functions, including print () and input (), and use them to create ASCII art.
- G. Research datatypes and variables, building a foundation for the rest of the course.

V. NUMBER CALCULATIONS AND DATA

- A. Discuss more general concepts like arithmetic functions, modular division, and random numbers.
- B. Learn Python-specific concepts like representing colors and modules like math and random, building on the knowledge of the basic functions they gained in the first unit.
- C. Introduce higher-level concepts like the graphical user interface and working with data.
- D. Create a more complex program that will perform multiple actions.

VI. MAKING DECISIONS

- A. Explain the functions of the students' tool kit.
- B. Understand conditionals.
- C. Add Booleans to a list of datatypes learned and apply knowledge of variables to the new statement.
- D. Learn about algorithms and use what they've learned about conditional to write their own.

VII. REPETITION AND LOOPS

- A. Introduce loops-focusing specifically on the while loop-and counting.
- B. Study games, including learning their value for solving real work problems and writing a game.
- C. Learn about real-world problem of cyber security and safety and privacy on the internet.

VIII. GRAPHICS

- A. Create shapes and colors using Python's simplegui module.
- B. Create emoticons, pictures, and animations.
- C. Apply what was learned in previous modules.

IX. FOR LOOPS

- A. Create a for loop and introduce the range function and how to count by other numbers than one using calculation with a for loop.
- B. Review algorithms and learn about tracing code with a for loop.

X. TEXT AND STRING PROCESSING

- A. Understand the concepts of reading, utilizing, and creating external files, functions that can be used with strings, and review ASCII and string manipulation functions.
- B. Demonstrate writing programs that can read, process, and write text files.

COURSE OUTLINE

XI. FUNCTIONS

- A. Practice creating a functions, defining and using parameters in a functions, getting information returned from the function, and use several functions in a program.
- B. Apply tracing code to programs with functions.

XII. ARRAYS

- A. Teach about arrays and how to declare and use them in loops and functions.
- B. Explain the elements, index, and how to use parameters and data in arrays.
- C. Create and utilize an array in a variety of ways including sorting and searching.

XIII. 2D ARRAYS

- A. Present the concept of 2D arrays and how to use them with loops, algorithms, and tracing code.
- B. Apply what was learned to some algorithms for 2D arrays and it image manipulation.

XIV. INTERNET

- A. Explain how the internet works using the concepts of IP Addresses, DNS, packets, routers, cybersecurity, and net neutrality.
- B. Create a web page through the use of HTML and CSS.
- C. Create a basic web site and discuss the different processes of the internet.

ESSENTIAL STANDARDS AND KEY ASSIGNMENTS INDUSTRY SECTOR: Information and Communication Technology

ESSENTIAL PATHWAY STANDARD - A1.0

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARD - A2.0

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARD – A3.0

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARD – A4.0

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARDS – A5.0

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARDS – A6.0

KEY ASSIGNMENT

CTE MODEL CURRICULUM STANDARDS FOR CAREER READY PRACTICE

- 1. Apply appropriate technical skills and academic knowledge.** Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and performing other work-related practices.
- 2. Communicate clearly, effectively, and with reason.** Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others: they are active listeners who speak clearly and with purpose, and they are comfortable with terminology that is common to workplace environments. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.
- 3. Develop an education and career plan aligned with personal goals.** Career-ready individuals take personal ownership of their educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and they understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.
- 4. Apply technology to enhance productivity.** Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring and using new technology. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.
- 5. Utilize critical thinking to make sense of problems and persevere in solving them.** Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve a problem and, once agreed upon, follow through to ensure the problem is resolved.
- 6. Practice personal health and understand financial literacy.** Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.
- 7. Act as a responsible citizen in the workplace and the community.** Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.
- 8. Model integrity, ethical leadership, and effective management.** Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.
- 9. Work productively in teams while integrating cultural and global competence.** Career-ready individuals contribute positively to every team, as both team leaders and team members. To avoid barriers to productive and positive interaction, they apply an awareness of cultural differences. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.
- 10. Demonstrate creativity and innovation.** Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.
- 11. Employ valid and reliable research strategies.** Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.
- 12. Understand the environmental, social, and economic impacts of decisions.** Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.

1: Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards. Note: alignment listed within each sector Anchor Standard

2: Communications Language Standard

Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. LS 9-10, 11-12.6 Anchor Standard

3: Career Planning and Management Speaking and Listening Standard

Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SLS 11-12.2 Anchor Standard

4: Technology Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information. WS 11-12.6 Anchor Standard

5: Problem Solving and Critical Thinking Writing Standard

Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. WS 11-12.7 Anchor Standard

6: Health and Safety Reading Standards for Science and Technical Subjects

Determine the meaning of symbols, key words, and other domain-specific words and phrases as they are used in a specific scientific or technical context. RSTS 9-10 11-12.4 Anchor Standard

7: Responsibility and Flexibility Speaking and Listening Standard

Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively. SLS 9-10 11-12.1 Anchor Standard

8: Ethics and Legal Responsibilities Speaking and Listening Standard

Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work. SLS 11-12.1d Anchor Standard

9: Leadership and Teamwork Speaking and Listening Standard

Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed. SLS 11-12.1b Anchor Standard

10: Technical Knowledge and Skills Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WS 11-12.6 Anchor Standard

11: Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and the career technical student organization.