

Course Outline

Energy, Environment, and Utilities

REVISED: August/2017

72-85-90

Technology Integration/3: Security, HVAC and other Systems

Credits: 15

Hours: 180

Course Description:

This competency-based course is the third in a sequence of three designed for home technology integration (HTI). It provides students with project-based experiences in security, heating, ventilations, and air conditioning (HVAC) and other integrated home systems. Technical instruction includes an introduction, a review of resource management, and an introduction to entrepreneurship. Emphasis is placed on home security and access control systems, HVAC management systems, home irrigation and pool management systems, lighting and lighting control systems, and miscellaneous devices. The competencies in this course are aligned with the California High School Academic Content Standards and the California Career Technical Education Model Curriculum Standards.

Prerequisites:

Enrollment requires successful completion of the Technology Integration/2: Automation, Voice, and Entertainment (72-85-85) course.

NOTE: For Perkins purposes this course has been designated as an **capstone** course.

Sections designated by an asterisk (*) contain competencies that meet the CEA_CompTIA DHTI+ requirements. The said competencies are designed to prepare students to configure, integrate, maintain, troubleshoot, and comprehend the basic design concepts of electronic and digital home systems.

This course cannot be repeated once a student receives a Certificate of Completion.

Job Title

Home Technology Integrator

Career Pathway:

Telecommunications

Industry Sector:

Energy, Environment, and Utilities

O*NET-SOC CODE:

49-2098.00

CBEDS Title:

Telecommunications

CBEDS No.:

4618



COURSE OUTLINE COMPETENCY-BASED COMPONENTS

A course outline reflects the essential intent and content of the course described. Acceptable course outlines have six components. (Education Code Section 52506). Course outlines for all apportionment classes, including those in jails, state hospitals, and convalescent hospitals, contain the six required elements:

(EC 52504; 5CCR 10508 [b]; Adult Education Handbook for California [1977], Section 100)

COURSE OUTLINE COMPONENTS

LOCATION

GOALS AND PURPOSES

Cover

The educational goals or purposes of every course are clearly stated and the class periods are devoted to instruction. The course should be broad enough in scope and should have sufficient educational worth to justify the expenditure of public funds.

The goals and purpose of a course are stated in the COURSE DESCRIPTION. Course descriptions state the major emphasis and content of a course, and are written to be understandable by a prospective student.

PERFORMANCE OBJECTIVES OR COMPETENCIES

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Objectives should be delineated and described in terms of measurable results for the student and include the possible ways in which the objectives contribute to the student's acquisition of skills and competencies.

Performance Objectives are sequentially listed in the COMPETENCY-BASED COMPONENTS section of the course outline. Competency Areas are units of instruction based on related competencies. Competency Statements are competency area goals that together define the framework and purpose of a course. Competencies fall on a continuum between goals and performance objectives and denote the outcome of instruction.

Competency-based instruction tells a student before instruction what skills or knowledge they will demonstrate after instruction. Competency-based education provides instruction which enables each student to attain individual goals as measured against pre-stated standards.

Competency-based instruction provides immediate and continual repetition and In competency-based education the curriculum, instruction, and assessment share common characteristics based on clearly stated competencies. Curriculum, instruction and assessment in competency-based education are: explicit, known, agreed upon, integrated, performance oriented, and adaptive.

COURSE OUTLINE COMPETENCY-BASED COMPONENTS
(continued)

COURSE OUTLINE COMPONENTS

LOCATION

INSTRUCTIONAL STRATEGIES

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Instructional techniques or methods could include laboratory techniques, lecture method, small-group discussion, grouping plans, and other strategies used in the classroom.

Instructional strategies for this course are listed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructional strategies and activities for a course should be selected so that the overall teaching approach takes into account the instructional standards of a particular program, i.e., English as a Second Language, Programs for Adults with Disabilities.

UNITS OF STUDY, WITH APPROXIMATE HOURS ALLOTTED FOR EACH UNIT

Cover

The approximate time devoted to each instructional unit within the course, as well as the total hours for the course, is indicated. The time in class is consistent with the needs of the student, and the length of the class should be that it ensures the student will learn at an optimum level.

pp. 7-14

Units of study, with approximate hours allotted for each unit are listed in the COMPETENCY AREA STATEMENT(S) of the course outline. The total hours of the course, including work-based learning hours (community classroom and cooperative vocational education) is listed on the cover of every CBE course outline. Each Competency Area listed within a CBE outline is assigned hours of instruction per unit.

EVALUATION PROCEDURES

p. 16

The evaluation describes measurable evaluation criteria clearly within the reach of the student. The evaluation indicates anticipated improvement in performances as well as anticipated skills and competencies to be achieved.

Evaluation procedures are detailed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructors monitor students' progress on a continuing basis, assessing students on attainment of objectives identified in the course outline through a variety of formal and informal tests (applied performance procedures, observations, and simulations), paper and pencil exams, and standardized tests.

REPETITION POLICY THAT PREVENTS PERPETUATION OF STUDENT ENROLLMENT

Cover

After a student has completed all the objectives of the course, he or she should not be allowed to reenroll in the course. There is, therefore, a need for a statement about the conditions for possible repetition of a course to prevent perpetuation of students in a particular program for an indefinite period of time.

ACKNOWLEDGMENTS

Thanks to PAUL PIDOUX and MARCELA BAKER for developing and editing this curriculum. Acknowledgment is also given to ERICA ROSARIO for designing the original artwork for the course covers.

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CALIFORNIA CAREER TECHNICAL EDUCATION MODEL CURRICULUM STANDARDS

Energy, Environment, and Utilities 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 Energy, Environment, and Utilities academic alignment matrix for identification of standards.

2.0 Communications

Acquire, and accurately use Energy, Environment, and Utilities sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

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.

4.0 Technology

Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Energy, Environment, and Utilities sector workplace environment.

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 Energy, Environment, and Utilities sector using critical and creative thinking; logical reasoning, analysis, inquiry, and problem-solving techniques.

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 Energy, Environment, and Utilities sector workplace environment.

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 Energy, Environment, and Utilities sector workplace environment and community settings.

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.

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 as practiced in the SkillsUSA career technical student organization.

10.0 Technical Knowledge and Skills

Apply essential technical knowledge and skills common to all pathways in the Energy, Environment, and Utilities sector.

11.0 Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the Energy, Environment, and Utilities anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the SkillsUSA career technical student organization.

Energy, Environment, and Utilities Sector Pathway Standards

C. Telecommunications Pathway

The Telecommunications pathway prepares students for employment and postsecondary education and training in the wireless and fixed-line communications industries. The sharing of information is essential for personal, commercial, educational, government, and military functions. Information is stored, sent, and accessed primarily via the telecommunications industries.

Sample occupations associated with this pathway:

- ◆ Cable/Telecommunications Installation and Maintenance Technicians
- ◆ Line Workers
- ◆ Network Operators, Technicians, Designers, and Managers
- ◆ Network Security Administrator
- ◆ Satellite Systems Installation/Engineers

- C1.0 Understand the basic principles and concepts that impact the telecommunications industry, including systems, concepts, and regulations.
- C2.0 Demonstrate understanding and use of the basic and emerging technologies that impact the telecommunications industry.
- C3.0 Examine the role and functions of satellites in telecommunications.
- C4.0 Research the components, interaction, and operations of wireless telecommunications systems.
- C5.0 Research the components, interaction, and operations of fixed-wire telecommunications systems.
- C6.0 Consider privacy and security issues of the telecommunications systems.

CBE
Competency-Based Education

COMPETENCY-BASED COMPONENTS
for the TI/3: Security, HVAC, and Other Systems Course

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>A. INTRODUCTION AND SAFETY</p> <p>Review, apply, and evaluate classroom and workplace policies and safety procedures according to federal, state, and local safety and environmental regulations.</p> <p>(4 hours)</p>	<ol style="list-style-type: none"> 1. Review the scope and purpose of the course. 2. Describe the overall course content as a part of the Linked Learning Initiative. 3. Review classroom policies and procedures. 4. Review the different occupations in the Energy and Utilities Industry Sector which have an impact on the role of Technology Integration (TI) installers. 5. Review the opportunities available for promoting gender equity and the representation of non-traditional populations in the TI field. 6. Review the purpose of the California Occupational Safety and Health Administration (Cal/OSHA) and its laws governing TI technicians. 7. Review the impact of Environmental Protection Agency (EPA) legislation on the Energy and Utilities Industry Sector practices. 8. Review and demonstrate the procedures for contacting proper authorities for the removal of hazardous materials based on the EPA standards. 9. Review the National Electrical Code (NEC) and its role in safeguarding the work conditions of TI installers. 10. Review and demonstrate the use of the Material Safety Data Sheet (MSDS) as it applies to the TI field. 11. Review the role of the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ in increasing the use of clean and renewable technology in California. 12. Review the City of Los Angeles Building and Safety Codes and their applications to the TI field. 13. Review the provisions of the California Title 24 Energy Efficiency Standards (a.k.a. 2008 California Green Building Standards Code) as they relate to the Energy and Utilities Industry Sector. 14. Review classroom and workplace first aid and emergency procedures based on the American Red Cross (ARC) standards. 15. Pass the safety test with 100% accuracy. 	<p>Career Ready Practice: 1, 3, 6, 8, 12</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4 Career Planning and Management: 3.4, 3.5 Health and Safety 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16 Ethics and Legal Responsibility: 8.2 Technical Knowledge and Skills: 10.1, 10.2</p> <p>CTE Pathway: C1.1, C1.2</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>B. RESOURCE MANAGEMENT REVIEW</p> <p>Review, apply, and evaluate the resource management principles and techniques in the TI field.</p> <p>(1 hour)</p>	<ol style="list-style-type: none"> 1. Review the definitions of the following: <ol style="list-style-type: none"> a. resources b. management c. sustainability 2. Review the management of the following resources in in the TI field: <ol style="list-style-type: none"> a. time b. materials c. personnel 3. List specific examples of effective management of the following resources in in the TI field: <ol style="list-style-type: none"> a. time b. materials c. personnel 4. Review the benefits of effective resource management in in the TI field: <ol style="list-style-type: none"> a. profitability b. sustainability c. company growth 5. Review the economic benefits and liabilities of managing resources in an environmentally responsible way. 	<p>Career Ready Practice: 1, 3, 6, 8, 9, 12</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2 Technology: 4.1, 4.2, 4.3 Problem Solving and Critical Thinking: 5.1, 5.2, 5.4, Health and Safety: 6.11 Responsibility and Flexibility: 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8 Ethics and Legal Responsibility: 8.1, 8.2, 8.4, 8.5 Leadership and Teamwork: 9.1, 9.2, 9.3, 9.6 Technical Knowledge and Skills: 10.1, 10.2</p> <p>CTE Pathway: C1.1, C7.2, C7.3</p>
<p>C. HOME SECURITY AND ACCESS CONTROL SYSTEMS*</p> <p>Understand, apply and evaluate the rigorous design and installation standards for home security systems.</p>	<ol style="list-style-type: none"> 1. Define the following: <ol style="list-style-type: none"> a. home security b. access control c. remote access d. remote control e. zoning f. bypass mode g. relay h. solenoid i. electromagnet lock j. cipher lock k. condition monitoring 	<p>Career Ready Practice: 1, 3, 4, 5</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3, 2.4, Technology: 4.1, 4.2, 4.4 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
	<ol style="list-style-type: none"> l. closed circuit television (CCTV) m. modulator n. quad switcher o. infrared sensor p. lux rating <ol style="list-style-type: none"> 2. Describe the purpose of a home security and fire alarm system. 3. Describe state and local regulations regarding the installation of home security and access control systems. 4. Explain the functional difference between remote access and remote control. 5. Describe the advantages for establishing a zoned security system. 6. Describe the purpose of bypass mode with a zoned security system. 7. Describe the comparative advantages and disadvantages of wired and wireless home security systems. 8. Describe the operational functions that can be performed from the security system keypad. 9. Describe the types of sensors and where they are used in a home security system 10. Describe how a security system phone dialer works with the RJ-31X jack. 11. Explain the operational features of electromagnetic and cipher locks. 12. Describe how a telephone is used for remote access to a gated community. 13. Describe condition monitoring as applied to a home remote access system. 14. Describe the features of a home closed circuit television (CCTV) camera that are the primary cost drivers. 15. Explain the technical features and use of a modulator. 16. Describe the purpose of a quad switcher. 17. Identify the features of a garage door infrared sensor. 18. List the installation steps for a garage door infrared sensor. 19. Explain the reason for the types of wire that are permitted for home security system connectivity. 20. List the major home security system installation specifications and requirements contained in American National Standards Institute/Telecommunications Industry Association/Electronic Industries Alliance (ANSI/TIA/EIA) 570A addendum. 21. Describe the meaning and relevance of lux rating for CCTV cameras. 22. Design a home security system layout. 23. Describe and demonstrate installing, configuring and troubleshooting the connection of access control devices to the access control panel. 	<p>Health and Safety: 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16</p> <p>Ethics and Legal Responsibility: 8.1, 8.2, 8.3, 8.4</p> <p>Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5</p> <p>CTE Pathway: C1.1, C1.2, C2.3, C2.4, C2.5, C2.9, C4.1, C4.2, C4.3, C5.2, C5.3, C5.4, C5.5, C5.6, C5.7, C5.9, C6.1, C6.2, C6.4, C7.2, C7.3, C7.5</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(50 hours)	24. Describe and demonstrate installing, configuring and troubleshooting a home security system with the following features: <ol style="list-style-type: none"> a. connectivity between the components b. control panel c. connectivity with the telephone system d. access and control settings 25. Describe and demonstrate preventative maintenance techniques.	
D. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) MANAGEMENT SYSTEMS* Understand, apply and evaluate the various heating, ventilation, and air conditioning (HVAC) design concepts, components, and control systems.	<ol style="list-style-type: none"> 1. Define the following: <ol style="list-style-type: none"> a. heating, ventilation, and air conditioning (HVAC) b. zoned designs c. non-zoned designs d. centralized system e. distributed system f. air handler g. damper h. furnace i. gas-fired furnace j. oil-fired furnace k. air conditioner l. time-of-day programming m. heat pump n. whole-house fan o. duct fan p. thermostat q. staged thermostat r. Energy Efficient Ratio (EER) s. British Thermal Unit (BTU) t. solar panels u. duct leakage 2. Describe state and local regulations regarding the installation of HVAC control systems. 3. Describe industry standards that govern HVAC control systems 4. Describe the features of zoned and non-zoned HVAC designs. 5. List the features of centralized and distributed systems. 6. Describe the purpose of an air handler in an HVAC system. 7. Explain why motorized dampers are used in a zoned HVAC system. 8. Describe the types of fuels used in furnaces. 9. Identify the main components of a gas-fired furnace. 10. Describe the theory of operation of an air conditioner. 11. Describe the purposes of HVAC system programming and time-of-day programming. 12. Describe the operational features of a heat pump. 13. Describe the operational features of a whole-house fan. 14. Describe the purpose of a duct fan. 15. Identify the preferred locations for installing a thermostat. 16. Explain the operational features of a staged thermostat. 17. Describe an air conditioner EER. 18. Explain how solar panels are used to reduce energy cost. 	Career Ready Practice: 1, 3 CTE Anchor: Communications: 2.1, 2.2, 2.3 Problem Solving and Critical Thinking: 5.1, 5.3, 5.4 Health and Safety: 6.6, 6.8, 6.12, 6.16 Ethics and Legal Responsibilities: 8.2 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5 CTE Pathway: C1.1, C2.4, C5.4, C5.5

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(50 hours)	19. Identify problems associated with duct leakage. 20. Describe the relationship between the components of an oil-fired furnace. 21. Describe how HVAC systems can be controlled from a remote location. 22. Design an HVAC control system layout. 23. Describe and demonstrate installing, configuring and troubleshooting an HVAC zone control system. 24. Describe and demonstrate seasonal preventative maintenance tasks.	
E. HOME IRRIGATION AND POOL MANAGEMENT SYSTEMS* Understand, apply, and evaluate the automated water system management tools and components.	1. Define: <ol style="list-style-type: none"> a. irrigation system b. zoned watering system c. constant-pressure lines d. non-pressurized lines e. trenching f. solenoid control valve g. backflow prevention valve h. automatic timers i. irrigation system controllers j. seasonal presets k. sprinkler head l. rotary impact sprinkler m. gear-driven sprinkler n. fixed spray type sprinkler o. booster pump p. pH q. sump pump r. water alarm 2. Describe state and local regulations regarding the installation and implementation of home irrigation and pool management control systems. 3. Describe industry standards that govern home irrigation and pool management control systems. 4. Describe the planning steps required for installing an irrigation system. 5. Explain the concept and purpose for zoned watering system. 6. Explain the difference between constant-pressure and non-pressurized lines. 7. List the steps required to obtain a construction permit prior to trenching for an irrigation system. 8. Explain the operation of a solenoid control valve. 9. Describe the process of selecting control valve locations. 10. Explain the purpose and operation of a backflow prevention valve. 11. Describe the features of automatic timers and irrigation system controllers.	Career Ready Practice: 1, 3 CTE Anchor: Communication: 2.1, 2.2, 2.3 Problem Solving and Critical Thinking: 5.1, 5.3, 5.4 Health and Safety: 6.6, 6.8, 6.12, 6.16, Ethics and Legal Responsibilities: 8.2 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5 CTE Pathway: C1.1, C5.8, C5.11

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(30 hours)	<ol style="list-style-type: none"> 12. List the features and settings recommended for time-of-day programming. 13. Describe the purpose of seasonal presets. 14. Describe the steps required for installing underground PVC irrigation pipes. 15. Describe the operation of a sprinkler head. 16. Identify the differences between rotary impact and gear-driven sprinklers. 17. List the locations appropriate for fixed spray type sprinklers. 18. Describe the type of PVC pipe used for pressure lines. 19. Describe the features of a booster pump. 20. Describe and demonstrate how irrigation control valve wires are installed in the ground. 21. Describe the proper balance for spa and pool water pH. 22. Describe the location and purpose of a sump pump and sensors. 23. Explain the purpose of a water alarm for a residence. 24. Describe the planning steps required for installing an irrigation system. 25. Describe and demonstrate installing, configuring and troubleshooting home irrigation and pool management systems. 26. Describe and demonstrate preventative maintenance techniques. 	
<p>F. LIGHTING AND LIGHTING CONTROL SYSTEMS*</p> <p>Understand and apply the basic concepts and design considerations in installing and maintaining lighting and lighting control systems.</p> <p>(30 hours)</p>	<ol style="list-style-type: none"> 1. Define the following: <ol style="list-style-type: none"> a. light b. illumination c. lumen d. foot-candle e. efficacy f. ambient lighting g. task lighting h. accent lighting i. load j. watts 2. Describe state and local regulations regarding the installation and implementation of wiring, lighting and lighting control systems. 3. Describe industry standards that govern wiring, lighting and lighting control systems. 4. Identify devices and components used in a home lighting control system. 5. Describe the operation of a home lighting control system. 6. Calculate load and wattage for lighting circuits. 7. Describe and demonstrate installing, configuring and troubleshooting lighting and lighting control systems. 8. Describe and demonstrate preventative maintenance techniques. 	<p>Career Ready Practice: 1, 3, 5</p> <p>CTE Anchor: Communications: 2.1, 2.2, 2.3 Problem Solving and Critical Thinking: 5.1, 5.3, 5.4 Health and Safety: 6.6, 6.8, 6.12, 6.16 Ethics and Legal Responsibility: 8.2 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5</p> <p>CTE Pathway: C1.1, C5.8, C5.11</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>G. MISCELLANEOUS DEVICES*</p> <p>Understand and apply the basic concepts and design considerations in installing and maintaining miscellaneous devices.</p> <p>(10 hours)</p>	<ol style="list-style-type: none"> 1. Define the following: <ol style="list-style-type: none"> a. elevator b. vacuum elevator c. shaft elevator d. dumbwaiter e. stairlift system f. tram system g. wheelchair lift h. docking i. landing j. call and send controls k. fireplace l. fire pit m. fireplace ignition system n. modulating remote system o. skylight p. window treatment 2. Describe state and local regulations regarding the installation and implementation of lift systems. 3. Describe industry standards that govern lift systems. 4. Describe the automation control protocol for the following types of lift systems: <ol style="list-style-type: none"> a. elevator b. stairlift c. tram 5. Describe and demonstrate installing, configuring and troubleshooting lift system automation controls. 6. Describe and demonstrate preventative maintenance techniques. 7. Describe state and local regulations regarding the installation and implementation of fireplace ignition systems. 8. Describe industry standards that govern fireplace ignition systems. 9. Describe the difference between a fireplace and a fire pit. 10. Describe the automation control protocol for fireplace ignition systems. 11. Describe and demonstrate installing, configuring and troubleshooting automation controls for fireplace ignition systems. 12. Describe and demonstrate preventative maintenance techniques. 13. Describe state and local regulations regarding the installation and implementation of skylight, window and window treatment automated control systems. 14. Describe industry standards that govern skylight, window and window treatment automated control systems. 15. Describe automation control protocol for skylight, window and window treatment systems. 16. Describe and demonstrate installing, configuring and troubleshooting automation controls for skylight, window and window treatment systems. 17. Describe and demonstrate preventative maintenance techniques. 	<p>Career Ready Practice: 1, 3, 4, 5, 10</p> <p>CTE Anchor: Communication: 2.1, 2.2, 2.3 Problem Solving and Critical Thinking: 5.1, 5.3, 5.4 Health and Safety: 6.6, 6.8, 6.9, 6.11, 6.12, 6.16 Ethics and Legal Responsibility: 8.2 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5</p> <p>CTE Pathway: C2.4, C5.2, C5.4, C5.6</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>H. ENTREPRENEURIAL SKILLS</p> <p>Review, apply, and evaluate the employability skills required in the TI field.</p> <p>(5 hours)</p>	<ol style="list-style-type: none"> 1. Define entrepreneurship. 2. Identify the necessary characteristics of successful entrepreneurs. 3. Describe the contributions of entrepreneurs to the TI field. 4. Explain the purpose and components of a business plan. 5. Examine personal goals prior to starting a business. 6. Evaluate sources of monetary investment in a business opportunity. 7. Describe various licensing requirements in the TI field. 8. Develop a scenario depicting the student as the TI business owner. 9. Differentiate between LEED business practices and standard business practices. 	<p>Career Ready Practice: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</p> <p>CTE Anchor: Communication: 2.1, 2.2, 2.3, 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.9 Technology: 4.1, 4.2, 4.3 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.6, 6.7, 6.8 Responsibility and Flexibility: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7 Ethics and Legal Responsibility: 8.1, 8.3, 8.4, 8.5 Leadership and Teamwork: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6 Technical Knowledge and Skills: 10.1, 10.2, 10.4, 10.6 Demonstration and Application: 11.1, 11.2, 11.3, 11.4, 11.5</p> <p>CTE Pathway: C1.1, C7.1, C7.2, C7.3, C7.4, C7.5, C7.6</p>

SUGGESTED INSTRUCTIONAL MATERIALS and OTHER RESOURCES

TEXTBOOKS

Caputo, Anthony. Digital Video Surveillance and Security. Elsevier Science, 2010.

Gilster, Ron. HTI+ Home Technology Integrator and CEDIA Installer I Exam Guide/Reference Book. McGraw Hill (Osborn), 2005.

O'Driscoll, Gerard, Stuart C. Palmer, and Whitney G. Freeman. HTI+ Certification Concepts and Practice. Exam Prep. Marcraft International Corporation, 2006.

Vanston, John, Wayne Caswell, Henry Elliott, and Michael Betterworth. Home Technology Integration: A Technology Forecast. Texas State Technical College Publishing, 2007.

Wells, Quentin. Guide to Digital Home Technology Integration. Cengage Learning, 2008.

RESOURCES

Employer Advisory Board members

Subject area advisor

CTE Foundation Standards

<http://www.cde.ca.gov/ci/ct/sf/documents/ctestandards.pdf>

<http://www.cde.ca.gov/be/st/ss/documents/ctestandards.doc>

www.americangreenjobs.net

<http://www.renewableenergyjobs.com/>

<http://careers.pennenergyjobs.com>

<http://www.cleantechrecruits.com>

Digital Home Technology Integrator Certification CEA-CompTIA DTI+ Examination Objectives HT0-201

http://www.comptia.org/global/Libraries/DE-Docs/DTI_2006_Objectives_HT0-201.sflb.ashx

COMPETENCY CHECKLIST

TEACHING STRATEGIES and EVALUATION

METHODS AND PROCEDURES

- A. Lectures and discussion
- B. Multimedia presentations
- C. Demonstrations and participation
- D. Individualized instruction
- E. Peer teaching
- F. Role playing
- G. Guest speakers
- H. Field trips and field study experiences
- I. Projects

EVALUATION

SECTION A – Introduction and Safety – Pass a written exam on classroom and workplace safety with a score of 100%.

SECTION B – Resource Management Review – Pass all assignments and exams on resource management principles with a minimum score of 80% or higher.

SECTION C – Home Security and Access Control Systems – Pass all assignments and exams on home security and access control systems with a minimum score of 80% or higher.

SECTION D – Heating, Ventilation, and Air Conditioning (HVAC) Management Systems – Pass all assignments and exams on heating, ventilation, and air conditioning (HVAC) management systems with a minimum score of 80% or higher.

SECTION E – Home Irrigation and Pool Management Systems – Pass all assignments and exams on home irrigation and pool management systems with a minimum score of 80% or higher.

SECTION F – Lighting and Lighting Control Systems – Pass all assignments and exams on lighting and lighting control systems with a minimum score of 80% or higher.

SECTION G – Miscellaneous Devices – Pass all assignments and exams on miscellaneous devices with a minimum score of 80% or higher.

SECTION H – Entrepreneurial Skills – Pass all assignments and exams on entrepreneurial skills with a minimum score of 80% or higher.

Statement for Civil Rights

All educational and vocational opportunities are offered without regard to race, color, national origin, gender, or physical disability.
