

**BITA 3: ENERGY EFFICIENCY AND INFRASTRUCTURE OF THE FUTURE**

**INDUSTRY SECTOR:** Building and Construction Trades Sector  
**PATHWAY:** Residential and Commercial Construction  
**CALPADS TITLE:** Intermediate Residential and Commercial Construction (Concentrator)  
**CALPADS CODE:** 7341

**HOURS:**

Total	Classroom	Laboratory/CC/CVE
180	90	90

JOB TITLE	O*NET CODE	JOB TITLE	O*NET CODE
Electricians	47-2111.00	Construction Carpenters	47-2031.01
Roofers	47-2181.00	Plumbers, Pipefitters, and Steamfitters	47-2152.00
Insulation Workers, Floor, Ceiling, and Wall	47-2131.00	Cement Masons and Concrete Finishers	47-2051.00

**COURSE DESCRIPTION:**

This course will identify ways to conserve resources in construction, select alternative tools and tool maintenance for use in green building, identify alternative practices and methods that take natural resources into account, and recycle reduce or dispose of construction materials.

Students will gain an understanding of what sustainability means, what drives it and how it impacts the environment, and recognize relevant national and international policy, legislation and governance issues, and expected future direction. They will also understand the latest evidence and thinking on climate change, energy, water, pollution, waste, biodiversity and efficient use of materials within the built environment and appreciate how businesses are changing in order to address sustainability and explore the risks and opportunities this can bring.

Students begin to perceive the development of housing from the planning stages; land development and procurement, the optimal placement for construction, and working with natural elements as resources to become zero-net energy.

**A-G APPROVAL:** G  
**ARTICULATION:** None  
**DUAL ENROLLMENT:** None

**PREREQUISITES:**

Prerequisite
BITA 2: STUDY OF MODERN CRAFTSMANSHIP AND INFRASTRUCTURE
BITA 1: FOUNDATION OF RESIDENTIAL AND COMMERCIAL CONSTRUCTION

**METHODS OF INSTRUCTION**

- Direct instruction
- Group and individual applied projects
- Multimedia
- Demonstration
- Field trips
- Guest speakers

**STUDENT EVALUATION:**

- Student projects
- Written work
- Exams
- Observation record of student performance
- Completion of assignments

**INDUSTRY CERTIFICATION:**

- None

**RECOMMENDED TEXTS:**

- None

**PROGRAM OF STUDY**

Grade	Fall	Spring	Year	Course Type	Course Name
9, 10, 11, 12			✓	Introductory	Building Industry Technology Academy (BITA) 1
10, 11, 12			✓	Concentrator	Building Industry Technology Academy (BITA) 2
11, 12			✓	Concentrator	BITA 3: ENERGY EFFICIENCY AND INFRASTRUCTURE OF THE FUTURE
12			✓	Capstone	Building Industry Technology Academy (BITA) 4

I.	INTRODUCTION, ORIENTATION, AND SAFETY	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <li>● Demonstrate awareness of course objectives and competencies</li> <li>● Demonstrate an understanding of course requirements and student expectations</li> <li>● Demonstrate awareness of the industry standards and career opportunities</li> <li>● Identify general shop safety practices/expectations and demonstrate knowledge of a safe attitude</li> </ul>	2	1	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.2 <b>CTE Anchor:</b> Career Planning and Management: 3.4 Health and Safety: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.8, 6.12 Responsibility and Flexibility: 7.7 <b>CTE Pathway:</b> D1.1
II.	TITLE 24 ENERGY STANDARDS	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <li>● Understand the history and intent of the California Energy Code</li> <li>● Understand the future goals for California's Energy Code and its impact on the construction industry</li> <li>● Describe the difference between mandatory, prescriptive, and performance requirements</li> <li>● Define the mandatory wall and attic assembly requirements</li> <li>● Identify key strategies for meeting or exceeding the prescriptive HPW (High Performance Wall) requirements</li> <li>● Define and illustrate a high-performance wall and attic assembly</li> </ul>	5	5	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.1 RHSS : 11-12.7 RLST : 11-12.2, 11-12.4 G-MG: 3 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.4 Ethics and Legal Responsibilities: 8.2 Technical Knowledge and Skills: 10.1, 10.2 <b>CTE Pathway:</b> D1.2, D9.1
III.	SOLAR	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <li>● Understand contributing factors to layout placement/design</li> <li>● Read and interpret solar array layout design documents</li> <li>● Develop and apply basic skills in roof penetration, flashing, and waterproofing .</li> <li>● Locate center of rafter/top-cord, pilot drilling, roof attachment, and torque verification</li> <li>● Understand racking assembly, adjustability, leveling and planning for array uniformity</li> <li>● Maximize teamwork to assist in module placement and attachment</li> <li>● Name and identify all racking components and connectors</li> <li>● Name and identify micro inverter wiring components</li> <li>● Lay out and install modules from permit sets/engineering drawings</li> <li>● Identify the tools and equipment used by solar installers today</li> <li>● Lay out trunk cables and install with accessories for proper operation</li> <li>● Demonstrate safe working procedures in a construction and shop/lab environment</li> <li>● Complete rooftop wear management</li> <li>● Complete project documentation</li> <li>● Work cooperatively as a member of a team</li> <li>● Identify hazards and how to avoid or minimize them in the workplace</li> </ul>	16	39	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2, 11-12.7 RLST : 11-12.3, 11-12.4 G-SRT: 8 N-Q: 3 CC: 3 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.2, 5.3 Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.4, 6.6, 6.8, 6.12 Responsibility and Flexibility: 7.4, 7.5 Ethics and Legal Responsibilities: 8.1 Leadership and Teamwork: 9.7 Technical

				Knowledge and Skills: 10.1, 10.2, 10.3, 10.5 <b>CTE Pathway:</b> D1.2, D1.3, D2.1, D2.2, D2.3, D3.1, D3.2, D3.3, D3.5, D3.6, D3.7, D9.2, D9.4, D9.5, D9.6, D9.1
<b>IV.</b>	<b>FINISH CARPENTRY</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>● Demonstrate the basic care, proper maintenance, and use of hand, portable, and stationary tools related to the Building and Construction trades</li> <li>● Demonstrate proper installation techniques of interior finish materials and protective finishes</li> <li>● Demonstrate the application of exterior finish materials and protective finish in building construction.</li> <li>● Estimate the materials needed to complete a specific task</li> <li>● Use measurements and follow blueprints for the building process</li> <li>● Install door casing and trim, doors, crown molding, base and other interior trim; and explain layout and installation procedures for these elements</li> <li>● Identify window casing components and explain layout and installation for these elements in building construction</li> <li>● Identify the types of moldings and explain layout and installation procedures for these elements.</li> <li>● Identify the types of millwork and explain layout and installation procedures for these elements</li> <li>● Identify the tools, power tools and materials used in interior and exterior finish</li> <li>● Apply various interior and exterior finishes per specifications</li> <li>● Identify the materials, tools and power tools used in stair construction</li> <li>● Calculate the number of risers and trends needed</li> <li>● Layout cut and installs stair stringers</li> <li>● Cut and install stair stringer, risers and trends</li> </ul>	30	45	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.7 RLST : 11-12.3, 11-12.4 G-GMD: 4 G-MG: 2, 3 N-Q: 3 CC: 3 PS: PS3, PS3.A ETS: ETS2 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.1, 5.2, 5.3 Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.8, 6.11, 6.12 Responsibility and Flexibility: 7.5 Ethics and Legal Responsibilities: 8.3 Leadership and Teamwork: 9.7 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5 <b>CTE Pathway:</b> D2.3, D2.1, D2.2, D3.1, D3.3, D3.5, D3.6, D7.1, D7.2, D7.3, D7.4, D7.5, D7.6, D7.7, D7.8, D9.1, D9.2
<b>V.</b>	<b>EMPLOYMENT LITERACY: PROJECTS 1 &amp; 2: CAREER EXPLORATION RESEARCH AND CAREER PORTFOLIO</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>● Create a career roadmap in area of choice.</li> <li>● Research what requirements (educational and personal) are needed in order to reach career goal.</li> <li>● Present their career they “can’t not do” and their interview with someone that has their career they are seeking.</li> <li>● Create and present short term, midterm, and long-term career goals</li> <li>● Create and compile resources for obtaining employment such as sample job application, resume, cover letter, LinkedIn profile, elevator pitch, and sample response to interview questions</li> <li>● Identify available positions in the industry through the use of the internet</li> <li>● Complete an application form correctly</li> <li>● Prepare a written resume</li> <li>● Participate in a simulated employment interview</li> <li>● Prepare a portfolio</li> </ul>	25	0	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2 RLST : 11-12.2 WS : 11-12.2, 11-12.4 WHSST : 11-12.4, 11-12.5, 11-12.6, 11-12.7 <b>CTE Anchor:</b> Communications: 2.3, 2.4, 2.5 Career Planning

				and Management: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.8, 3.9 CTE Pathway: D1.1
<b>VI.</b>	<b>PERSONAL SKILLS RELATED TO EMPLOYMENT</b>	<b>CR</b>	<b>Lab/ CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>● Demonstrate promptness, attend class regularly, and follow absence notification procedures</li> <li>● Develop and maintain acceptable working relations</li> <li>● Demonstrate the ability to manage time wisely</li> <li>● Demonstrate a positive and cooperative attitude</li> <li>● Demonstrate values of honesty and integrity</li> <li>● Demonstrate respect for instructor and site supervisor</li> <li>● Dress in a professional manner according to industry standards Demonstrate appropriate personal hygiene/grooming</li> <li>● Demonstrate responsibility by exerting a high level of effort and working toward a goal</li> </ul>	3	0	<b>Academic:</b> LS: 11-12.6 <b>CTE Anchor:</b> Responsibility and Flexibility: 7.2, 7.3, 7.4, 7.5, 7.7 Ethics and Legal Responsibilities: 8.2, 8.3, 8.7 <b>CTE Pathway:</b> D1.1
<b>VII.</b>	<b>INTERPERSONAL SKILLS AND GROUP DYNAMICS</b>	<b>CR</b>	<b>Lab/ CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>● Demonstrate the ability to work as a member of a team</li> <li>● Identify proper procedures for handling harassment</li> <li>● Demonstrate leadership skills by working independently, making appropriate decisions, working well with others and accepting constructive criticism</li> <li>● Demonstrate the ability to accept and work with individuals from various cultures</li> </ul>	3	0	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.7 RLST : 11-12.2 WS : 11-12.2 SEP: 1, 4, 6 <b>CTE Anchor:</b> Leadership and Teamwork: 9.2, 9.3 <b>CTE Pathway:</b> D1.1
<b>VIII.</b>	<b>THINKING AND PROBLEM-SOLVING SKILLS</b>	<b>CR</b>	<b>Lab/ CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>● Describe problem-solving techniques</li> <li>● Understand logical reasoning</li> <li>● Demonstrate creative thinking</li> <li>● Participate in decision-making</li> <li>● Demonstrate the ability to interpret information correctly</li> </ul>	3	0	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.2, 11-12.3 WS : 11-12.2 SEP: 1, 4, 6 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 <b>CTE Pathway:</b> D1.1
<b>IX.</b>	<b>COMMUNICATION SKILLS</b>	<b>CR</b>	<b>Lab/ CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>● Demonstrate effective verbal and written skills</li> <li>● Read technical journals, and write technical reports using appropriate terminology</li> <li>● Listen attentively, follow directions, and relay directions to others</li> <li>● Demonstrate the ability to research and retrieve information</li> </ul>	3	0	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2 RLST : 11-12.2 WS : 11-12.2 <b>CTE Anchor:</b> Communications: 2.4, 2.5 <b>CTE Pathway:</b> D1.1

Entered by: