

**BITA 1: FOUNDATION OF RESIDENTIAL AND COMMERCIAL CONSTRUCTION**

**INDUSTRY SECTOR:** Building and Construction Trades Sector  
**PATHWAY:** Residential and Commercial Construction  
**CALPADS TITLE:** Introduction to Residential and Commercial Construction  
**CALPADS CODE:** 7340

**HOURS:**

Total	Classroom	Laboratory/CC/CVE
180	106	74

JOB TITLE	O*NET CODE	JOB TITLE	O*NET CODE
Helpers--Carpenters	47-3012.00	Carpenters	47-2031.00
Construction Managers	11-9021.00	First-Line Supervisors of Construction Trades and Extraction Workers	47-1011.00

**COURSE DESCRIPTION:**

The Residential and Commercial Construction course is designed to teach basic skills for the construction trades through a course rich in connections to construction projects that will generate interest in the math and increase students' likelihood of success. The course covers basic construction math, measurement and scale, blueprint reading, safety, and procedural use of hand and power tools. Students acquire these skills through the use of technology and real world problem solving. Integrated throughout the course are foundation standards, which include communication, ethics, interpersonal/team skills, critical thinking and other employment skills needed for the 21st Century.

**A-G APPROVAL:** G

**ARTICULATION:** None

**DUAL ENROLLMENT:** None

**PREREQUISITES:**

Prerequisite
None

## 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	BITA 1: FOUNDATION OF RESIDENTIAL AND COMMERCIAL CONSTRUCTION
10, 11, 12			✓	Concentrator	BITA 2: STUDY OF MODERN CRAFTSMANSHIP AND INFRASTRUCTURE
11, 12			✓	Concentrator	BITA 3: ENERGY EFFICIENCY AND INFRASTRUCTURE OF THE FUTURE
12			✓	Capstone	BITA 4: EMERGING CONSTRUCTION ADVANCES & CHANGES

I.	INTRODUCTION AND ORIENTATION	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> </ul>	2	0	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.2 <b>CTE Anchor:</b> Career Planning and Management: 3.4 <b>CTE Pathway:</b> D1.1
II.	INDUSTRIAL SAFETY	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <li>• Identify general shop safety practices/expectations</li> <li>• Demonstrate knowledge of a safe attitude</li> <li>• Answer questions concerning occupational safety based on graphic information</li> <li>• Recognize the different types and components of graphs</li> <li>• Use various strategies in the interpretation of information presented visually</li> <li>• Use data analysis/statistics to make generalizations about occupational safety in differing fields</li> <li>• Recognize terms that are commonly used in the analysis of data and statistics</li> <li>• Identify the key factors that facilitate effective group/team operation</li> </ul>	5	4	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2, 11-12.7 RHSS : 11-12.7 RLST : 11-12.2 WS : 11-12.2 <b>CTE Anchor:</b> Career Planning and Management: 3.4 Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12 <b>CTE Pathway:</b> D1.1, D1.3, D1.2
III.	MEASUREMENT	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <li>• Identify the five major math disciplines used in the construction industry</li> <li>• Identify and correctly spell "measurement terminology"</li> <li>• Use both standard and metric units in determining given lengths using a tape measure</li> <li>• Identify proper and improper fractions and mixed numbers</li> <li>• Convert improper fractions and mixed numbers back and forth</li> <li>• Identify the LCD and borrow from whole numbers in the addition and subtraction of fractions</li> <li>• Convert fractions into decimals</li> <li>• Add any two mixed numbers using only a tape measure</li> </ul>	5	5	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.3 G-GMD: 5 G-MG: 3 G-SRT: 8 SEP: 6 CC: 1 ETS: ETS1 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.3, 5.4 Technical Knowledge and Skills: 10.1, 10.3 <b>CTE Pathway:</b> D2.1, D2.2, D2.3, D2.4, D3.1, D3.5
IV.	SCALE	CR	Lab/ CC	Standards

	<ul style="list-style-type: none"> <li>Define the meanings of the words scale, ratio, proportion, and scale factor</li> <li>Measure given lengths in given scales using an architect's rule/scale</li> <li>Read a scale drawing</li> <li>Find a scaling factor when scaling an object</li> <li>Apply measurement procedures in context and then translating those measurements to a scale drawing</li> <li>Understand that a scale drawing is two-dimensional drawing that accurately represents an object and is mathematically similar to the object</li> <li>Use Google sketch up (cad), build a three-dimensional object based on twodimensional drawings</li> <li>Build to scale a tiny house model that includes the floor, walls, windows and door</li> </ul>	6	5	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.3 G-GMD: 5 G-MG: 3 G-SRT: 8 SEP: 6 CC: 1 ETS: ETS1 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.3, 5.4 Technical Knowledge and Skills: 10.1, 10.3 <b>CTE Pathway:</b> D2.4, D2.3, D2.2, D2.1, D3.1, D3.5
<b>V.</b>	<b>POWER TOOL - TABLE SAW</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>Identify each of the major components of the Table Saw, and their purpose</li> <li>Describe the uses of the Table Saw</li> <li>Demonstrate the safe operation of the Table Saw</li> <li>Identify each of the major components of the Radial-Arm Saw and their purpose</li> <li>Describe the use and operation of the Radial-Arm Saw</li> <li>Demonstrate the safe operation of the Radial-Arm Saw</li> <li>Recognize machine design factors that lead to "Lefty's" having a higher incidence of accidents than "Righty's"</li> </ul>	3	3	<b>Academic:</b> RLST : 11-12.3 <b>CTE Anchor:</b> Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.12 <b>CTE Pathway:</b> D4.1, D5.10, D6.6
<b>VI.</b>	<b>MATERIALS, FASTENERS AND TOOLS</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>Identify tree species and recognize a hard or soft wood based on the physical properties of the tree</li> <li>Correctly identify and spell the 12 primary physiological tree terms</li> <li>Identify the three basic steps involved in turning a tree into lumber</li> <li>Support their opinion on past and current forestry practices</li> <li>Formulate and express an opinion using support from what they have read and seen</li> <li>Explain the history/development of glues, nails, and screws; their attributes and applications</li> <li>Identify 5 types of nails/brads             <ul style="list-style-type: none"> <li>Common nail</li> <li>Sinker</li> <li>Finish nail</li> <li>Brad (nail)</li> <li>Pin</li> </ul> </li> <li>Identify the major woodworking hand tools and their proper function/use</li> <li>Demonstrate the proper use of the major woodworking hand tools</li> <li>Obtain and apply information found in working drawings to a given project</li> </ul>	12	12	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.2, 11-12.3 WS : 11-12.2 <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.4 Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.11, 6.12 Technical Knowledge and Skills: 10.1, 10.2, 10.3 <b>CTE Pathway:</b> D4.1, D5.1, D5.10, D6.6, D7.1, D7.6, D8.6, D8.7, D8.8, D10.1
<b>VII.</b>	<b>POWER TOOL - BAND SAW</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>

	<ul style="list-style-type: none"> <li>Identify each of the major components of the Band Saw and their purpose</li> <li>Describe the use and operation of the Band Saw</li> <li>Demonstrate the safe operation of the Band Saw</li> </ul>	2	2	<b>Academic:</b> RLST : 11-12.3 <b>CTE Anchor:</b> Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.12 <b>CTE Pathway:</b> D4.1, D5.10, D6.6
<b>VIII.</b>	<b>POWER TOOL - MITER SAW</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>Identify each of the major components of the Miter Saw and their purpose</li> <li>Describe the uses of the Miter Saw</li> <li>Demonstrate the safe operation of the Miter Saws</li> </ul>	2	2	<b>Academic:</b> RLST : 11-12.3 <b>CTE Anchor:</b> Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.12 <b>CTE Pathway:</b> D4.1, D5.10, D6.6
<b>IX.</b>	<b>MACHINE PROJECT #1</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>Identify blueprints, bluelines, and CAD prints</li> <li>Obtain the information they need from a schematic or working drawing</li> <li>Develop a bill-of-materials</li> <li>Build a three-dimensional object based on two-dimensional drawings</li> </ul>	8	7	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2 RLST : 11-12.2, 11-12.3 G-GMD: 1 G-MG: 1 ETS: ETS1, ETS1.A, ETS1.B, ETS1.C <b>CTE Anchor:</b> Communications: 2.4 Problem Solving and Critical Thinking: 5.2 Technical Knowledge and Skills: 10.1 <b>CTE Pathway:</b> D2.2, D2.1, D3.1, D3.6, D3.7, D3.2, D3.3, D3.4, D3.5
<b>X.</b>	<b>DRILL ROUTER SANDER</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>Identify the Router, Disc and Palm Sanders, the cordless Driver/Drill, and their major components</li> <li>Demonstrate the safe operation of each tool</li> <li>Identify/describe the six primary drill bits used in the construction industry, and their uses             <ul style="list-style-type: none"> <li>Twist</li> <li>Auger</li> <li>Forstner</li> <li>Spade/Butterfly</li> <li>Hole Saw</li> <li>Self-Feed</li> </ul> </li> <li>Identify the three basic router bits used in the shop</li> </ul>	6	6	<b>Academic:</b> LS: 11-12.6 RLST : 11-12.3 <b>CTE Anchor:</b> Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.11, 6.12 Technical Knowledge and Skills: 10.1, 10.3 <b>CTE Pathway:</b> D4.1, D5.10, D6.6,

	<ul style="list-style-type: none"> <li>• increasing strength</li> <li>• Round-Over</li> <li>• Rabbeting</li> </ul> <ul style="list-style-type: none"> <li>• Identify Aluminum Oxide and Garnet sandpaper, and describe their attributes/differences</li> </ul>			D10.1
<b>XI.</b>	<b>MACHINE PROJECT #2</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>• Identify blueprints, bluelines, and CAD prints</li> <li>• Obtain the information needed from a schematic, or working drawing</li> <li>• Develop a bill-of-materials</li> <li>• Build a three-dimensional object based on two-dimensional drawings</li> </ul>	6	6	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2 RLST : 11-12.2, 11-12.3 G-GMD: 1 G-MG: 1 ETS: ETS1.A, ETS1.B, ETS1.C, ETS1 <b>CTE Anchor:</b> Communications: 2.4 Problem Solving and Critical Thinking: 5.2 Technical Knowledge and Skills: 10.1 <b>CTE Pathway:</b> D2.1, D2.2, D3.1, D3.2, D3.7, D3.4, D3.3, D3.6, D3.5
<b>XII.</b>	<b>JIG SAW AND SCROLL SAW</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>• Identify the components on the Jigsaw and the Scroll Saw</li> <li>• Demonstrate the safe operation of each tool</li> </ul>	3	2	<b>Academic:</b> RLST : 11-12.3 <b>CTE Anchor:</b> Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.12 <b>CTE Pathway:</b> D4.1, D5.10, D6.6
<b>XIII.</b>	<b>PNEUMATICS: NAILERS, STAPLERS AND COMPRESSORS</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>• Identify the major components of both the pneumatic nailer and stapler</li> <li>• Demonstrate the safe operation of each tool</li> <li>• Identify/describe the different types of nailers and staplers and their use</li> <li>• Identify several (min.3) uses for each type of tool</li> <li>• Demonstrate basic compressor operations and safety</li> </ul>	4	4	<b>Academic:</b> RLST : 11-12.3 <b>CTE Anchor:</b> Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.5, 6.6, 6.12 <b>CTE Pathway:</b> D4.1, D5.10, D6.6
<b>XIV.</b>	<b>SCHEMATICS/BLEUPRINTS AND VISUALIZATION</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>

	<ul style="list-style-type: none"> <li>• Identify the five components of a set of residential blueprints <ul style="list-style-type: none"> <li>• Plans</li> <li>• Elevations</li> <li>• Sections</li> <li>• Details</li> <li>• Specifications</li> </ul> </li> <li>• Describe the differences between the five components of residential blueprints</li> <li>• Draw a 3D object in 3 different elevations</li> <li>• Take notes using the Cornell Notes format</li> </ul>	3	3	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2 RLST : 11-12.2, 11-12.3 G-GMD: 1 G-MG: 1 ETS: ETS1.B, ETS1.A, ETS1, ETS1.C <b>CTE Anchor:</b> Problem Solving and Critical Thinking: 5.2 Technical Knowledge and Skills: 10.1 <b>CTE Pathway:</b> D2.2, D2.1, D3.1, D3.2, D3.7, D3.5, D3.6, D3.3, D3.4
<b>XV.</b>	<b>CONSTRUCTION COMPANY ORGANIZATION AND OPERATIONS</b>	<b>CR</b>	<b>Lab/CC</b>	<b>Standards</b>
	<ul style="list-style-type: none"> <li>• Identify the basic organization of a corporation, its officers, and their responsibilities</li> <li>• Work effectively as part of a team/company</li> <li>• Identify the three basic types of companies</li> </ul>	4	1	<b>Academic:</b> LS: 11-12.6 RSIT : 11-12.2, 11-12.7 RLST : 11-12.2, 11-12.3 WS : 11-12.2, 11-12.4 SEP: 1, 4, 6 <b>CTE Anchor:</b> Communications: 2.4, 2.5 Career Planning and Management: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4 Health and Safety: 6.1, 6.1, 6.2, 6.3, 6.6, 6.11, 6.12 Responsibility and Flexibility: 7.2, 7.3, 7.4, 7.5, 7.7 Ethics and Legal Responsibilities: 8.2, 8.3, 8.7 Leadership and Teamwork: 9.2, 9.3 Demonstration and Application: 11.5 <b>CTE Pathway:</b> D1.2, D1.3, D1.1

XVI.	SCALE MODEL HOUSE	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <li>• Obtain the information needed from a schematic, or working drawing</li> <li>• Develop a bill-of-materials</li> <li>• Build a three-dimensional object based on two-dimensional drawings</li> <li>• Convert fractions to decimals</li> <li>• Calculate board footage</li> <li>• Estimate the cost of a given project, based on a shop print/drawing</li> </ul>	13	12	<p><b>Academic:</b>            LS: 11-12.6            RSIT : 11-12.2            RLST : 11-12.2,            11-12.3            WS : 11-12.2            G-GMD: 1, 5            G-MG: 1, 3            G-SRT: 8            SEP: 6            CC: 1            ETS: ETS1,            ETS1.A, ETS1.B,            ETS1.C</p> <p><b>CTE Anchor:</b>            Communications:            2.3, 2.4, 2.5, 2.6            Problem Solving            and Critical            Thinking: 5.2, 5.3,            5.4            Technical            Knowledge and            Skills: 10.1, 10.3</p> <p><b>CTE Pathway:</b>            D2.2, D2.1, D2.3,            D2.4, D3.2, D3.1,            D3.3, D3.4, D3.5,            D3.6, D3.7, D9.1,            D9.3</p>
XVII.	EMPLOYMENT LITERACY	CR	Lab/ CC	Standards
	<ul style="list-style-type: none"> <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>	10	0	<p><b>Academic:</b>            LS: 11-12.6            RSIT : 11-12.2            RLST : 11-12.2            WS : 11-12.2,            11-12.4</p> <p><b>CTE Anchor:</b>            Communications:            2.4, 2.5            Career Planning            and Management:            3.1, 3.2, 3.3, 3.4,            3.5, 3.6, 3.7, 3.9            Demonstration and            Application: 11.5</p> <p><b>CTE Pathway:</b>            D1.1</p>
XVIII.	PERSONAL SKILLS RELATED TO EMPLOYMENT	CR	Lab/ CC	Standards



	<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 others</li> <li>• Demonstrate appropriate personal hygiene/grooming, and dress</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>XIX.</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>• Utilize problem-solving techniques</li> <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>XX.</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>XXI.</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

