



Course Title: BUILDING AND CONSTRUCTION TECHNOLOGY 2

Course Number: TIU5814

Instructor:

Course Content: This course features advanced study of building construction technology. Students are provided with experiences in layout, fabrication, assembly, and installation of structural units. Also included are estimating and calculating costs, and quality control processes through simulated class and on-the-job experiences. Recommended Prerequisite: Completion of TIC5010 IET Career Pathway Core and TIU5800 Building and Construction Technology 1. This is a 1-credit non-repeatable elective course.

College Credit: This course is being taught by a University of Hawai'i – Hawai'i Community College faculty member in cooperation with DOE personnel. This is a college course and students are expected to conduct themselves in accordance with the same rules and regulations required of college students.

Students successfully completing BUILDING AND CONSTRUCTION TECHNOLOGY 2, Course Number TIU5810 with a grade of "B" or better who enroll in Hawai'i Community College (Hilo or Kealahou) may receive credit for CARP 20A – Basic Carpentry I, a 3-credit College Course.

All instructional costs, materials and supplies are funded by the college via a special appropriation from the state legislature.

Course Topics:

- a. Proper and safe use of tools
- b. Shop safety
- c. Basic construction materials and fasteners
- d. Construction math
- e. Employability skills and work ethics
- f. Communication
- g. Construction processes
- h. Codes and regulations
- i. Career Opportunities
- j. Customer satisfaction
- k. Quality work

Safety:

Students must wear covered shoes, long pants, a shirt with sleeves and appropriate safety gear (hard hat, safety glasses) when working in the shop/lab facility. Safety gear will be provided by the instructor. Students should bring a set of work clothes (long pants, shirt with sleeves, covered shoes) which they can leave in class and change into prior to working in the shop/lab facility.

Student Responsibilities:

1. Attend class
2. Report to class on time, ready to learn and participate
3. Follow safety rules and practices at all times
4. Dress appropriately
5. Keep classroom and shop/lab area clean
6. Return tools to their proper location when not in use
7. Report any accident to the instructor immediately
8. Respect fellow students, instructor(s) and guests
9. Complete work assignments as scheduled
10. No horse play in classroom or shop/lab area

DOE Standards and Student Learner Outcomes:

Standard	Student Learner Outcomes	Assessment
Apply appropriate and safe behaviors and practices in school, community, and workplace.	<ol style="list-style-type: none"> 1. Demonstrate the ability to follow shop safety rules. 2. Identify the responsibilities and personal characteristics of a professional craftsperson 3. Explain the role that safety plays in the carpentry trade 4. Describe what “Job-Site” safety means 5. Explain the appropriate safety precautions around common job-site hazards 6. Demonstrate the use and care of appropriate personal protective equipment 7. Describe safe behavior on and around ladders and scaffolds 8. Follow safe procedures for lifting heavy objects 9. Explain the importance of the HazCom requirement and MSDS 10. Describe fire prevention and fire fighting techniques 11. Define safe work procedures around electrical hazards 	<ol style="list-style-type: none"> a. Shop safety exam b. General safety exam c. Individual tool safety exams d. Employability Skills Rubric e. Construction Project Rubric
Demonstrate and develop effective communication skills	<ol style="list-style-type: none"> 1. Demonstrate the ability to understand information and instructions that are presented in both written and verbal form 2. Demonstrate the ability to communicate effectively in on-the-job situations using written and verbal skills 	<ol style="list-style-type: none"> a. Employability Skills rubric b. Magazine Article Rubric

Standard	Student Learner Outcomes	Assessment
Use math skills to solve problems related to construction plans	<ol style="list-style-type: none"> 1. Add, subtract, multiply, and divide whole numbers, with and without the use of a calculator 2. Use a standard ruler and a metric ruler to measure 3. Add, subtract, multiply, and divide fractions 4. Add, subtract, multiply, and divide decimals, with and without a calculator 5. Convert decimals to percents and percents to decimals 6. Convert fractions to decimals and decimals to fractions 7. Explain what the metric system is and how it is important in the construction industry 8. Recognize and use metric units of length, weight, volume, and temperature 9. Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them. 	<ol style="list-style-type: none"> a. Standardized Pre Test 4th or 5th week of 1st quarter b. Periodic Math Assessments c. Construction project Rubric d. Standardized Post Test 1st or 2nd week of last quarter
Develop and demonstrate employability skills	<ol style="list-style-type: none"> 1. Explain the construction industry, the role of the companies that make up the industry, and the role of individual professionals in the industry 2. Demonstrate critical thinking skills and the ability to solve problems using those skills 3. Demonstrate Knowledge of computer skills and explain common uses for computers in the construction industry 4. Demonstrate effective relationship skills with teammates and supervisors, exhibit the ability to work on a team, and demonstrate appropriate leadership skills 5. Be aware of workplace issues such as sexual harassment, stress, and substance abuse 6. Explain the importance of safety in the construction industry 7. Demonstrate appropriate personal attributes sought by employers 	<ol style="list-style-type: none"> a. Employability Skills Rubric b. Construction Project Rubric
Recognize and demonstrate technical knowledge of building materials (i.e. wood building materials, fasteners, and adhesives)	<ol style="list-style-type: none"> 1. Explain the terms commonly used in discussing wood and lumber 2. State the uses of various types of hardwoods and softwoods 3. Identify various types of imperfections that are found in lumber 4. Explain how lumber is graded 5. Interpret grade markings on lumber and plywood 6. Identify various types of building boards and identify its uses 7. Identify the uses of and safety precautions associated with pressure treated and fire retardant lumber 	<ol style="list-style-type: none"> a. Material Identification b. Standard Mid-Term Exam c. Construction Project Rubric c. Standard Comprehensive Final Exam

Standard	Student Learner Outcomes	Assessment
Recognize and demonstrate technical knowledge of building materials (continued)	8. State the uses of various types of engineered lumber 9. Calculate the quantities of lumber and wood products using industry standard methods 10. List the basic nail and staple types and their uses 11. List the basic types of screws and their uses 12. Identify the different types of anchors and their uses 13. Describe the common types of adhesives used in construction work and explain their uses	
Demonstrate the ability to read blueprints	1. Recognize and identify basic blueprint terms, components, and symbols 2. Relate information on blueprints to actual locations on prints 3. Recognize different classifications of drawings 4. Interpret and use drawing dimensions	a. Blueprint Rubric b. Construction Project Rubric
Demonstrate industry standard practices for various carpentry processes (i.e. floor systems, wall and ceiling framing, roof framing, and windows/doors) in constructing a real world project	1. Floor Systems <ul style="list-style-type: none"> ▪ Identify the different types of framing systems ▪ Read and understand drawings and specifications to determine floor system requirements ▪ Identify floor and sill framing and support members ▪ Name methods used to fasten sills to foundations ▪ List and recognize different types of floor joists ▪ Explain the purpose of subflooring and underlayment ▪ Match selected fasteners used in floor framing to their correct uses ▪ Estimate the amount of materials needed to frame a floor assembly ▪ Demonstrate the ability to: Layout and construct a floor assembly, install bridging, install joists, and install a subfloor 2. Wall and Ceiling Systems <ul style="list-style-type: none"> ▪ Identify the components of a wall and ceiling layout ▪ Describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition T's, bracing, and fire stops ▪ Describe the common materials and techniques used for installing sheathing on walls ▪ Layout, assemble, and erect a exterior wall ▪ Explain the use of metal studs in wall framing ▪ Describe the correct procedure for laying out a ceiling ▪ Cut and install ceiling joists ▪ Estimate materials required to frame walls and ceilings 	a. Employability skills Rubric b. Construction Project Rubric c. Magazine Article Rubric d. Standard Mid-Term Exam e. Standard Final Exam f. Material Identification

Standard	Student Learner Outcomes	Assessment
Demonstrate industry standard practices for various carpentry processes (continued)	<ol style="list-style-type: none"> 3. Roof Framing <ul style="list-style-type: none"> ▪ Understand terms associated with roof framing ▪ Identify the roof framing members used in gable and hip roofs ▪ Identify methods used to calculate the length of a rafter ▪ Identify the various types of trusses used in roof framing ▪ Use a framing square, speed square, and calculator in laying out a roof ▪ Construct a framed roof ▪ Estimate the materials used in framing a roof 4. Windows and Doors <ul style="list-style-type: none"> ▪ Identify the various types of windows ▪ Identify the parts of a window installation ▪ State the requirements for a proper window installation ▪ Install a pre-hung window ▪ Identify the various types of doors ▪ Identify the parts of a door installation ▪ Install a pre-hung door ▪ Identify the various types of locksets used ▪ Install a lockset 	