Building Technology

Organization
Washburn Institute of Technology

Program Number
46.0401

Instructional Level
Certificate

Target Population
Grades 11 & 12
Post-secondary

Description
This program prepares individuals to apply technical knowledge and skills in building technology. The knowledge and skills address maintenance of a building’s function and service within both commercial and residential structures. Instruction includes basic theory and hands-on laboratory in electrical, carpentry, plumbing, heating ventilation, and air conditioning. Upon completion students are qualified for employment in the construction and maintenance of hospitals, motels, apartment complexes, schools, and other businesses. Students have the opportunity to earn EPA Section 608 Certification.

Entry Requirements
WorkKeys®
Applied Math Level 4
Reading for Information Level 4

Assessment Plan
Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution’s technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

Student Learning Outcomes
A. Communicate effectively.
B. Integrate technology.
C. Learn effectively - use academics effectively.
D. Demonstrate cooperative/teamwork skills.
E. Apply safety.
F. Think critically and creatively.
G. Demonstrate responsible work ethics.
Program Outcomes
A. Learn and apply safe work habits in the classroom and laboratory.
B. Learn and apply basic knowledge of the use and care of hand and power tools related to this field.
C. Maintain 90% or better attendance.
D. Demonstrate professional and quality workmanship in the classroom and laboratory assignments.
E. Apply essential math skills for all areas in building trades.

<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHC105</td>
<td>Introductory Craft Skills</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>IND109</td>
<td>OSHA 30 Hour Construction Ind Cert</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT117</td>
<td>Carpentry I</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>MAT101</td>
<td>Technical Math I</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT122</td>
<td>Floors, Walls &amp; Ceiling Framing</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT127</td>
<td>Windows, Doors, &amp; Stairs</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT137</td>
<td>Roof Framing</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT142</td>
<td>Masonry</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>IND115</td>
<td>Arc Flash</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT132</td>
<td>Drywall</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT212</td>
<td>Carpentry II</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT217</td>
<td>Construction Electricity</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT222</td>
<td>Plumbing</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT227</td>
<td>HVAC</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>BDT232</td>
<td>HVAC Lab</td>
<td>4</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Program Course Descriptions

CHC105 Introductory Craft Skills (3 credits)
Introductory Craft Skills is required for all students entering the Carpentry program. The intent if this course is to introduce the students to the construction trades. It is very important for every student to learn the proper way to conduct themselves while in the shop or on-the-job site. This course will cover shop and job site safety, tool safety, personal protective devices, protective railings, proper storage and handling of construction materials, and construction drawings. This course will follow the NCCER modules for: Basic Safety, Introduction to Construction Math, Introduction to Hand Tools, Introduction to Power Tools, Introduction to Blueprints, Basic Rigging, Basic Communication Skills, and Basic Employability Skills.

IND109 OSHA 30 Hour Construction Industry Certification (2 credits)
Students will learn basic OSHA regulations and safety. The students will also learn how to read the OSHA manual properly. The course will stress the importance of personal protective equipment; fall protection, hazard recognition and other topics connect to on the job site safety. The course will also provide the student with an understanding of current safety regulation, established safety practices, and the impact of behavior and environment on injury prevention.
BDT117 Carpentry I (4 credits)
The intent of this course is to teach the students the history of the construction trade, building materials, different fasteners and adhesives, hand and power tools and reading plans and elevations. It also describes the apprentice program and career opportunities. The course will follow the NCCER modules for: Orientation to the Trade, Building Materials, Fasteners and Adhesives, Hand and Power Tools, and Reading Plans and Elevations.

MAT101 Technical Math I (3 credits)
This course will enable the student to gain confidence with the use of basic math, measurements, and signed numbers. The concepts learned in this course will build problem solving skills that are critical in the workplace. These concepts develop a solid foundation for success in the use of technology.

BDT122 Floors, Walls & Ceiling Framing (4 credits)
This course will cover laying out and erecting floor and wall and ceiling sections. The emphasis for this course is the understanding of precise layout of studs, sills, floor joist, and ceiling members. The student will learn how to layout partitions, door, and window openings. The student will perform the entire layout mentioned above, and know the correct symbols and names of all wall, floor, and ceiling components. The student will be introduced to the different methods used for framing buildings and floor framing with an emphasis on the platform, Balloon and post and beam framing method. The tools and materials used for this type of construction will be covered. The course will follow the NCCER modules for: Floor Systems, Wall and Ceiling Framing, and Introduction to Concrete, Reinforcing Materials and Forms.

BDT127 Windows, Doors & Stairs (3 credits)
This course will introduce the student to methods and procedures used in the selection and installation of residential windows, doors, and stairs. Students will learn the proper components of windows and doors along with basic stair layout. This course will follow the NCCER modules for Windows and Exterior doors and Basic Stair Layout.

BDT137 Roof Framing (3 credits)
Students will learn the different types of roofs used in residential and commercial construction. This course is the most demanding of the framing tasks. Unlike floor and wall construction that involve working with straight lines, roofs are sloped requiring the framer to understand and calculate precise angles. The student will learn the names of all the roof parts and how to calculate the angles to achieve a properly constructed roof. This course will follow the NCCER modules for roof framing.

BDT142 Masonry (3 credits)
This course introduces the student to the fundamentals of masonry work. The student will have the opportunity to gain practical knowledge of masonry as a trade, develop skills in the use of the tools, equipment, materials, and techniques used in masonry.

IND115 Arc Flash (1 credits)
This course will address real world challenges that electrical workers face on a daily basis. It will introduce avoiding oversights that could result in shock and arc-flash accidents. The material presented will emphasize the rules specified by the National Fire Protection Association (NFPA) using the NFPA 70E standards. The delivery method will include videos of real accidents due to arc flash in the manufacturing environment. It will cover first-time coverage of direct current (DC)
shock protection boundaries, hazard and risk categories for specific electrical tasks such as full-head protection against arc flash by eliminating the second task designation protocol stated by the NFPA. After taking this course, students will be able to take the arc flash certification test.

**BDT132 Drywall (3 credits)**
The course introduces the student to the materials and techniques used in building and finishing residential and commercial buildings, including wood and steel framed structures. The course describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. The materials, tools and methods used to finish, and patch gypsum drywall are also covered.

**BDT212 Carpenter II (4 credits)**
Students will learn the techniques of framing and finishing. The students will have the opportunity to become familiar with roofing application, thermal and moisture protection, exterior finishing, commercial drawings, and cold-formed steel framing. This will follow the NCCER modules for Carpenter Level Two.

**BDT217 Construction Electricity (3 credits)**
This course introduces the students to the electrical field. It also provides the student with an opportunity to understand the connection between the two construction fields. The student will be introduced to series, parallel, series-parallel circuits, hardware and systems used by electricians. It also provides a navigational road map for use of the National Electrical Code.

**BDT222 Plumbing (4 credits)**
The course will familiarize the student with the terminology and basic plumbing principles used in the plumbing profession. A variety of topics will be present such as safety, tools, drawings, fittings, fixtures, and faucets. This course will follow the NCCER modules for Plumbing Level One.

**BDT227 HVAC (4 credits)**
The student will learn the basic functions of various Heat Pump design as well as charging and troubleshooting procedures.

**BDT232 HVAC Lab (4 credits)**
This HVAC Lab provides hands-on experience to identify major components and functions of air conditioning systems. Instruction is given on types of air conditioning systems and use of instrumentation. Lab topics include use of AC systems, heat-load calculation, properties of air, duct design, air filtration, and safety principles.

**ADA Notification Statement and Disability Services:**
The Testing/ADA Coordinator office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Tech for persons with disabilities. Qualified students with disabilities MUST register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin by contacting the Testing/ADA Coordinator’s office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of services. Testing/ADA Coordinator coordinates
and assists in arranging services it deems appropriate for eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Testing/ADA Coordinator Phone: 785-228-6356
E-Mail: ssscoordinator@washburn.edu