

CONSTRUCTION TRADES I

Construction Technology I focuses on classroom and laboratory experiences involving the formation, installation, maintenance, and repair of buildings, homes, and other structures. A history of construction, with an emphasis on future trends and career options will also be covered. This course provides instruction in reading technical drawings and transforming those drawings into physical structures. The relationship of views and details, interpretation of dimension, transposing scale, tolerance, electrical symbols, sections, materials list, architectural plans, geometric construction, three dimensional drawing techniques, and sketching will be presented as well as elementary aspects of residential design and site work. Areas of emphasis will include print reading and drawing, room schedules and plot plans. Students will examine the design and construction of floor and wall systems and develop layout and floor construction skills. Blueprints and other professional planning documents will also be covered. Instruction will be given in the following areas, administrative requirements, definitions, building planning, foundations, wall coverings, roof/ceiling construction, and roof assemblies. Students will develop an understanding and interpretation of the Indiana Residential Code for one and two-family dwellings and safety practices including Occupational Safety and Health Administration's Safety & Health Standards for the construction industry.

- DOE Code: 5580
- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Introduction to Construction
- Credits: 2-3 credits per semesters, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit:
 - Ivy Tech
 - CONT 101 – Introduction to Construction
 - CONT 106 – Construction Blueprint Reading
 - BCOT 104 – Floor and Wall Layout
 - Vincennes University
 - CNST 120 – Construction Safety
 - CNST 261 – Indiana Residential Code for One- and Two-Family Dwellings
 - ARCH 102 – Architectural Drafting/Print Reading

Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

Application of Content and Multiple Hour Offerings

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

Content Standards

Domain – Safety

Core Standard 1 Students integrate basic shop and workplace safety concepts into classroom activities and projects.

Standards

- CTI-1.1 Demonstrate safe practices and procedures with power and hand tools
- CTI-1.2 Demonstrate an understanding of basic shop and workplace safety in compliance with OSHA standards
- CTI-1.3 Perform basic first aid procedures
- CTI-1.4 Interpret health, safety, and welfare standards as dictated by local, state, or federal agencies, in relation to shop/work site safety

Domain – Tools

Core Standard 2 Students utilize the appropriate hand, power, and stationary tools to complete various components of a building project.

Standards

- CTI-2.1 Use basic construction hand tools
- CTI-2.2 Demonstrate the proper use of portable power tools
- CTI-2.3 Demonstrate the proper set-up and use of stationary power tools
- CTI-2.4 Set up and properly use levels and transits

Domain – Plans, Specifications, and Codes

Core Standard 3 Students interpret data from plans, specifications and codes to construct various structures.

Standards

- CTI-3.1 Interpret plans, specifications, codes, and welfare standards as dictated by local, state, or federal agencies
- CTI-3.2 Apply the use of construction tools in the creation of a lab project built to plans or specifications
- CTI-3.3 Identify the types of architectural lines, symbols, notations, and abbreviations used in print reading
- CTI-3.4 Evaluate technical problems and information in relation to appropriate project levels

Domain – Construction Blueprint Reading

Core Standard 4 Students interpret residential and light commercial construction blueprints to construct structures.

Standards

- CTI-4.1 Interpret health, safety, and welfare standards as dictated by local, state, or federal agencies

- CTI-4.2 Identify the types of architectural lines, symbols, notations, and abbreviations used in print reading
- CTI-4.3 Identify types of drawings such as elevation views, section views, detail views, and construction materials
- CTI-4.4 Verify the ability to understand and explain building specifications, define dimensioning standards, and the ability to read various scales used in print reading
- CTI-4.5 Apply and adapt knowledge and skills in reading blueprints for structural information
- CTI-4.6 Apply and adapt the knowledge and skills in reading various plot plans, and reading blueprints for various trade information
- CTI-4.7 Apply and adapt systems concepts and knowledge to residential and light commercial technologies

Domain – Floor and Wall Layout Construction

Core Standard 5 Students evaluate quantities and strength of concrete and masonry materials to perform floor and wall installations.

Standards

- CTI-5.1 Create openings for access and equipment to pass through in foundation walls and basement walls
- CTI-5.2 Choose the proper tools for pouring and finishing concrete flatwork
- CTI-5.3 Establish proper foundation corners for a structure based on blueprints and use those corners to install walls

Core Standard 6 Students construct floor framing as dictated by local, state, or federal regulation.

Standards

- CTI-6.1 Select the proper tools and material for layout in construction of a floor system
- CTI-6.2 Apply and adapt methods used in laying out floor framing systems
- CTI-6.3 Apply and adapt knowledge of floor framing systems by listing all required components and describing their functions
- CTI-6.4 Describe the sub-assemblies, which make up the floor layout
- CTI-6.5 Create a floor system in accordance with proper construction procedures and practices

Core Standard 7 Students construct wall framing as dictated by local, state, or federal regulation.

Standards

- CTI-7.1 Select the proper tools and material for layout in construction of a wall system
- CTI-7.2 Apply and adapt methods used in laying out wall framing systems
- CTI-7.3 Apply and adapt knowledge of wall framing systems by listing all required components and describing their functions
- CTI-7.4 Describe the sub-assemblies, which make up the wall layout
- CTI-7.5 Create a wall system in accordance with proper construction procedures and practices

Core Standard 8 Students apply concepts and basic skills in practical residential construction projects to layout a stairway.

Standards

- CTI-8.1 Design and layout a stairway using the framing square and match applicable to stair construction

- CTI-8.2 Practice safety habits- as required by the trade and OSHA- at all times
- CTI-8.3 Apply and adapt new building technology skills and knowledge in the workplace in reasoning, reading, writing, and mathematics with knowledge in construction principle's and concepts
- CTI-8.4 Apply and adapt knowledge of building structure, materials, and methods of construction. Read blueprints, interpret drawings, understand specifications, and work within tolerance
- CTI-8.5 Find, read and interpret technical manuals, specifications, prints, diagrams, charts, codes, architectural data, and architectural drawings
- CTI-8.6 Interpret health, safety, and welfare standards as dictated by local, state, or federal agencies

Core Standard 9 Students establish communication skills to properly identify ideas and concepts in floor and wall layout construction.

Standards

- CTI-9.1 Communicate verbally with others clearly, concisely, and convincingly