

# CONSTRUCTION CARPENTRY TECHNOLOGY

Program of Studies  
2015-2016

## TRACK ONLY



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## CARPENTRY

Course Title	Post-Secondary Connection	Valid Course Code	Recommended Grade Level				Recommended Credit
			9	10	11	12	
Cabinet Construction and Installation	CAR 240/241	460209		X	X	X	1
<b>Ceiling and Roof Framing</b>	CAR 196/197	<a href="#">460213</a>	X	X	X	X	1
Construction Forms	CAR 150/151	460218		X	X	X	1
Construction Prints	BRX 220	460217		X	X	X	.5
Co-op (Carpentry)	CAR 299	460242			X	X	1
Exterior and Interior Finish	CAR 200/201	460219		X	X	X	1
<b>Floor and Wall Framing</b>	CAR 190/191	<a href="#">460212</a>	X	X	X	X	1
Industrial Safety	ISX 100	499930	X	X	X	X	.5
<b>Introduction to Construction Technology</b>	CAR 126/127	<a href="#">460201</a>	X	X	X	X	1
Internship (Carpentry)		460245			X	X	1
<b>Site Layout and Foundations</b>	CAR 140/141	<a href="#">460214</a>		X	X	X	1

# CONSTRUCTION CARPENTRY TECHNOLOGY

## Program Description

The Construction Carpentry Technology program will prepare students for a meaningful career in residential and commercial construction. Program completion may lead to placement in an apprenticeship program and/or admission to a postsecondary program. Students will have the opportunity to train at construction sites through work-based learning and student projects. Current and traditional building practices, which meet industry standards, include energy efficient construction, health and safety at the workplace, and maintenance of existing structures.

Students will learn the safe and proper use of tools, equipment, and techniques used in the construction industry. Formative and summative assessments will be used to determine student proficiency in hand and power tool operation. Instruction will include proper procedures for constructing residential and commercial projects. Students will complete hands-on projects starting from construction prints to completion.

Course offerings promote career opportunities for those entering the industry. There are multiple options available for program completers which may include apprentice, journeyman carpenter, foreman, and engineer or project manager with additional post-secondary course work. Articulation agreements with post-secondary institutions are available for college credit during or after program completion. Advanced placement is available through the Indiana Kentucky Ohio Regional Council of Carpenters Joint Apprenticeship and Training Fund (IKORCCJATF) apprenticeship program. Students completing the journeyman level of the IKORCCJATF apprenticeship program will obtain an associate's degree from an approved college or university.

The Construction Carpentry Program prepares students for high-skill, high-wage, and high-demand careers.

**CONSTRUCTION CARPENTRY TECHNOLOGY  
CAREER PATHWAYS  
2015-2016**

**CARPENTRY -- TRACK  
CIP 46.0201.99**

**PATHWAY DESCRIPTION:** A program that prepares individuals to apply technical knowledge and skills to lay out, cut, fabricate, erect, install, and repair wooden structures and fixtures, using hand and power tools. Includes instruction in technical mathematics, framing, construction materials and selection, job estimating, blueprint reading, foundations and roughing-in, finish carpentry techniques, and applicable codes and standard. Each student must pass an End of Program assessment and complete 8 OSHA Safety modules listed on the “Track” website (<http://www.laborcabinettrain.ky.gov/track.html>) to be eligible to receive credit and preference in an organization that sponsors a registered apprenticeship program. Course credit will be considered at the discretion of training provider (grades and attendance can be taken into consideration).

**BEST PRACTICE CORE**

**EXAMPLE  
ILP-RELATED  
CAREER TITLES**

*Foundational Skills Necessary for Career-Ready Measure:  
(KOSSA/Industry Certification)*

*Complete (4) **FOUR CREDITS:***

- [460201](#) Introduction to Construction Technology
- [460212](#) Floor and Wall Framing
- [460213](#) Ceiling and Roof Framing
- [460214](#) Site Layout and Foundations

Carpenter  
Construction  
Tradesperson

The Tech Ready Apprentices for Careers in Kentucky (*TRACK*) pre-apprenticeship program is a partnership between The Kentucky Department of Education’s Office of Career and Technical Education and The Kentucky Labor Cabinet to provide pre-apprenticeship career pathway opportunities into registered apprenticeship programs to secondary students. This is a business and industry driven program to create a pipeline for students to enter post-secondary apprenticeship training.

Upon successful completion, the student will be awarded an industry certification by the employer or training organization through The Kentucky Labor Cabinet and all on-the-job hours worked will be counted towards the apprenticeship, if applicable. The certification will also count towards the local school district’s college and career ready accountability index.

The specifics of the *TRACK* program vary and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. There are no costs involved except wages for the student employee. The employer must have a registered apprenticeship program with The Kentucky Labor Cabinet. For more information, please refer to: <http://education.ky.gov/CTE/cter/Pages/TRACK.aspx>

As career pathways continue to expand, the ultimate rationale is that if an employer is willing to implement a Registered Apprenticeship program, a pipeline at the secondary level can be developed utilizing the TRACK program.

Course Description	
<p>This course is the introduction to the construction carpentry industry. The class will emphasize safe and proper methods of operating hand tools, portable power tools, and stationary power tools in the construction industry.</p>	
Content/Process	
1	<p><b>Math for the Trades:</b></p> <ul style="list-style-type: none"> <li>a) Add, subtract, multiply, and divide single-, double-, and triple-digit numbers</li> <li>b) Use fractions to add, subtract, multiply, and divide parts of numbers</li> <li>c) Convert fractions to decimals and decimals to fractions, and use decimals to find percentages</li> <li>d) Use and understand how to read measuring tools</li> <li>e) Construct layouts using lines, circles, and angles</li> <li>f) Explain square roots, square numbers, and the Pythagorean Theorem</li> <li>g) Use area measure to find the area of: rectangles, squares, and circles</li> <li>h) Use volume measure to calculate the volume of three-dimensional objects</li> <li>i) Perform mathematics functions as related to tasks being performed</li> <li>j) Identify the actual and nominal sizes of lumber</li> </ul>
2	<p><b>Health and Safety</b></p> <ul style="list-style-type: none"> <li>a) Assume responsibility for safety of self and others</li> <li>b) Identify the proper use of personal protection equipment and general job safety (e.g., eye protection, harnesses, footwear)</li> <li>c) Identify universal safety precaution procedures (e.g., barriers, overhead, guardrails, proper lifting)</li> <li>d) Manage personal health and wellness (e.g., substance abuse, air pollutants, chemicals, workplace toxins)</li> <li>e) Explain the use of hand signals used as communication on a construction site</li> </ul>
3	<p><b>Hand and Power Tools:</b></p> <ul style="list-style-type: none"> <li>a) Identify and use various types of fasteners, anchors, and adhesives used in the construction industry</li> <li>b) Demonstrate the safe and proper use of the following types of hand tools: fastening devices, layout and measuring devices, leveling devices, edge cutting devices, etc.</li> </ul>

	<ul style="list-style-type: none"> <li>c) Demonstrate the safe and proper use of the following types of portable power tools: various saws, surfacing and shaping tools, drills, pneumatic tools, etc.</li> <li>d) Demonstrate the safe and proper use of the following stationary power tools: various saws, drill press, surfacing and shaping tools, drills, pneumatic tools, etc.</li> <li>e) Build a project using tools of the trade: sawhorse, shop bench, tool box, picnic table</li> </ul>	
4	<p><b>Building Layout</b></p> <ul style="list-style-type: none"> <li>a. Identify and use various types of building materials</li> </ul>	
<p>Connections:</p> <ul style="list-style-type: none"> <li>*Common Core State Standards</li> <li>*KOSSA TRACK</li> <li>*Common Core Technical Standards</li> <li>*New Generation Science Standards</li> <li>*Post-Secondary: KCTCS CAR 126/127</li> <li>*CTSO--SkillsUSA</li> </ul>		

# Floor and Wall Framing

460212

Course Description	
<p>The student will practice floor framing, layout, and construction of floor frames. Cutting and installing floor and wall framing members according to plans and specifications will also be practiced.</p>	
Content/Process	
1	<p><b>Math for the Trades:</b></p> <ul style="list-style-type: none"> <li>a) Add, subtract, multiply, and divide single-, double-, and triple-digit numbers</li> <li>b) Use fractions to add, subtract, multiply, and divide parts of numbers</li> <li>c) Convert fractions to decimals and decimals to fractions, and use decimals to find percentages</li> <li>d) Use and understand how to read measuring tools</li> <li>e) Construct layouts using lines, circles, and angles</li> <li>f) Explain square roots, square numbers, and the Pythagorean Theorem</li> <li>g) Use area measure to find the area of: rectangles, squares, and circles</li> <li>h) Use volume measure to calculate the volume of three-dimensional objects</li> <li>i) Perform mathematics functions as related to tasks being performed</li> <li>j) Identify the actual and nominal sizes of lumber</li> </ul>
2	<p><b>Health and Safety</b></p> <ul style="list-style-type: none"> <li>a) Assume responsibility for safety of self and others</li> <li>b) Identify the proper use of personal protection equipment and general job safety (e.g., eye protection, harnesses, footwear)</li> <li>c) Identify universal safety precaution procedures (e.g., barriers, overhead, guardrails, proper lifting)</li> <li>d) Manage personal health and wellness (e.g., substance abuse, air pollutants, chemicals, workplace toxins)</li> <li>e) Explain the use of hand signals used as communication on a construction site</li> </ul>
3	<p><b>Metal Framing:</b></p> <ul style="list-style-type: none"> <li>a) Understand the background, advantages, and applications of metal framing (e.g., cost savings, workability, varied sizes and shapes, ease of operation, fire resistance, and sound transmission)</li> <li>b) Identify metal framing components and their sizes; gauges of metal; types and shapes of beams, columns, and pilasters;</li> </ul>

	<p>and various trims and fasteners used for interior partition work</p> <p>c) Read prints and specifications to determine the type of partition and its location, layout, and related requirements</p> <p>d) Identify, estimate and describe installation of ceiling and wall covering (e.g., suspended ceiling, drywall, paneling)</p>	
4	<p><b>Wood Framing:</b></p> <p>a) Building Layout</p> <p>b) Install sill plates to foundation walls</p> <p>c) Install support beams</p> <p>d) Frame built-up girders</p> <p>e) Install Lally posts</p> <p>f) Install floor joists</p> <p>g) Frame floor openings</p> <p>h) Lay subfloors and underlayment</p> <p>i) Calculate layout, cut, and install stairs</p> <p>j) Construct, layout, and install exterior walls</p> <p>k) Frame wall openings</p> <p>l) Install exterior wall sheathing</p> <p>m) Layout, construct, install, and frame partition walls using wood and steel studs</p> <p>n) Frame special partitions (i.e. late blueprint changes)</p> <p>o) Install house wrap</p>	
<p>Connections:</p> <p>*Common Core State Standards</p> <p>*KOSSA TRACK</p> <p>*Common Core Technical Standards</p> <p>*New Generation Science Standards</p> <p>*Post-Secondary: KCTCS CAR 190/191</p> <p>*CTSO--SkillsUSA</p>		

## Ceiling and Roof Framing

460213

Course Description	
<p>This course covers roof types and combinations of roof types used in the construction industry. The emphasis of this course is on layout, cutting and installing ceiling joists, rafters, roof sheathing, and roof coverings for both commercial and residential construction.</p>	
Content/Process	
1	<p><b>Math for the Trades:</b></p> <ul style="list-style-type: none"> <li>a) Add, subtract, multiply, and divide single-, double-, and triple-digit numbers</li> <li>b) Use fractions to add, subtract, multiply, and divide parts of numbers</li> <li>c) Convert fractions to decimals and decimals to fractions, and use decimals to find percentages</li> <li>d) Use and understand how to read measuring tools</li> <li>e) Construct layouts using lines, circles, and angles</li> <li>f) Explain square roots, square numbers, and the Pythagorean Theorem</li> <li>g) Use area measure to find the area of: rectangles, squares, and circles</li> <li>h) Use volume measure to calculate the volume of three-dimensional objects</li> <li>i) Perform mathematics functions as related to tasks being performed</li> <li>j) Identify the actual and nominal sizes of lumber</li> </ul>
2	<p><b>Health and Safety:</b></p> <ul style="list-style-type: none"> <li>a) Assume responsibility for safety of self and others</li> <li>b) Identify the proper use of personal protection equipment and general job safety (e.g., eye protection, harnesses, footwear)</li> <li>c) Identify universal safety precaution procedures (e.g., barriers, overhead, guardrails, proper lifting)</li> <li>d) Manage personal health and wellness (e.g., substance abuse, air pollutants, chemicals, workplace toxins)</li> <li>e) Explain the use of hand signals used as communication on a construction site</li> <li>f) Identify and understand safe rigging practices</li> </ul>
3	<p><b>Metal Framing:</b></p> <ul style="list-style-type: none"> <li>a) Understand the background, advantages, and applications of metal framing (e.g., cost savings, workability, varied sizes and shapes, ease of operation, fire resistance, and sound transmission)</li> </ul>

	<ul style="list-style-type: none"> <li>b) Identify metal framing components and their sizes; gauges of metal; types and shapes of beams, columns, and pilasters; and various trims and fasteners used for interior partition work</li> <li>c) Read prints and specifications to determine the type of partition and its location, layout, and related requirements</li> <li>d) Identify, estimate and describe installation of ceiling and wall covering (e.g., suspended ceiling, drywall, paneling)</li> </ul>	
4	<p><b>Hand and Power Tools:</b></p> <ul style="list-style-type: none"> <li>a) Identify and demonstrate the safe and proper use of hand tools (e.g., fastening devices, leveling devices, edge cutting devices)</li> <li>b) Identify and demonstrate the safe and proper use of power tools (e.g., electric portable and stationary, powder-actuated, pneumatic)</li> </ul>	
5	<p><b>Wood Framing:</b></p> <ul style="list-style-type: none"> <li>a) Plan a roof system</li> <li>b) Calculate, layout, cut and erect rafters to build a gable roof</li> <li>c) Calculate, layout, cut and erect rafters to build a hip roof and/or other type of roofs</li> <li>d) Cut and install jack rafters</li> <li>e) Cut and install ceiling joists</li> <li>f) Install purlins, collar ties, and knee walls</li> <li>g) Frame roof openings and roof saddles</li> <li>h) Frame dormers</li> <li>i) Install roof sheathing</li> <li>j) Install roof underlayment</li> <li>k) Install roof flashing and drip edge</li> <li>l) Install various types of roof coverings</li> <li>m) Install various types of attic vents</li> <li>n) Install prefabricated trusses</li> <li>o) Cut, construct, and install trusses</li> </ul>	
<p>Connections:  *Common Core State Standards  *KOSSA TRACK  *Common Core Technical Standards  *New Generation Science Standards  *Post-Secondary: KCTCS CAR 196/197  *CTSO--SkillsUSA</p>		

## Site Layout and Foundations

460214

Course Description		
<p>Students will prepare materials, calculate the cost for a building site, and layout a site with a transit, locating property lines and corners. Students calculate the amount of concrete needed for footing and foundation walls and construct different types of foundations and forms</p>		
Content/Process		
1	<p><b>Math for the Trades:</b></p> <ul style="list-style-type: none"> <li>a) Add, subtract, multiply, and divide single-, double-, and triple-digit numbers</li> <li>b) Use fractions to add, subtract, multiply, and divide parts of numbers</li> <li>c) Convert fractions to decimals and decimals to fractions, and use decimals to find percentages</li> <li>d) Use and understand how to read measuring tools</li> <li>e) Construct layouts using lines, circles, and angles</li> <li>f) Explain square roots, square numbers, and the Pythagorean Theorem</li> <li>g) Use area measure to find the area of: rectangles, squares, and circles</li> <li>h) Use volume measure to calculate the volume of three-dimensional objects</li> <li>i) Perform mathematics functions as related to tasks being performed</li> <li>j) Identify the actual and nominal sizes of lumber</li> </ul>	
2	<p><b>Health and Safety</b></p> <ul style="list-style-type: none"> <li>a) Assume responsibility for safety of self and others</li> <li>b) Identify the proper use of personal protection equipment and general job safety (e.g., eye protection, harnesses, footwear)</li> <li>c) Identify universal safety precaution procedures (e.g., barriers, overhead, guardrails, proper lifting)</li> <li>d) Manage personal health and wellness (e.g., substance abuse, air pollutants, chemicals, workplace toxins)</li> <li>e) Explain the use of hand signals used as communication on a construction site</li> </ul>	
3	<p><b>Building Layout:</b></p> <ul style="list-style-type: none"> <li>a) Explain safety procedures associated with site layout and foundations</li> <li>b) Describe building site leveling/layout instruments (ex.</li> </ul>	

	<p>transit, total station)</p> <ul style="list-style-type: none"> <li>c) Identify and read relevant sections of the building plan</li> <li>d) Identify tools and materials required in the building layout process</li> <li>e) Identify the leveling and layout equipment (e.g., builders level, transit, tape lines)</li> <li>f) Demonstrate an ability to keep and interpret notes in a field book (e.g., elevation, distance, triangulation)</li> </ul>	
4	<p><b>Formwork:</b></p> <ul style="list-style-type: none"> <li>a) Discuss basic properties of concrete</li> <li>b) Identify different soil conditions and the effects on footing design</li> <li>c) Name important structural components that can be fabricated from formwork and concrete</li> <li>d) Describe and/or build various types of foundation systems</li> <li>e) Calculate the quantity of concrete blocks and common face brick needed for a concrete block wall</li> <li>f) Calculate the amount of concrete needed for footings and foundation walls</li> </ul>	
5	<p><b>Piers, Columns, Pile caps:</b></p> <ul style="list-style-type: none"> <li>a) Explain &amp; build the construction of piles, piers, &amp; columns</li> <li>b) Differentiate between proper and improper components and design of piers, columns, pile caps, and pier caps</li> <li>c) Solve equations commonly used in designing and estimating piers, columns, and caps</li> </ul>	
<p>Connections:  *Common Core State Standards  *KOSSA TRACK  *Common Core Technical Standards  *New Generation Science Standards  *Post-Secondary: KCTCS CAR 140/141  *CTSO—Skills USA</p>		