

STRUCTURAL SYSTEMS

Program of Study

COLLEGE, CAREER, AND TECHNICAL EDUCATION

- Trade and Industry
 - Architecture and Construction Career Cluster
 - Structural Systems Program of Study

TRADE AND INDUSTRIAL EDUCATION

- **Trade and Industrial Education** helps prepare students for an increasingly demanding high skilled workplace in the United States.

TRADE AND INDUSTRIAL EDUCATION

- To meet the needs of the technologically changing workplace, the state curriculum has recently been aligned with industry standards, and teachers are often offered professional development opportunities to upgrade their skills to the levels required for instruction according to industry standards.

TRADE AND INDUSTRIAL EDUCATION

- **Trade and Industrial Education:**
 - Combines theory with application to develop technical skills, occupational judgments, and workplace ethics.
 - The courses are closely aligned with those of postsecondary institutions in Tennessee, allowing students to make easier transitions to those state schools.

TRADE AND INDUSTRIAL EDUCATION

- **Trade and Industrial Education:**
 - Offers high quality educational experiences to promote teamwork, leadership, high work standards, and help develop a value for lifelong learning.

TRADE AND INDUSTRIAL EDUCATION

- Classes in Trade and Industrial Education require students to develop manipulative skills, safety skills, job judgment, and technical knowledge.
- Most of the courses now rely on computer software, and there is a greater use of technology current course competencies.
- The program offers six specialized career clusters and programs of study.

ARCHITECTURE AND CONSTRUCTION

- Programs of Study:
 - Residential & Commercial Construction
 - **Structural Systems**
 - Mechanical, Electrical, & Plumbing (MEP) Systems
 - Architectural & Engineering Design
 - Interior Design

STRUCTURAL SYSTEMS



PROGRAM OF STUDY

- The Structural Systems program of study prepares students with the knowledge and skills related to residential and commercial carpentry.
- Course content covers wood, metal, and concrete building materials, fasteners, hand and power tools, fabrication based on construction plans, framing of platform and post-and-beam structures, stairs, structural loads, installation and trim of windows and doors, installation and repair of gypsum wallboard, exterior finish work, cabinet installation, and thermal and moisture protection.

PROGRAM OF STUDY

- The fourth level course, *Construction Practicum*, places students with industry partners to complete a capstone construction project.
- Upon completion of the program of study, students will be equipped for workforce entry, apprenticeships, or to continue training at the postsecondary level.

High School Structural Systems Program of Study

Industry Certification

- NCCER Core Curriculum
- NCCER Carpentry

CTSO Competitive Events

- SkillsUSA

Work-based Learning: Career Practicum

Apprenticeship

Apprenticeship training is available in carpentry and other related areas.

Certificate

Building Construction Technology

- TCAT Crossville
- TCAT Livingston
- TCAT Memphis
- TCAT Nashville
- TCAT Pulaski

Construction Applications

- Cleveland State

Masonry

- TCAT Memphis
- TCAT Morristown

Residential Building Maintenance

- TCAT Paris

Associates

Civil Technology

- Cleveland State

Bachelors

Construction Management

- MTSU
- University of Tennessee at Chattanooga

Construction Science

- University of Tennessee at Knoxville

Concrete Industry Management

- MTSU

Architecture & Engineering

- Available at many TN universities

Career Opportunities

High School Diploma

- Painters, construction and maintenance, \$30,900
- General maintenance and repair workers, \$36,170
- Cement masons and concrete finishers, \$31,820
- Roofers, \$32,540
- Construction laborers, \$27,530
- Drywall and ceiling tile installers, and tapers, \$33,990
- Insulation workers, floor, ceiling, and wall \$30,360
- Operating engineers and equipment operators, \$36,170

Apprenticeship

- Carpenters, \$34,080
- Brickmasons and blockmasons, \$34,160
- Structural iron and steel workers, \$40,810
- First-line supervisors of construction trades and extraction workers, \$50,350

Certificate

- Carpenters, \$34,080
- Brickmasons and blockmasons, \$34,160

Associates

- Civil engineering technicians, \$49,920

Bachelors

- Construction managers, \$76,040
- Cost estimators, \$55,330
- Civil engineers, \$89,140
- Surveyors, \$44,940

NCCER

Industry Certification



National Center for Construction Education and Research

NCCER



- NCCER is a not-for-profit 501(c)(3) education foundation created in 1996 as The National Center for Construction Education and Research.
- It was developed with the support of more than 125 construction CEOs and various association and academic leaders who united to revolutionize training for the construction industry.

NCCER



- Sharing the common goal of developing a safe and productive workforce, these companies created a standardized training and credentialing program for the industry.
- This progressive program has evolved into curricula for more than 70 craft areas and a complete series of more than 70 assessments offered in over 4,000 NCCER-accredited training and assessment locations across the United States.

NCCER



- NCCER develops standardized construction and maintenance curricula and assessments with portable credentials.
- These credentials are tracked through NCCER's National Registry which allows organizations and companies to track the qualifications of their craft professionals and/or check the qualifications of possible new hires.
- The National Registry also assists craft professionals by maintaining their records in a secure database.

NCCER



- NCCER's workforce development process of accreditation, instructor certification, standardized curriculum, national registry, assessment, and certification is a key component in the industry's workforce development efforts.
- NCCER also drives multiple initiatives to enhance career development and recruitment efforts for the industry.

NCCER



- NCCER's new branding and international initiatives have led to the use of NCCER in lieu of The National Center for Construction Education and Research.
- The same great resources and services are still available.

NCCER



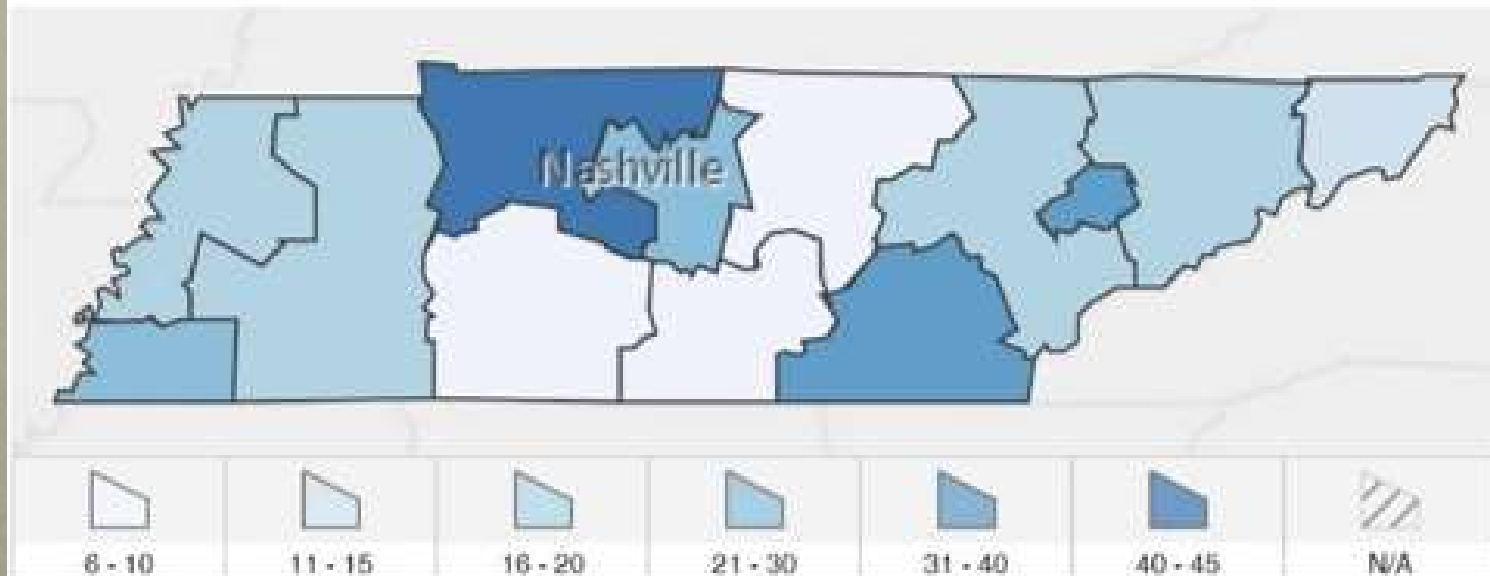
- NCCER is headquartered in Alachua, Fla., and is affiliated with the University of Florida's M.E. Rinker, Sr. School of Building Construction.

CAREER OPPORTUNITIES

- Employment for carpenters is projected to grow by 5 percent in Tennessee between 2014 and 2022 with a total annual average of 200 openings.
- Skills students develop in the program of study are transferrable to additional growing occupations related to structural systems listed in the chart to the right.
- Opportunities are available in a range of occupations including supervisory roles such as construction manager or first-line supervisor.
- Job outlook is positive in all regions of the state; however, more opportunities are available in urban and surrounding areas.

CAREER OPPORTUNITIES

Annual Average Openings for Carpenters in Tennessee (2014-2022)



Source: TN Department of Labor and Workforce Development. (2015).
Employment Security Division, Labor Market Information Section, on the
internet at <https://www.jobs4tn.gov/> (visited Feb. 10, 2016)

CAREER OPPORTUNITIES

Structural Systems Related Occupations with the Most Annual Average Openings in Tennessee (2014-2022)

Occupation	Total Percent Change	Annual Avg. Openings
Maintenance & Repair Workers, General	7.7%	880
Construction Laborers	12.9%	840
Construction Managers	4.6%	235
Civil Engineers	17.6%	215
Supervisors of Construction & Extraction Workers	9.2%	210
Carpenters	5.0%	200
Operating Engineers & Other Construction Equipment Operators	14.3%	185
Cost Estimators	11.9%	170
Sheet Metal Workers	14.4%	160
Roofers	19.0%	115
Cement Masons & Concrete Finishers	23.1%	90
Painters, Construction & Maintenance	4.5%	90
Brick masons & Block masons	38.9%	60
Construction & Building Inspectors	9.8%	55

POSTSECONDARY OPTIONS



Have you registered for the Tennessee Promise? Seniors enrolled in this program have the chance to attend a two-year program at a Tennessee College of Applied Technology (TCAT), community

community college, or some 2-year university programs for free! To learn more, please see your school counselor or visit <http://www.tennesseepromise.gov>.

School	Degree Program
TCAT Nashville	Building Construction Technology
TCAT Crossville	Building Construction Technology
Cleveland State	Surveying
TCAT Paris	Residential Building Maintenance
Chattanooga State	Construction Management (concentration)
Chattanooga State	Construction Engineering Technology

For more college and career planning resources, visit <http://collegefortn.org>.

Students in this program of study will be eligible to join SkillsUSA. In addition to school events, students will be able to compete at the regional, state, and national level. Through SkillsUSA, students not only learn about construction, but also professionalism, leadership, and workplace skills. Walk away from your high school career with experience in competing, networking, applying course content, and more!

See your teacher to learn more about SkillsUSA or visit

<http://tnskillsusa.com/>.

