Syracuse City School District
Career and Technical Education Program
Construction Technology Pathway
Summary Overview

Pathway Overview

At the completion of the Construction Technology program, students will be able to apply the trade skills necessary for entry-level employment, apprenticeships, and post-secondary education. Students will study and practice safety training, framing, roofing, door and window installation, hand and power tool use, concrete, masonry and bricklaying, blueprint reading, plumbing, electrical, and construction equipment and rigging. Students will learn the theory of the construction process and have the opportunity to put those theories into practice with authentic, hands-on, project-based activities. Students will also have the opportunity to earn the MC3 (NABTU Trades Futures Multi-Craft Core Curriculum) as well as the OSHA 10 certifications, recognized throughout the construction industry as indicators that the individual is job ready.

Calendar for Pathway

Level	Quarter	Units of Study
100 9th Grade	**1**	• Basic Safety • OSHA 10 Certification • Safety Projects • Communication Skills • Employability Skills • Work-Based Learning: Career Coaching, Field Trip
	2	• Construction Math • Construction Math Project: Roofing • Hand Tools and Safety • Hand Tool Project • Work-Based Learning: Career Coaching
	3	• Power Tools and Safety • Power Tool Projects • Construction Drawings • Construction Drawing Project • Work-Based Learning: Career Coaching, Field Trip
	4	• Basic Construction Equipment Rigging • Construction Materials Processing and Handling • Materials Rigging and Handling Project • Communication and Employability Skills • OSHA 10 Certification • Work-Based Learning: Career Coaching
200 10th Grade	**1**	• Introduction to Concrete Work: Tools, Equipment and Safety • OSHA Safety Review • Review of Construction Math • Introduction to Concrete Construction and Finishes • Site Layouts • Work-Based Learning: Career Coaching, Job Shadow
	2	• Forming Concrete • Placing Concrete • Work-Based Learning: Career Coaching, Job Shadow
	3	• Introduction to Masonry • Introduction to Carpentry Floor Systems • Work-Based Learning: Career Coaching, Job Shadow
	4	• Wall Systems • Roof Systems • Work-Based Learning: Career Coaching, Job Shadow • Final Assessment

Level	Quarter	Units of Study
300 11th Grade	**1**	• Introduction to the Plumbing Profession • OSHA Safety Review • Review of Construction Math • Plumbing Safety • Tools and Equipment of the Plumbing Trade • Plastic Pipe and Fittings • Work-Based Learning: Career Coaching, Job Shadow
	2	• Copper Pipe and Fittings • Introduction to the Electrical Trades • Electrical Safety • Introduction to Electrical Circuits • Work-Based Learning: Career Coaching, Job Shadow
	3	• Electrical Theory • Electrical Projects • Introduction to Building Envelope Systems • Work-Based Learning: Career Coaching, Job Shadow
	4	• Green Building Environments • Capstone Project • Work-Based Learning: Career Coaching, Job Shadow
400 12th Grade	**1**	• Course Expectations and Career Preparation • OSHA Safety Review • Site Layout: Differential Leveling • Review of Construction Math • Slab-On-Grade Foundations • Internship and Career Preparation • Work-Based Learning: Career Coaching
	2	• Workplace Communication • Floor Installation and Finishing Project • Stair Layout Projects • Wall Systems and Application Projects • Work-Based Learning: Career Coaching
	3	• Drywall Installation and Finishing • Career Readiness • Roof Framing and Applications Projects • Exterior Finishing Applications • Work-Based Learning: Internship
	4	• Legal and Ethical Practices in the Trades • Final Project Proposals • Project Proposal Resubmissions • Individual Project Work • Portfolios • Project Presentations • Work-Based Learning: Career Coaching

Syracuse City School District
Career and Technical Education Program
Course Syllabus
CNT 100: Construction Technology 100

Pathway Overview

At the completion of the Construction Technology program, students will be able to apply the trade skills necessary for entry-level employment, apprenticeships, and post-secondary education. Students will study and practice safety training, framing, roofing, door and window installation, hand and power tool use, concrete, masonry and bricklaying, blueprint reading, plumbing, electrical, and construction equipment and rigging. Students will learn the theory of the construction process and have the opportunity to put those theories into practice with authentic, hands-on, project-based activities. Students will also have the opportunity to earn the MC3 (NABTU Trades Futures Multi-Craft Core Curriculum) as well as the OSHA 10 certifications, recognized throughout the construction industry as indicators that the individual is job ready.

Course Description

Construction Technology 100 provides basic technical knowledge and safety skills to begin preparing students for a career in the field. Student will learn about the importance of safety and personal protection in all aspects of construction. Students will learn and apply skills in math and measurement for construction, as well as project and materials estimating. Students will identify and safely use hand and power tools and common types of construction rigging for materials handling and processing. Students will learn to read and interpret construction drawings and apply that knowledge to construct projects based on drawings and specifications. Students will also learn about and practice skills for effective communication and customer service.

Work-Based Learning

Students will be connected with construction industry professionals in the community through Career Coaching, field trips and job shadowing, which could lead to further opportunities for direct job training and real-world experience. Students will create and maintain a portfolio of their work-based learning experiences throughout the program to document the development of their skills.

Additional Learning Opportunities

- **Micro-credentials:** Students may pursue learning experiences and credentials depending on the requirements of the projects that they are involved in. Some examples for this pathway include, but are not limited to:
    - OSHA 10 Construction Safety Certification
    - NABTU (North America's Building Trades Unions) Multi-Craft Core Curriculum (MC3)
    - Other relevant certifications as they become available through industry collaborations, teacher certifications and student interest.
- **Summer Bridge Enrichment:** Students will have the opportunity to participate in cross-curricular Summer Bridge programs to enhance and enrich their skills. Students will explore and create solutions that address authentic needs in the school and wider community with the involvement of local industry professionals. Students will build on skills learned during the school year to work collaboratively with students from other pathways and programs.

Pre-Requisites

Entrance Application and Formal Interview
Acceptance into Program

Course Objectives

By the end of this course, students will:

1. Implement key safety procedures while working on a construction site.
2. Safely and accurately use hand and power tools in construction projects.
3. Apply basic math to calculate measurements in construction activities.
4. Read and interpret building plans to access information necessary to complete construction projects.
5. Identify and describe the working properties of materials used on a construction site.
6. Accurately handle and process various construction materials.
7. Qualify for OSHA (Occupational Safety and Health Administration) 10 certification.

Integrated Academics

N/A

Equipment and Supplies

- **School will provide**: All necessary tools, materials, and classroom equipment.
- **Student will provide**: Leather work boots or shoes (steel/composite toe preferred), long work pants with no holes that cover the top of the shoe or boot, notebook for taking and saving notes, pen/pencils.

Resources and References

CITF: Carpenters International Training Fund. *Career Connections Introduction to Millwrighting*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Math for the Trades*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections One Trade, Many Careers*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 1*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 2*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 3*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 4*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

International Code Council. *2021 International Residential Code (International Code Council Series) 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2021.

—. *2024 International Building Code 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2024.

Grading

- Unit Classwork: 30%
- End of Unit Assessment: 30%
- Project Work: 20%
- Participation: 20%

Additional Course Policies

Students are required to follow all classroom professionalism and safety procedures.

Course Calendar

Quarter	Units of Study
1	• Basic Safety • OSHA 10 Certification • Safety Projects • Communication Skills • Employability Skills • Work-Based Learning: Career Coaching, Field Trip
2	• Construction Math • Construction Math Project: Roofing • Hand Tools and Safety • Hand Tool Project • Work-Based Learning: Career Coaching
3	• Power Tools and Safety • Power Tool Projects • Construction Drawings • Construction Drawing Project • Work-Based Learning: Career Coaching, Field Trip
4	• Basic Construction Equipment Rigging • Construction Materials Processing and Handling • Materials Rigging and Handling Project • Communication and Employability Skills • OSHA 10 Certification • Work-Based Learning: Career Coaching

Syracuse City School District
Career and Technical Education Program
Scope and Sequence
CNT100: Construction Trades Technology 100

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Weeks 1-4 **Basic Safety** **OSHA 10 Certification**	• What is the importance of safety in the building and construction trades? • What is the role and responsibility of workers in maintaining a safe work environment? • What is OSHA? • What purpose does OSHA serve in ensuring that workers are safe on a construction site? • What is the function of the EPA? • What is an SDS?	• Describe the importance of compliance with safety standards and explain how it affects overall production in an organization. • Explain the importance of health, safety, and environmental management systems in organizations. • Identify and interpret universal signs and symbols to ensure safety at job sites. • Explain the purpose and function of OSHA. • Review requirements for OSHA 10 Certification. • Explain the function of the EPA. • Describe the purpose and information contained in Safety Data Sheets. • Comply with all safety policies and procedures. • Begin OSHA 10 Certification process.	**Written** • Research Project: Industry Safety Standards and Economic Impacts of Job-Related Accidents and Injuries • Tests and Quizzes • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist	**Career Ready Practices** CRP 1,2,3,4,7,8,10,11 **Cluster Standards** AC 3 **Pathway Standards** AC-CST 5 AC-DES 2 AC-MO 1	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** AI-S.ID.1,2,3,5,6
Week 5 **Safety Projects**	• What are some common construction site hazards? • What steps should be taken in assessing and correcting unsafe working conditions? • How can good communication skills facilitate worker safety?	• Identify the types and sources of workplace hazards common to various construction settings. • Identify universal signs and symbols related to safety precautions. • Apply safety principles to correct identified hazards in a variety of construction related settings. • Communicate potential or actual safety concerns to peers and supervisors.	**Written** • Workplace Hazard Identification • Tests and Quizzes • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Safety Project	**Career Ready Practices** CRP 1,2,3,4,8,11,12 **Cluster Standards** AC 3 **Pathway Standards** AC-CST 5 AC-DES 2 AC-MO 1	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** AI-S.ID.1,2,3,5,6
Weeks 6-7 **Communication Skills**	• Why are written and verbal communication skills important in the construction industry? • What types of written and verbal communication are commonly used at worksites? • What are differences in communication between co-workers and between supervisors and workers?	• Describe effective verbal communication skills necessary for successful employment. • Analyze personal communication style and explore strategies to improve and enhance skills. • Communicate effectively both verbally and in writing using the language of the construction industry.	**Written** • Research project: Communication and Customer Service Skills • Tests and Quizzes • Self-Assessment • Guest Speaker Questions: HR • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation	**Career Ready Practices** CRP 1,2,4,8,12 **Cluster Standards** AC 1,5 **Pathway Standards** AC-CST 5	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math**

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
	• What strategies could be used to improve communication skills, especially when under stress at the job?		Checklist • Role Plays of Case Scenarios		
Weeks 8-9 **Employability Skills** **Work-Based Learning: Career Coaching, Field Trip**	• What are the key personal characteristics of successful employees? • What does responsibility look like as it relates to employability? • What does teamwork mean at a job site? • What are the key elements of professionalism? • Why is the ability to solve problems important in employment? • What is the best way to prepare for a job interview? • What can be learned from construction industry professionals?	• Identify the roles, responsibilities, and personal characteristics common in the construction industry. • Demonstrate responsibility, teamwork, respect and professionalism in the classroom and shop. • Work with peers and supervisors to solve problems and collectively accomplish tasks. • Participate in Career Coaching process. • Participate in field trip to a local construction company.	**Written** • Tests and Quizzes • Guest Speaker Questions: Interview Preparation • Career Coaching Self-Assessment • Field Trip Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Mock Interviews	**Career Ready Practices** CRP 1,2,4,8,9,10,11,12 **Cluster Standards** AC 1,5 **Pathway Standards** AC-CST 1,6 AC-DES 2,5 AC-MO 2	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math**
Weeks 10-13 **Construction Math**	• Why is knowledge of basic Algebra and Geometry important in building and construction trades? • How do math skills relate to specific building and construction projects? • How can solid math skills increase opportunities for career advancement and higher wages?	• Apply basic measurement functions. • Determine ratios, fractions, and proportion measures using correct formulas. • Determine correct math application for specific construction-related scenarios. • Determine percentages and decimals using appropriate formulas. • Determine area and volume of various structures using mathematical formulas. • Complete construction tasks using basic math functions.	**Written** • Measurement and Math Assignments • Tests and Quizzes • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Math Problem Scenarios	**Career Ready Practices** CRP 1,2,4,8,11 **Cluster Standards** AC 1 **Pathway Standards** AC-DES 8	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.CO.1,5 GEO-G.SRT.6,8 GEO-G.GPE.5,7 GEO-G.MG.1,3
Week 14 **Construction Math Project: Roofing**	• What is needed to calculate materials for a roofing project? • What sequence of steps are necessary to calculate the material needed for a roof system? • Why is it important to communicate using the language and terminology of the construction industry? • What is the job description for roofers?	• Identify the steps in calculating materials estimates. • Estimate resources and materials required for a specific project or problem. • Accurately express and interpret information and ideas using appropriate technical terms and language. • Describe the work and career opportunities of roofers in the construction industry.	**Written** • Research Project: Education, Wages and Responsibilities of Roofers • Project Description • Tests and Quizzes • Self-Assessment • Estimating Competition • Guest Speaker Questions: Roofing • Professional Portfolio	**Career Ready Practices** CRP 1,2,4,8,11 **Cluster Standards** AC 1,2 **Pathway Standards** AC-DES 2,8	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.CO.1,5 GEO-G.SRT.6,8 GEO-G.GPE.5,7 GEO-G.MG.1,3

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
	• What are the working conditions, job opportunities and average wages for roofers?		**Performance** • Safety Checklist • Teacher Observation Checklist • Construction Math Project		
Weeks 15-17 **Hand Tools and Safety**	• What are the basic hand tools used in building and construction trades? • What is the function of each tool? • What are the correct techniques for using different hand tools? • What safety considerations apply to the use of hand tools? • What is PPE (Personal Protective Equipment) and how does it relate to hand tool use?	• Explain industry standards for hand tool safety. • Identify and describe the function of hand tools. • Explain the importance of selecting the right tool(s) for specific tasks. • Use basic hand tools in compliance with all safety standards. • Explain the importance of tool maintenance and safety. • Analyze and describe the effects of unsafe tool applications for workers. • Describe what PPE should be utilized when using hand tools.	**Written** • Tool Identification and Use • Tests and Quizzes • Self-Assessment • Professional Portfolio **Performance** • Tool Selection and Application • Safety Checklist • Teacher Observation Checklist	**Career Ready Practices** CRP 1,2,3,4,8,11 **Cluster Standards** AC 1,3 **Pathway Standards** AC-CST 8,9 AC-MO 2,4,5	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG.3 AI-S.ID.1,2,3,5,6
Weeks 18-19 **Hand Tool Project** **Work-Based Learning: Career Coaching**	• How can basic hand tools be used to solve a problem? • How are appropriate tools selected for specific projects? • Why is safety in hand tool use important? • What can be learned from construction industry professionals?	• Select and justify the use of specific hand tools to complete a task. • Demonstrate safe hand tool use to complete tasks. • Develop a technical description of the project to be completed. • Participate in Career Coaching process.	**Written** • Tool Identification and Use • Project Description • Tests and Quizzes • Career Coaching Self-Assessment • Professional Portfolio **Performance** • Tool Selection and Application • Safety Checklist • Teacher Observation Checklist • Hand Tool Project	**Career Ready Practices** CRP 1,2,4,6,8,10,11 **Cluster Standards** AC 1,2,3 **Pathway Standards** AC-CST 8,9 AC-MO 2,4,5	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG 3 AI-S.ID.1,2,3,5,6
Weeks 20-22 **Power Tools and Safety**	• What are the basic power tools used in building and construction trades? • What is the function of each power tool? • What safety rules apply to different power tools? • What PPE should be used when using power tools? • What are the potential safety issues in the use of power tools?	• Describe the basic power tools used in the building and construction trades and their function. • Describe the safety rules that apply to different power tools. • Describe the PPE should be used when using power tools. • Apply safety protocols as prescribed for different power tools. • Explain potential safety issues for power tool use and make recommendations for their prevention.	**Written** • Tool Identification and Use • Tests and Quizzes • Career Coaching Self-Assessment • Professional Portfolio **Performance** • Tool Selection and Application • Safety Checklist • Teacher Observation Checklist	**Career Ready Practices** CRP 1,2,3,4,8,11 **Cluster Standards** AC 1,3 **Pathway Standards** AC-CST 8,9 AC-MO 2,4,5	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG.3 AI-S.ID.1,2,3,5,6

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Weeks 23-24 **Power Tool Projects**	• How can basic power tools be used to complete a task? • How are the correct power tools selected for a job? • Why are safety checks and PPE important when working with power tools?	• Select and justify the use of specific power tools to complete a task. • Demonstrate safe power tool use to complete tasks. • Develop a technical description of project to be completed.	**Written** • Tool Identification • Project Description • Tests and Quizzes • Career Coaching Self-Assessment • Professional Portfolio **Performance** • Tool Selection and Application • Safety Checklist • Teacher Observation Checklist • Power Tool Project	**Career Ready Practices** CRP 1,2,4,6,8,11 **Cluster Standards** AC 1,2,3 **Pathway Standards** AC-CST 8,9 AC-MO 2,4,5	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG.3 AI-S.ID.1,2,3,5,6
Weeks 25-27 **Construction Drawings**	• What are construction drawings? • How are project building requirements communicated accurately? • What are the industry standards for construction drawings? • How do industry standards affect construction drawings?	• Explain how construction drawing specifications and standards are used. • Explain what the industry standards are for construction drawings. • Read and interpret construction drawings. • Create construction drawings including specifications. • Use technical drawings and specifications to plan a project.	**Written** • Tests and Quizzes • Guest Speaker Questions: Architect • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Construction Drawings	**Career Ready Practices** CRP 1,2,4,8,11 **Cluster Standards** AC 1,6 **Pathway Standards** AC-DES 2,6,7	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.CO.9,12,13 GEO-G.SRT.1 GEO-G.MG.3 AI-N.Q.3
Weeks 28-29 **Construction Drawing Project** **Work-Based Learning: Career Coaching, Field Trip**	• Why is the ability to read and interpret building plans a necessary skill for the construction worker? • What are some commonly used software applications in construction drawings and plans? • How do basic skills in Computer-Aided Design (CAD) assist in the process of creating building plans? • What can be learned from construction industry professionals?	• Use architect's plan, manufacturer's illustrations, and other materials to communicate specific data and visualize proposed work. • Describe current computer software used to develop building and construction plans. • Explain how Computer-Aided Design has affected the construction industry. • Participate in Career Coaching process. • Participate in field trip to architectural firm.	**Written** • Tests and Quizzes • Career Coaching Self-Assessment • Field Trip Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Construction Drawings	**Career Ready Practices** CRP 1,2,4,8,10,11,12 **Cluster Standards** AC 1,6 **Pathway Standards** AC-DES 2,6,7	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.SRT.6,8 GEO-G.CO.2,6 GEO-G.GPE.6,7
Weeks 30-31 **Basic Construction Equipment Rigging**	• What is construction equipment rigging and how is it used in the industry? • Why is it important to determine how to safely move large, heavy loads?	• Explain and demonstrate principles of physics as they relate to working with materials and load applications. • Explain and demonstrate the effects of statics and loads on planning. • Select and justify the use of	**Written** • Rigging Equipment Identification and Function • Tests and Quizzes • Career Coaching Self-Assessment	**Career Ready Practices** CRP 1,2,4,8,11,12 **Cluster Standards** AC 1,3	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
	• What role does effective verbal and written communication play in working with peers and customers?	appropriate equipment for a specific construction project. • Explain the role of effective verbal and written communication in working with peers and customers.	• Guest Speaker Questions: Rigging • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Student worksheets • Rigging Equipment Selection		9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,8,9	**Math** AI-N.Q.1,3 GEO-G.CO.9 GEO-G.MG.1,2,3
Week 32 **Construction Materials Processing and Handling**	• What is meant by materials processing and handling? • Why is pre-task planning important for safe materials processing and handling? • What factors should be considered in determining correct materials handling?	• Identify the physical properties that need to be considered for handling materials safely, effectively, and efficiently. • Apply concepts of material handling based on physical properties.	**Written** • Materials and Physical Properties Identification • Tests and Quizzes • Career Coaching Self-Assessment • Guest Speaker Questions: Rigging • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Student worksheets • Processing and Handling Selection	**Career Ready Practices** CRP 1,2,4,8,11	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,2,3	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5	**Math** GEO-G.GMD.4 GEO-G.MG.1,2,3
Week 33 **Materials Rigging and Handling Project**	• How can mechanical advantage be used to move a heavy load? • What are five considerations involved in pre-task planning? • How would the best lifting or moving aid for a specific material be determined?	• Explain how mechanical advantage can be used to move a heavy load. • List and describe five considerations involved in pre-task planning. • Explain and demonstrate how to determine the best lifting or moving aid for a specific material.	**Written** • Tests and Quizzes • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Materials Rigging and Handling Project	**Career Ready Practices** CRP 1,2,4,8,11,12	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,2,3	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5	**Math** GEO-G.MG.1,2,3
Week 34 **Communication and Employability Skills**	• What kinds of information should be included in a resume? • What is included in a cover letter and how is it used? • What are the key elements to include in a professional email? • What are some possible career opportunities in the construction industry?	• Describe the kinds of information that should be included in a resume. • Explain what is included in a cover letter and how is it used. • Describe the key elements to include in a professional email. • Identify and research possible career opportunities in the construction industry.	**Written** • Resume and Cover Letter • Tests and Quizzes • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Materials Rigging and Handling Project	**Career Ready Practices** CRP 1,2,4,8,10,11	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,5	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 1,6 AC-DES 2,5 AC-MO 2	**Math**
Weeks 35-40			**Written**	**Career Ready Practices**	**ELA**

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
OSHA 10 Certification **Work-Based Learning: Career Coaching**	• What can be learned from construction industry professionals? • How does professional certification prepare the student for additional training through an apprenticeship or post-secondary education?	• Participate in Career Coaching process. • Identify training, education, and certification requirements for industry careers. • Review key learning targets to prepare for Assessment. • Complete requirements for OSHA 10 Certification.	• Career Coaching Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist	CRP 1,2,4,8,10,11	9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,4,5,7	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 8,9	**Math**

Syracuse City School District
Career and Technical Education Program
Course Syllabus
CNT200: Construction Technology 200

Pathway Overview

At the completion of the Construction Technology program, students will be able to apply the trade skills necessary for entry-level employment, apprenticeships, and post-secondary education. Students will study and practice safety training, framing, roofing, door and window installation, hand and power tool use, concrete, masonry and bricklaying, blueprint reading, plumbing, electrical, and construction equipment and rigging. Students will learn the theory of the construction process and have the opportunity to put those theories into practice with authentic, hands-on, project-based activities. Students will also have the opportunity to earn the MC3 (NABTU Trades Futures Multi-Craft Core Curriculum) as well as the OSHA 10 certifications, recognized throughout the construction industry as indicators that the individual is job ready.

Course Description

In Construction Technology 200, students will build on the knowledge and skills they learned in Construction Technology 100. Students will learn the basic skills, tools, and materials necessary to work in concrete, masonry and carpentry and will practice in a project-based learning environment to gain hands on experience. Students will practice with projects such as forming and pouring concrete, building block and stone retaining walls, and framing floors, walls, and roofs. Students will continue to practice safety in all aspects of the construction site and will focus on effective communication skills.

Work-Based Learning

Students will be connected with construction industry professionals in the community through Career Coaching, field trips and job shadowing, which could lead to further opportunities for direct job training and real-world experience. Students will create and maintain a portfolio of their work-based learning experiences throughout the program to document the development of their skills.

Additional Learning Opportunities

- **Micro-credentials:** Students may pursue learning experiences and credentials depending on the requirements of the projects that they are involved in. Some examples for this pathway include, but are not limited to:
    - OSHA 10 Construction Safety Certification
    - NABTU (North America's Building Trades Unions) Multi-Craft Core Curriculum (MC3)
    - Other relevant certifications as they become available through industry collaborations, teacher certifications and student interest.
- **Summer Bridge Enrichment:** Students will have the opportunity to participate in cross-curricular Summer Bridge programs to enhance and enrich their skills. Students will explore and create solutions that address authentic needs in the school and wider community with the involvement of local industry professionals. Students will build on skills learned during the school year to work collaboratively with students from other pathways and programs.

Pre-Requisites

CNT100 Construction Technology 100

Course Objectives

By the end of this course, students will:

1. Differentiate types of concrete and their components and identify appropriate uses for each type.
2. Select appropriate tools and equipment for completing concrete and masonry projects.
3. Apply carpentry skills to the construction of floor, wall, and roof systems.
4. Apply math formulas to estimate materials needed or procedures to construct sound building systems.
5. Use construction plans to read important information about a building site.
6. Safely secure and move materials through the use of Construction rigging procedures.
7. Communicate with others on the job site and be able to demonstrate the characteristics necessary for employment.
8. Review OSHA (Occupational Safety and Health Administration) 10 certification.

Integrated Academics

N/A

Student Equipment and Supplies

- **School will provide**: All necessary tools, materials, and classroom equipment.
- **Student will provide**: Leather work boots or shoes (steel/composite toe preferred), long work pants with no holes that cover the top of the shoe or boot, notebook for taking and saving notes, pen/pencils.

Resources and References

CITF: Carpenters International Training Fund. *Career Connections Introduction to Millwrighting*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Math for the Trades*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections One Trade, Many Careers*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 1*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 2*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 3*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 4*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

International Code Council. *2021 International Residential Code (International Code Council Series) 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2021.

—. *2024 International Building Code 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2024.

Grading

- Unit Classwork: 30%
- End of Unit Assessment: 30%
- Project Work: 20%
- Participation: 20%

Additional Course Policies

Students are required to follow all classroom professionalism and safety procedures.

Course Calendar

Quarter	Units of Study
1	• Introduction to Concrete Work: Tools, Equipment and Safety • OSHA Safety Review • Review of Construction Math • Introduction to Concrete Construction and Finishes • Site Layouts • Work-Based Learning: Career Coaching, Job Shadow
2	• Forming Concrete • Placing Concrete • Work-Based Learning: Career Coaching, Job Shadow
3	• Introduction to Masonry • Introduction to Carpentry Floor Systems • Work-Based Learning: Career Coaching, Job Shadow
4	• Wall Systems • Roof Systems • Work-Based Learning: Career Coaching, Job Shadow • Final Assessment

Syracuse City School District
Career and Technical Education Program
Scope and Sequence
CNT200: Construction Technology 200

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Weeks 1-2 **Introduction to Concrete Work: Tools, Equipment and Safety** **OSHA Safety Review**	• How should concrete tools and equipment be used and maintained? • What are the specific safety concerns that are important to be aware of while working with concrete? • What is an SDS? • What sort of Personal Protection Equipment (PPE) is necessary to have when working with concrete? • How important is worker safety in construction trades?	• Identify concrete tools and use them in compliance with safety standards. • Identify common concrete equipment and determine the appropriate equipment for each application at a construction site. • Care for and maintain the tool inventory at the end of the project. • Read and interpret safety data sheets. • Describe the PPE needed when working with concrete. • Implement personal and jobsite safety rules and regulations to maintain safe working conditions. • Review OSHA safety regulations and explain their importance for the construction trades.	**Written** • Group Project • Module Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project	**Career Ready Practices** CRP 1,2,3,4,7,8,11,12 **Cluster Standards** AC 1,3 **Pathway Standards** AC-CST 5 AC-MO 1	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math**
Week 3 **Review of Construction Math**	• Why is knowledge of basic Algebra and Geometry important in building and construction trades? • How do math skills relate to specific building and construction projects? • How can solid math skills increase opportunities for career advancement and higher wages?	• Apply basic measurement functions. • Determine ratios, fractions, and proportion measures using correct formulas. • Determine correct math application for specific construction-related scenarios. • Determine percentages and decimals using appropriate formulas. • Determine area and volume of various structures using mathematical formulas. • Complete construction tasks using basic math functions.	**Written** • Measurement and Math Assignments • Tests and Quizzes • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Math Problem Scenarios	**Career Ready Practices** CRP 1,2,4,8,11 **Cluster Standards** AC 1 **Pathway Standards** AC-DES 8	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.CO.1,5 GEO-G.SRT.6,8 GEO-G.GPE.5,7 GEO-G.MG.1,3
Weeks 4-5 **Introduction to Concrete Construction and Finishes**	• What are different types of concrete and their components? • What is Portland cement and how is it made? • What are two advantages of using additives in concrete? • How do climate and soil conditions affect concrete construction? • What does steel reinforcement bar do to	• Distinguish differentiate types of concrete and their components. • Describe Portland cement. • Explain the value of additives in concrete applications. • Explain how climate and soil conditions affect concrete construction. • Explain the principles of reinforcement bar in concrete projects. • Apply math measurement, area, and volume calculations to a project. • Select tools, machinery, equipment, and resources to meet the requirements of the project.	**Written** • Research Project and Presentation: Concrete Products, Uses and Finishes • Module Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Concrete Project	**Career Ready Practices** CRP 1,2,4,8,11,12 **Cluster Standards** AC 1,3 **Pathway Standards** AC-CST 5,8,9 AC-DES 8 AC-MO 1	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.GMD.1,3

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
	the strength of concrete in a building system?	• Use data and measurements to solve a construction problem.			
Weeks 6-10 **Site Layouts** **Work-Based Learning: Career Coaching, Job Shadow**	• What is the function of foundations? • Why is it vital that the footings and foundation of a structure be absolutely level and square? • What can be learned from construction industry professionals?	• Explain the purpose of foundations in project layouts. • Analyze the effects of footings and foundations on a jobsite. • Identify government regulations and building codes that apply to a specific jobsite. • Interpret drawings used in project planning. • Apply math measurement, area, and volume calculations to a project. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Written** • Research Project: Building Codes and Regulatory Agencies • Project Approval Documents • Measurement Assessment • Module Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project	**Career Ready Practices** CRP 1,2,4,8,10,11,12 **Cluster Standards** AC 1,6 **Pathway Standards** AC-CST 1,2,3,5,8	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG.1,3 GEO-G.GMD.4 GEO-G.GPE.5,6 GEO-G.CO.1,11,12
Weeks 11-15 **Forming Concrete**	• What are the key differences between pre-cast and cast-in-place concrete? • How is concrete form work typically built? • How are the resources and materials for a specific project determined?	• Distinguish between pre-cast and cast-in-place concrete and the advantages and disadvantages of each type. • Explain why form work is typically built by carpenters and not masons. • Estimate resources and materials required for a specific project. • Apply math measurement, area, and volume calculations to a project.	**Written** • Project Description • Estimate Assignment • Module Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project	**Career Ready Practices** CRP 1,2,4,8,11,12 **Cluster Standards** AC 1,2,3,5,6 **Pathway Standards** AC-CST 5,6,9 AC-DES 2,8	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG.3 GEO-G.C.5 GEO-G.CO.1,11,12
Weeks 16-20 **Placing Concrete** **Work-Based Learning: Career Coaching, Job Shadow**	• How are the number of yards of concrete that are required to complete a project calculated? • What are the tools and materials used to pour concrete? • Why is it important that concrete be aerated as it is being poured? • What can be learned from construction industry professionals?	• Perform calculations for determining the number of yards of concrete for a specific project. • Apply math measurement, area, and volume calculations to a project. • Select tools, machinery, equipment, and resources that match the requirements of the project. • Explain the importance of aerating concrete as it is being poured. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Written** • Group Project • Module Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project	**Career Ready Practices** CRP 1,2,4,8,10,11,12 **Cluster Standards** AC 1,2,3, **Pathway Standards** AC-CST 5,6,9 AC-DES 2,8	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6 **Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7 **Math** GEO-G.MG.2,3 GEO-G.CO.11
Weeks 21-24 **Introduction to**	• What are the major concrete masonry units	• Explain the major concrete masonry units (CMU) used in construction.	**Written** • Research Project:	**Career Ready Practices** CRP 1,2,4,8,11,12	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Masonry	(CMU) used in construction? • What is the purpose of the foundation system in structural design and construction?	• Explain the purpose of the foundation system in design and construction. • Examine building systems and components to evaluate their usefulness to a project. • Incorporate appropriate building systems into a construction project. • Apply math measurement, area, and volume calculations to a project.	Structure Failure • Module Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project		9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,2,3	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,8,9 AC-DES 8 AC-MO 1	**Math** GEO-G.MG.2,3 GEO-G.C.5
Weeks 25-30 **Introduction to Carpentry Floor Systems** **Work-Based Learning: Career Coaching, Job Shadow**	• What is the purpose of the wood framed floor system in building construction? • What are the key components of a floor system? • How does a carpenter determine the sizes of lumber needed for the construction of a floor system? • What can be learned from construction industry professionals?	• Explain the purpose of the wood framed floor system in building construction. • List and describe the key components of a floor system. • Describe and demonstrate how to determine the sizes of lumber needed for the construction of a floor system. • Identify building systems needed to complete a construction project. • Read, interpret, and use technical drawings, documents, and specifications to plan a project. • Identify government regulations and building codes that apply to a specific jobsite. • Apply math measurement, area, and volume calculations to a project. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Written** • Project Plan • Module Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project	**Career Ready Practices** CRP 1,2,4,8,10,11,12	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,3	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,8,9 AC-DES 8 AC-MO 1	**Math** GEO-G.MG.3 GEO-G.CO.1
Weeks 31-33 **Wall Systems**	• How is the wall system integral to an energy efficient building envelope? • What do headers do and why are they important? • What does 16 inches on center mean and why is it important?	• Explain how the wall system is integral to an energy efficient building envelope. • Explain what headers do and why they are important. • Explain 16 inches on center and why it is important. • Identify building systems needed to complete a construction project. • Read, interpret, and use technical drawings, documents, and specifications to plan a project. • Identify government regulations and building codes that apply to a specific jobsite. • Apply math measurement, area, and volume calculations to a project.	**Written** • Group Project • Module Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project	**Career Ready Practices** CRP 1,2,4,8,11.12	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,3	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,8,9 AC-DES 8 AC-MO 1	**Math** GEO-G.MG.3 GEO-G.GMD.4 GEO-G.GPE.6 GEO-G.CO.1
Weeks 34-38 **Roof Systems**	• Why are weather and climate key factors in	• Explain why weather and climate are key factors in determining roof systems.	**Written** • Research Project: Roof	**Career Ready Practices** CRP 1,2,4,8,10,11,12	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Work-Based Learning: Career Coaching, Job Shadow	determining roof systems? • What is the difference between a roof rafter and roof truss design in roofing systems? • What is pitch in roof design? • What can be learned from construction industry professionals?	• Describe the difference between a roof rafter and roof truss design. • Explain pitch in roof design. • Identify building systems needed to complete a construction project. • Read, interpret, and use technical drawings, documents, and specifications to plan a project. • Identify government regulations and building codes that apply to a specific jobsite. • Apply math measurement, area, and volume calculations to a project. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	Systems • Module Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Campus-Based Project		9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 1,3	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,8,9 AC-DES 8 AC-MO 1	**Math** GEO-G.GPE.5 GEO-G.MG.3 GEO-G.CO.1,7,8,10
Weeks 39-40 **Final Assessment**	• How does professional certification prepare the student for additional training through an apprenticeship or post-secondary education?	• Review key learning targets to prepare for Final Assessment. • Complete Final Assessment.	**Written** • Research Project: Career Pathways • Self-Assessment • Resume, Cover Letter and Applications • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Final Assessment	**Career Ready Practices** CRP 1,2,4,8,10,11	**ELA** 9-10R 1,2,4,7 9-10W 2,4,5,6,7 9-10SL 1,2,4,5,6 9-10L 1,2,3,6
				Cluster Standards AC 7	**Literacy** 9-10RST 1,2,4,7 9-10WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,8,9 AC-DES 4,8	**Math**

Syracuse City School District
Career and Technical Education Program
Course Syllabus
CNT 300: Construction Technology 300

Pathway Overview

At the completion of the Construction Technology program, students will be able to apply the trade skills necessary for entry-level employment, apprenticeships, and post-secondary education. Students will study and practice safety training, framing, roofing, door and window installation, hand and power tool use, concrete, masonry and bricklaying, blueprint reading, plumbing, electrical, and construction equipment and rigging. Students will learn the theory of the construction process and have the opportunity to put those theories into practice with authentic, hands-on, project-based activities. Students will also have the opportunity to earn the MC3 (NABTU Trades Futures Multi-Craft Core Curriculum) as well as the OSHA 10 certifications, recognized throughout the construction industry as indicators that the individual is job ready.

Course Description

In Construction Technology 300, students will continue to expand their knowledge and skills of the construction industry. Students will learn the skills necessary to work safely in plumbing, electrical, building envelope, and green building. Students will use the tools and materials for the four skill areas in a project-based learning environment to complete authentic projects, such as plumbing a bathroom, wiring a room with lights and receptacles, designing, and creating an energy efficient wall system, and experimenting with alternative energy models, including energy conservation. Students will continue to practice safety in all aspects of the construction site and will focus on effective communication skills.

Work-Based Learning

Students will be connected with construction industry professionals in the community through Career Coaching, field trips and job shadowing, which could lead to further opportunities for direct job training and real-world experience. Students will create and maintain a portfolio of their work-based learning experiences throughout the program to document the development of their skills.

Additional Learning Opportunities

- **Micro-credentials:** Students may pursue learning experiences and credentials depending on the requirements of the projects that they are involved in. Some examples for this pathway include, but are not limited to:
    - OSHA 10 Construction Safety Certification
    - NABTU (North America's Building Trades Unions) Multi-Craft Core Curriculum (MC3)
    - Other relevant certifications as they become available through industry collaborations, teacher certifications and student interest.
- **Summer Bridge Enrichment:** Students will have the opportunity to participate in cross-curricular Summer Bridge programs to enhance and enrich their skills. Students will explore and create solutions that address authentic needs in the school and wider community with the involvement of local industry professionals. Students will build on skills learned during the school year to work collaboratively with students from other pathways and programs.

Pre-Requisites

CNT100 Construction Technology 100
CNT200 Construction Technology 200

Course Objectives

By the end of this course, students will:

1. Demonstrate skill with plumbing tools, equipment, and materials in the application of basic plumbing activities.
2. Apply skills in electrical theory to perform basic electrical activities in residential construction.
3. Apply the concepts of building envelope systems and weatherization techniques.
4. Apply concepts of green building and alternative energy practices to construction projects.
5. Use math formulas for accurate measurements and performing estimates for construction projects.
6. Perform all work activities in compliance with OSHA safety regulations.
7. Apply effective communication and relationship management skills with supervisors, peers, and customers as necessary for sustained employment in the construction field.
8. Review OSHA (Occupational Safety and Health Administration) 10 certification.

Integrated Academics

1 Integrated CTE Math Credit

Equipment and Supplies

- **School will provide**: All necessary tools, materials, and classroom equipment.
- **Student will provide**: Leather work boots or shoes (steel/composite toe preferred), long work pants with no holes that cover the top of the shoe or boot, notebook for taking and saving notes, pen/pencils.

Resources and References

CITF: Carpenters International Training Fund. *Career Connections Introduction to Millwrighting*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Math for the Trades*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections One Trade, Many Careers*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

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—. *Career Connections Project Book 2*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 3*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 4*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

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—. *2024 International Building Code 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2024.

Grading

- Unit Classwork: 30%
- End of Unit Assessment: 30%
- Project Work: 20%
- Participation: 20%

Additional Course Policies

Students are required to follow all classroom professionalism and safety procedures.

Course Calendar:

Quarter	Units of Study
1	• Introduction to the Plumbing Profession • OSHA Safety Review • Review of Construction Math • Plumbing Safety • Tools and Equipment of the Plumbing Trade • Plastic Pipe and Fittings • Work-Based Learning: Career Coaching, Job Shadow
2	• Copper Pipe and Fittings • Introduction to the Electrical Trades • Electrical Safety • Introduction to Electrical Circuits • Work-Based Learning: Career Coaching, Job Shadow
3	• Electrical Theory • Electrical Projects • Introduction to Building Envelope Systems • Work-Based Learning: Career Coaching, Job Shadow
4	• Green Building Environments • Capstone Project • Work-Based Learning: Career Coaching, Job Shadow

Syracuse City School District
Career and Technical Education Program
Scope and Sequence
CNT300: Construction Technology 300

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Weeks 1-3 **Introduction to the Plumbing Profession** **OSHA Safety Review** **Review of Construction Math**	• What are the career opportunities in the plumbing profession? • What are the names of associations in the plumbing profession? • What education and training is required for plumbers? • What personal attributes are important for success in the plumbing trade? • How important is worker safety in construction trades? • Why is knowledge of basic Algebra and Geometry important in building and construction trades? • How do math skills relate to specific building and construction projects? • How can solid math skills increase opportunities for career advancement and higher wages?	• Explain the education and training levels for the plumbing trade. • Describe the skills and personal attributes necessary for success in the plumbing profession. • Explain the rationale for licensing and certification in the plumbing trade. • Explain the advantages and disadvantages of a career in the plumbing trade. • Assess personal attributes and compare them to those required of the profession. • Use of plumbing-related vocabulary accurately and effectively. • Review OSHA safety regulations and explain their importance for the construction trades. • Apply basic measurement functions. • Determine ratios, fractions, and proportion measures using correct formulas. • Determine correct math application for specific construction-related scenarios. • Determine percentages and decimals using appropriate formulas. • Determine area and volume of various structures using mathematical formulas. • Complete construction tasks using basic math functions.	**Written** • Research Project: Plumbing Careers • Group Presentations: Plumbing Topics • Measurement and Math Assignments • Tests and Quizzes • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Math Problem Scenarios • Teacher Observation Checklist	**Career Ready Practice** CRP 1,2,4,7,8,10,11,12 **Cluster Standards** AC 1,4,7 **Pathway Standards** AC-CST 1 AC-DES 8	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** GEO-G.CO.1,5 GEO-G.SRT.6,8 GEO-G.GPE.5,7 GEO-G.MG.1,3
Weeks 4-5 **Plumbing Safety**	• What specific safety concerns should workers be aware of when installing plumbing? • What are the reasons for building codes for plumbing? • What are common jobsite plumbing accidents and the reasons for them? • What are the costs to employers, employees and society for jobsite plumbing accidents?	• Describe specific safety concerns that workers should be aware of when installing plumbing. • Explain the reason for standardized plumbing codes and describe the penalties to contractors for noncompliance. • List common jobsite plumbing accidents and explain why they occur. • Explain who bears the costs of accidents at each level: contractors, employees, and society. • Describe and comply with all safety rules, including required PPE.	**Written** • Research Project: Economic Impact of Lost Time Accidents • Safety Signs and Hazard Symbols Identification • Unit Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Plumbing Project	**Career Ready Practice** CRP 1,2,3,4,8,11,12 **Cluster Standards** AC 1,3 **Pathway Standards** AC-CST 5,9	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks 6-7 **Tools and**	• What are the common hand tools are used in plumbing?	• Identify and demonstrate the use of common hand tools used in plumbing.	**Written** • Unit Assessment	**Career Ready Practice** CRP 1,2,4,8,11,12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Equipment of the Plumbing Trade	• What are the common power tools used in the plumbing? • How are plumbing tools and equipment used and maintained? • What safety rules and regulations apply to the use of hand and power tools?	• Identify and demonstrate the use of common power tools used in plumbing. • Properly maintain plumbing tools and equipment. • Explain and demonstrate safe use of plumbing hand and power tools and equipment. • Demonstrate effective use of hand and power tools to complete a task or project.	• Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Plumbing Project		11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,3	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,9	**Math**
Weeks 8-9 **Plastic Pipe and Fittings** **Work-Based Learning: Career Coaching, Job Shadow**	• What are the different types of plumbing pipes and fittings? • What are the different types of plastic pipes and fittings? • What are the advantages and disadvantages of using plastic pipe compared to metal pipe (copper, galvanized and cast iron)? • When should plastic pipe be used in plumbing applications? • How is plastic pipe measured, cut, and joined? • Do plumbing codes apply to plastic pipe use? • What can be learned from construction industry professionals?	• Describe the different types of plumbing pipes and fittings and their properties. • Describe different types of plastic pipes and fittings and their properties, including ABS, PVC, CPVE, PE, PEX and PB piping. • Explain the advantages and disadvantages of using plastic pipe compared to metal pipe (copper, galvanized and cast iron)? • Explain when plastic pipe should be used in plumbing applications and what building codes apply. • Determine the appropriate type of plastic pipes and fittings for a given project. • Accurately measure, cut, and join plastic pipe for a specific project. • Apply appropriate math formulas for calculating measurements. • Accurately apply plumbing vocabulary to describe and complete tasks. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Written** • Measurement Assessment • Unit Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Plumbing Project	**Career Ready Practice** CRP 1,2,4,8,10,11,12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,2,3	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 3,7,8	**Math** GEO-G.MG.3
Weeks 10-12 **Copper Pipe and Fittings**	• What properties of copper make it a suitable material for plumbing pipes and fittings? • How are valves used in copper pipe systems? • What methods are used for cutting and joining copper pipe? • Why has the composition of solder changed over the years? • How is insulation used with copper pipes? • What building codes apply to the use of copper pipes? • What information is contained in an SDS?	• Describe the properties of copper pipe. • Explain how valves are used in copper pipe systems. • Measure, cut, and join copper pipe for a project. • Explain the composition of solder as it relates to joining copper pipes. • Determine when to insulate copper piping in various situations. • Describe the building codes that apply to the use of copper pipes. • Demonstrate safe use of copper pipe in completing a project. • Use SDS (Safety Data Sheets) information to manage, use and dispose of materials used in a project. • Use of trade-related vocabulary accurately.	**Written** • Unit Assessment • Interpretation of selected products SDS sheets • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Plumbing Project	**Career Ready Practice** CRP 1,2,4,5,8,11,12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,2,3	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,9	**Math** GEO-G.MG.3

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Weeks 13-14 **Introduction to the Electrical Trades**	• What are the career paths available for electrical workers? • What are the career specific requirements to become a qualified electrician? • What is the IBEW? • What are common working environments for electricians? • How do different trades and professions work together to complete a project.	• Explore available electrical trade career and employment opportunities. • Research career specific requirements to become a qualified electrician. • Explain the role of the IBEW. • Describe various work environments for electrical workers. • Explain different trades and professions work together to complete a project.	**Written** • Unit Assessment • Questions for Panel: Electricians and Employment Expectations • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist	**Career Ready Practice** CRP 1,2,4,8,10,11 **Cluster Standards** AC 1,7 **Pathway Standards** AC-CST 5	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks 15-17 **Electrical Safety**	• Who determines safety standards for electricians? • What are the specific safety considerations to be aware of before and during the installation of electrical systems at a construction site? • What is lockout/tagout?	• Describe OSHA's role in electrical worker safety. • Describe standard electrical precautions and hazards found at a job site. • Explain lockout/tagout procedures. • Interpret standard safety and hazard symbols related to electrical workers. • Explain and demonstrate with all safety precautions in assigned projects.	**Written** • Unit Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist	**Career Ready Practice** CRP 1,2,3,4,8,11 **Cluster Standards** AC 1,3, **Pathway Standards** AC-CST 5,9	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks 18-20 **Introduction to Electrical Circuits** **Work-Based Learning: Career Coaching, Job Shadow**	• What is Ohm's law? • What is resistance? • How is math used in electric power equations? • What are the different types of electrical circuits? • What is a GFCI (Ground Fault Circuit Interrupter)? • Why is it important to know what the load on a circuit will be before a circuit is designed and installed? • What can be learned from construction industry professionals?	• Explain and apply Ohm's law to assigned tasks. • Explain electrical resistance and how it is measured. • Apply electrical math formulas in solving problems. • Identify different types of circuits in electrical applications. • Explain the function and purpose of a GFCI. • Accurately calculate load in the design and installation of a circuit. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Written** • Electrical Formula Assessment • Electrical Lab Assignments • Unit Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist	**Career Ready Practice** CRP 1,2,4,8,10,11 **Cluster Standards** AC 1,3,6 **Pathway Standards** AC-CST 3,9	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** AI-A.CED.4
Weeks 21-22 **Electrical Theory**	• How is Ohm's law applied when installing electrical systems? • What is voltage? • What is the purpose of the NEC (National Electrical Code)? • What are NEC tables and how are they used?	• Explain how Ohm's law is applied when installing electrical systems. • Explain what voltage is and how it is measured. • Explain what the NEC is and its purpose. • Describe the NEC tables and how they are used. • Apply NEC codes in an assigned project.	**Written** • Electrical Formula Assessment • Electrical Lab Assignments • Questions for Guest Lecturer: IBEW • Unit Assessment • Self-Assessment • Professional Portfolio	**Career Ready Practice** CRP 1,2,4,8,11,12 **Cluster Standards** AC 1,2,5,7 **Pathway Standards** AC-CST 5	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** AI-A.CED.1

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
			Performance • Safety Checklist • Teacher Observation Checklist • Electrical Project		
Weeks 23-24 **Electrical Projects**	• What are the steps in planning for the installation of a residential electrical system? • What considerations are important in these planning decisions?	• Explain the steps in planning for the installation of a residential electrical system. • Describe the considerations that are important in planning decisions. • Plan, implement, and complete an electrical project.	**Written** • Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Electrical Project	**Career Ready Practice** CRP 1,2,4,8,11,12 **Cluster Standards** AC 1,2,3,4,6 **Pathway Standards** AC-CST 1,2,4,8,9	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** GEO-G.GMD.4
Weeks 25-28 **Introduction to Building Envelope Systems** **Work-Based Learning: Career Coaching, Job Shadow**	• What does building envelope mean? • What factors are considered in improving a building's energy efficiency? • What steps should be taken to determine a building's energy efficiency? • What can be learned from construction industry professionals?	• Explain what a building envelope is. • Describe the skills and concepts used in energy audits. • Describe the audit process and results to consumers. • Explain the effects of sealing, heat loss, and insulating materials to energy efficiency. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Written** • Lab Assignment: Weatherization Techniques • Unit Assessment • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist	**Career Ready Practice** CRP 1,2,4,5,8,11 **Cluster Standards** AC 1,4 **Pathway Standards** AC-CST 3,8	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** GEO-G.GMD.3
Weeks 29-34 **Green Building Environments**	• What does green environment mean in a building project? • What does sustainability mean? • What are alternative and renewable energy sources? • What is the system for rating buildings for a green environment? • What does LEED stand for?	• Explain what a green environment means in a building project. • Explain what sustainability means. • Describe different alternative and renewable energy sources. • Describe advantages and disadvantages of alternative and renewable energy sources. • Describe standards for green building design and construction. • Define LEED and cite the process for LEED certification.	**Written** • Group Projects: Alternative Energy and Sustainability • Unit Assessment • Self-Assessment • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Lab Projects	**Career Ready Practice** CRP 1,2,4,5,8,11,12 **Cluster Standards** AC 1,3,4, **Pathway Standards** AC-CST 1,7 AC-DES 1,3,4,8	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** GEO-G.MG.3
Weeks 35-40 **Capstone Project** **Work-Based Learning: Career**	• What sorts of organizational systems should be employed when starting a large project? • How can effective teamwork be encouraged while completing a group project? • In what ways can knowledge	• Plan, implement and complete a Capstone Project including application of knowledge and skills learned throughout the year. • Work effectively with a team while completing a project. • Employ planning and time management skills and tools to enhance results and	**Written** • Project Plan and Progress Reports • Career Coaching Self-Assessment • Job Shadow Reflection • Professional Portfolio	**Career Ready Practice** CRP 1,2,4,8,10,11,12 **Cluster Standards** AC 1,2,3,4,5,6	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Coaching, Job Shadow	and skills of building construction be demonstrated? • What can be learned from construction industry professionals?	complete work tasks. • Participate in Career Coaching process. • Participate in job shadow with construction industry professionals.	**Performance** • Safety Checklist • Teacher Observation Checklist • Capstone Project	**Pathway Standards** AC-CST 1,2,3,4,5,6 AC-DES 1,2,3,4,6,7	**Math** GEO-G.MG.3

Syracuse City School District
Career and Technical Education Program
Course Syllabus
CNT400: Construction Technology 400

Pathway Overview

At the completion of the Construction Technology program, students will be able to apply the trade skills necessary for entry-level employment, apprenticeships, and post-secondary education. Students will study and practice safety training, framing, roofing, door and window installation, hand and power tool use, concrete, masonry and bricklaying, blueprint reading, plumbing, electrical, and construction equipment and rigging. Students will learn the theory of the construction process and have the opportunity to put those theories into practice with authentic, hands-on, project-based activities. Students will also have the opportunity to earn the MC3 (NABTU Trades Futures Multi-Craft Core Curriculum) as well as the OSHA 10 certifications, recognized throughout the construction industry as indicators that the individual is job ready.

Course Description

In this course, students will take their knowledge and skills to greater depths by participating in a variety of project-based activities and work-based learning experiences. Students will practice work safety in all aspects of the construction trades while enhancing their skills. Students will participate in projects that integrate job readiness practices, including effective verbal and written communication, critical thinking and problem solving. Students will prepare for post-secondary training, education, and careers by completing professional resumes, cover letters, and job interviews. Students will have the opportunity to complete OSHA 10 certification as well as MC3 certification.

Work-Based Learning

Students will be connected with construction industry professionals in the community through Career Coaching, and internships which could lead to further opportunities for direct job training and real-world experience. Students will create and maintain a portfolio of their work-based learning experiences throughout the program to document the development of their skills.

Additional Learning Opportunities

- **Micro-credentials:** Students may pursue learning experiences and credentials depending on the requirements of the projects that they are involved in. Some examples for this pathway include, but are not limited to:
    - OSHA 10 Construction Safety Certification
    - NABTU (North America's Building Trades Unions) Multi-Craft Core Curriculum (MC3)
    - Other relevant certifications as they become available through industry collaborations, teacher certifications and student interest.
- **Summer Bridge Enrichment:** Students will have the opportunity to participate in cross-curricular Summer Bridge programs to enhance and enrich their skills. Students will explore and create solutions that address authentic needs in the school and wider community with the involvement of local industry professionals. Students will build on skills learned during the school year to work collaboratively with students from other pathways and programs.

Pre-Requisites

CNT100 Construction Technology 100
CNT200 Construction Technology 200
CNT300 Construction Technology 300

Course Objectives

By the end of this course, students will:

1. Complete an internship with a local construction industry business.
2. Demonstrate practices and behaviors consistent with employer expectations.
3. Apply effective communication and relationship management skills with supervisors, peers, and customers as necessary for sustained employment in the construction field.
4. Communicate with employers and worksite supervisors in the technical language of the profession.
5. Complete all project-based activities in compliance with local building codes and regulations.
6. Perform all work activities in compliance with OSHA safety regulations.
7. Understand how various construction-related career areas interconnect during the various phases of building projects.

8. Use math formulas for accurate measurements and performing estimates for construction projects.
9. Review OSHA (Occupational Safety and Health Administration) 10 certification.

Integrated Academics

1 Integrated CTE ELA Credit

Equipment and Supplies

- **School will provide**: All necessary tools, materials, and classroom equipment.
- **Student will provide**: Leather work boots or shoes (steel/composite toe preferred), long work pants with no holes that cover the top of the shoe or boot, notebook for taking and saving notes, pen/pencils.

Resources and References

CITF: Carpenters International Training Fund. *Career Connections Introduction to Millwrighting*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Math for the Trades*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections One Trade, Many Careers*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 1*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 2*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 3*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

—. *Career Connections Project Book 4*. Las Vegas, NV: CITF: Carpenters International Training Fund, 2010.

International Code Council. *2021 International Residential Code (International Code Council Series) 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2021.

—. *2024 International Building Code 1st Edition*. Washington, D.C.: ICC (distributed by Cengage Learning), 2024.

Grading

- Unit Classwork: 30%
- End of Unit Assessment: 30%
- Project Work: 20%
- Participation: 20%

Additional Course Policies

Students are required to follow all classroom professionalism and safety procedures.

Course Calendar

Quarter	Units of Study
1	• Course Expectations and Career Preparation • OSHA Safety Review • Site Layout: Differential Leveling • Review of Construction Math • Slab-On-Grade Foundations • Internship and Career Preparation • Work-Based Learning: Career Coaching
2	• Workplace Communication • Floor Installation and Finishing Project • Stair Layout Projects • Wall Systems and Application Projects • Work-Based Learning: Career Coaching
3	• Drywall Installation and Finishing • Career Readiness • Roof Framing and Applications Projects • Exterior Finishing Applications • Work-Based Learning: Internship
4	• Legal and Ethical Practices in the Trades • Final Project Proposals • Project Proposal Resubmissions • Individual Project Work • Portfolios • Project Presentations • Work-Based Learning: Career Coaching

Syracuse City School District
Career and Technical Education Program
Scope and Sequence
CNT400: Construction Technology 400

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Weeks 1-4 **Course Expectations and Career Preparation** **OSHA Safety Review** **Site Layout: Differential Leveling** **Review of Construction Math**	• What are the outcomes and expectations for students in Construction Technology 400? • What career opportunities are available in carpentry and construction? • What are ways to prepare for a career interview? • How important is worker safety in construction trades? • What equipment and methods are used in differential leveling? • Why is knowledge of basic Algebra and Geometry important in building and construction trades? • How do math skills relate to specific building and construction projects? • How can solid math skills increase opportunities for career advancement and higher wages?	• List and describe the outcomes and expectations for Construction 400 students. • Identify career opportunities and training levels for carpentry and construction workers. • Prepare for a career interview. • Review OSHA safety regulations and explain their importance for the construction trades. • Describe the equipment and methods used in differential leveling. • Apply principles and methods in differential site leveling accurately operate equipment. • Describe responsibilities of surveyors, field engineers and carpenters in differential leveling. • Apply basic measurement functions. • Determine ratios, fractions, and proportion measures using correct formulas. • Determine correct math application for specific construction-related scenarios. • Determine percentages and decimals using appropriate formulas. • Determine area and volume of various structures using mathematical formulas. • Complete construction tasks using basic math functions.	**Written** • Measurement and Math Assignments • Tests and Quizzes • Research Project: Career Opportunities • Questions for Guest Speakers • Interview Questions • Interview Report • Employability Profile • Professional Portfolio **Performance** • Math Problem Scenarios Safety Checklist • Teacher Observation Checklist • Differential Leveling Project • Career Interview	**Career Ready Practices** CRP 1,2,3,4,7,9,10,11 **Cluster Standards** AC 1,2,4,5,6,7 **Pathway Standards** AC-CST 1,2,4,5,6,8,9 AC-DES 8	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** GEO-G.MG.1,3 GEO-G.GMD.4 GEO-G.GPE.5,6,7 GEO-G.CO.1,5,11,12,13 GEO-G.SRT.6,8
Weeks 5-6 **Slab-On-Grade Foundations**	• How are safety, tools and forms different in slab-on-grade applications? • Where are slab-on-grade applications used? • What safety and building code regulations should be considered for slab-on-grade applications?	• Identify and describe tools and methods in foundation and slab-on-grade projects. • Distinguish appropriate foundation type based on site layout. • Identify foundation related codes and safety regulations in a construction project.	**Written** • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Slab-On-Grade Project	**Career Ready Practices** CRP 1,2,3,4,8,11,12 **Cluster Standards** AC 1,2,5,6 **Pathway Standards** AC-CST 9	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math** GEO-G.MG.2 GEO-G.CO.11
Weeks 7-10 **Internship and**	• What kinds of information should be	• Identify appropriate responsibilities and personal characteristics by researching	**Written** • Resumes and Cover Letters	**Career Ready Practices** CRP 1,2,4,7,8,9,10,11	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Career Preparation **Work-Based Learning: Career Coaching**	included in a résumé? • What is the function of a cover letter and what are its key elements? • How should professional email correspondence look? • How can knowledge of construction drawings be applied to a project? • What can be learned from construction industry professionals?	workplace and jobsite information. • Identify the essential elements of the resume and cover letter. • Explain what information is required to complete the job application. • Design and construct a project based on student developed drawings. • Participate in Career Coaching process.	• Questions for Guest Speakers • Career Coaching Self-Assessment • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Shop Project		11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC1,5	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 1,6 AC-DES 2,5 AC-MO 2	**Math** GEO-G.CO.9,12,13 GEO-G.SRT.1 GEO-G.MG.3 AI-N.Q.3
Weeks 11-14 **Workplace Communication** **Floor Installation and Finishing Project** **Stair Layout Projects**	• What are the components of effective communication with site supervisors and coworkers? • When should a worker ask for help at an internship or job? • What factors should be considered when deciding which floor finish to use at a construction job? • What are the steps in planning and building stairs?	• Exchange verbal and written information using technical language. • Describe and demonstrate effective communication with site supervisors and peers applying technical and career ready practice skills. • Explain when and how a worker should ask for help on a job. • Explain and demonstrate now to select appropriate floor finishes in multi-room settings. • List and explain the steps in planning and building stairs.	**Written** • Assignment: Employer Communication • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Roleplay: Effective Communication • Shop Project	**Career Ready Practices** CRP 1,2,4,7,9,10,11,12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,5,6	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 1,5,9 AC-DES 2,3,6	**Math** GEO-G.MG.3 GEO-G.CO.1
Weeks 18-20 **Wall Systems and Application Projects** **Work-Based Learning: Career Coaching**	• What is essential to know about wall framing, including window and door openings? • What information is needed to complete a materials estimate? • How should the walls be supported? • What techniques are used to keep walls square? • What can be learned from construction industry professionals?	• Apply construction concepts to wall framing project. • Follow procedures for door and window openings. • Explain what information is needed to complete a materials estimate. • Complete a detailed estimate for a shop project. • Select and utilize materials, tools, and methods for wall construction, including bracing and corner construction. • Participate in Career Coaching process.	**Written** • Detailed Estimates for Shop Project • Materials List • Materials Estimate for Wall Project • Career Coaching Self-Assessment • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Wall Project	**Career Ready Practices** CRP 1,2,4,6,7,8,9,10,11,12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,2,3,6	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 1,5,9 AC-DES 2,3,6	**Math** GEO-G.MG.3 GEO-G.GMD.4 GEO-G.GPE.6 GEO-G.CO.1
Weeks 21-24 **Drywall Installation and Finishing**	• What information is needed to install and finish drywall? • Where is drywall used	• Identify and explain drywall types and uses, fasteners and installation methods. • Select materials and tools to finish	**Written** • Research and Presentation: Current Construction Job Listings	**Career Ready Practices** CRP 1,2,4,5,7,9,10,11	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Career Readiness	and how many different types of gypsum are used? • Why are Career Ready Practices important in construction trades?	installed drywall. • Accurately measure, cut, and install drywall. • Demonstrate dry wall finish techniques. • Cite examples for the twelve Career Ready Practices. • Apply effective communication skills with employers and peers.	• Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Dry Wall Project	**Cluster Standards** AC 1,2,3,6	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 5,6,9 AC-DES 2,3,6	**Math** GEO-G.MG.3 GEO-G.GMD.4 GEO-G.GPE.6 GEO-G.CO.1
Weeks 25-27 **Roof Framing and Applications Projects**	• How does climate affect the type of roofing materials? • What factors should be considered to determine which methods and materials to use for a specific job? • How is roof pitch determined?	• Explain how climate affects the type of roofing materials used. • Explain how to determine which methods and materials to use for a specific roofing job. • Explain and calculate correct roof pitch. • Use correct tools, materials, and procedures for selected jobs. • Plan and construct a roof.	**Written** • Pitch Calculation • Materials Estimate • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Roofing Project	**Career Ready Practices** CRP 1-12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1-5,7	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 4,5,9	**Math** GEO-G.CO.1,5 GEO-G.SRT.6,8 GEO-G.GPE.5,7 GEO-G.MG.1
Weeks 28-30 **Exterior Finishing Applications** **Work-Based Learning: Internship**	• Why is the correct exterior finish an important part of a construction project? • What are the local building codes for exterior finishing? • What are common questions a typical job interview? • What is the best way to follow up after a job interview? • What can be learned from construction industry professionals? • Why are internships necessary? • How does an internship experience contribute to a professional portfolio?	• Explain the importance of correct exterior finish to a construction project. • List and describe local building codes for exterior finishing. • Describe and apply moisture barriers and insulation. • Compare and contrast siding applications, including characteristics, advantages, and disadvantages. • Describe and install a variety of sidings. • Determine appropriate type and install flashing material. • Participate in a professional interview. • Explain how various construction industry professionals work together for the common goal of customer service. • Explain the importance of professionalism and ethics in the workplace. • Comply with workplace policies and regulations. • Participate in internship with construction industry business. • Apply knowledge and skills from the classroom to internship situations.	**Written** • Research: Siding Applications • Interview Questions and Reflection • Internship Self-Assessment • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Exterior Finishing Project	**Career Ready Practices** CRP 1-12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1-5,7	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 4,5,9 AC-DES 2,3,8	**Math** GEO-G.MG.3
Weeks 31-32 **Legal and Ethical**	• What are the consequences of illegal	• Explain the consequences of illegal or unethical practices in the construction	**Written** • Summary: Current Legal	**Career Ready Practices** CRP 1-12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	CCTC Standards	NYS Standards
Practices in the Trades **Final Project Proposals**	or unethical practices in the construction industry? • How will the projects be selected and what should they include? • How will they be evaluated? • What resources are needed to complete an independent project?	industry. • Research potential construction projects. • Develop proposal for independent construction project, including resources and timeline need for completion.	and Ethical Cases • Position Paper: Legal or Ethical Case Study • Project Proposal • Project Progress Checks • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Project		11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,2,5,7	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 4,5,9 AC-DES 1,9	**Math**
Week 33 **Project Proposal Resubmissions**	• What changes need to be made to the project proposal for resubmission?	• Review project proposal feedback and edit as required. • Submit final proposals.	**Written** • Final Project Proposal • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Shop Project	**Career Ready Practices** CRP 1,2,3,4,5,6,8,9,11,12	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 4,9	**Math**
Weeks 34-38 **Individual Project Work** **Portfolios**	• What are the best resources for the independent project? • What help will be needed to organize and complete the project? • What portfolio documents will be needed for the final portfolio review?	• Locate resources to support the project. • Plan, organize and complete independent construction projects. • Organize portfolio documents for presentation to a professional panel.	**Written** • Project Progress Checks • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Shop Project	**Career Ready Practices** CRP 1,2,4,5,6,7,8,9,11	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 4,9	**Math**
Weeks 39-40 **Project Presentations** **Work-Based Learning: Career Coaching**	• What are the components of an informative presentation? • What key elements make up effective speeches? • What does a presenter need to know about the target audience and why is it important? • What can be learned from construction industry professionals?	• Complete independent project and develop presentation. • Present to peers and construction industry professionals. • Participate in Career Coaching process.	**Written** • Project Progress Checks • Presentation: Project and Portfolio • Career Coaching Self-Assessment • Employability Profile • Professional Portfolio **Performance** • Safety Checklist • Teacher Observation Checklist • Shop Project	**Career Ready Practices** CRP 1,2,4,6,7,8,9,11	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 4,9	**Math**

NABTU Trades Futures Multi-Craft Core Curriculum (MC3) Crosswalk with SCSD Construction Technology Curriculum

Unit/ Hours	Content	Objectives (Student will be able to…)	Construction Technology 100 Unit of Study	Construction Technology 200 Unit of Study	Construction Technology 300 Unit of Study	Construction Technology 400 Unit of Study
Unit 1: Orientation and Industry Awareness 16 Hours Required	**Construction Industry Overview (8 Hours Required)**	• Explain how the construction industry operates. • Identify the different trades and professions in the construction industry and what they do. • Describe the demographics and composition of those who work in the construction trades. • Familiarize themselves with the wages and benefits of construction industry jobs. • Identify and emulate behaviors that lead to a successful career in construction. • Make an informed decision about whether to make a career in the construction industry	• Weeks 8-9 Employability Skills • Weeks 8-9 Work-Based Learning: Career Coaching, Field Trip • Weeks 10-13 Construction Math • Week 14 Construction Math Project: Roofing • Weeks 18-19 Work-Based Learning: Career Coaching • Weeks 28-29 Work-Based Learning: Career Coaching, Field Trip • Week 34 Communication and Employability Skills • Weeks 35-40 Work-Based Learning: Career Coaching	• Weeks 6-10 Work-Based Learning: Career Coaching, Job Shadow • Weeks 16-20 Work-Based Learning: Career Coaching, Job Shadow • Weeks 25-30 Work-Based Learning: Career Coaching, Job Shadow • Weeks 34-38 Work-Based Learning: Career Coaching, Job Shadow • Weeks 39-40 Final Assessment	• Weeks 1-2 Introduction to the Plumbing Profession • Weeks 8-9 Work-Based Learning: Career Coaching, Job Shadow • Weeks 13-14 Introduction to Electrical Trades • Weeks 18-20 Work-Based Learning: Career Coaching, Job Shadow • Weeks 25-28 Work-Based Learning: Career Coaching, Job Shadow • Weeks 35-40 Work-Based Learning: Career Coaching, Job Shadow	• Weeks 1-4 Course Expectations and Career Preparation • Weeks 7-10 Internships and Career Preparation • Weeks 7-10 Work-Based Learning: Career Coaching • Weeks 18-20 Work-Based Learning: Career Coaching • Weeks 21-24 Career Ready Practices • Weeks 28-30 Work-Based Learning: Internship • Weeks 39-40 Work-Based Learning: Career Coaching
	Trade Unions and Apprenticeship (8 Hours Required)	• Explain what a union is and identify the benefits and services it provides. • Explain what it means to be a union member and identify member roles and responsibilities to the union. • Explain what construction trades apprentices are and do. • Explain the rights and responsibilities of an apprentice. • Explain the process for becoming an apprentice. • Develop a plan for setting and achieving SMART goals to attain a construction career	•	•	•	•
Unit 2: Tools 8 Hours Required	**(Must Include Hands-On Component)**	• Identify the common tools and materials on construction sites. • Handle construction tools in a safe manner	• Weeks 15-17 Hand Tools and Safety • Weeks 18-19 Hand Tool Projects • Weeks 20-22 Power Tools and Safety • Weeks 23-24 Power Tool Projects	• Weeks 1-2 Introduction to Concrete Work, Tools Equipment and Safety	• Weeks 6-7 Tools and Equipment of the Plumbing Trade	• Weeks 5-6 Slab-on-Grade Foundations • Weeks 18-20 Wall Systems Application Projects • Weeks 21-24 Drywall Installation and Finishing • Weeks 25-27 Roof Framing Application Projects
Unit 3: Construction Health and Safety 20 Hours	**OSHA 10 (10 Hours Required)**	• Receive an OSHA 10 card	• Weeks 1-4 Basic Safety	• Weeks 1-2 OSHA Safety Review	• Weeks 1-3 OSHA Safety Review • Weeks 15-17 Electrical Safety	• Weeks 1-4 OSHA Safety Review
	First Aid and CPR (8 Hours Required)	• Receive a 1 year Community CPR certificate. • Receive a 3 year Community First Aid certificate	•	•	•	•

Unit/ Hours	Content	Objectives (Student will be able to…)	Construction Technology 100 Unit of Study	Construction Technology 200 Unit of Study	Construction Technology 300 Unit of Study	Construction Technology 400 Unit of Study
	Health and Safety Issues for Women (2 Hours Required)	• Describe why gender matters in health and safety in construction. • Describe how health and safety issues are impacted by gender. • Describe how issues that are specific to gender can be safety concerns. • Demonstrate what individuals can do to protect themselves and their co-workers. • Promote equitable health and safety practices and policies in the workplace	•	•	•	•
Unit 4: Blueprint Reading 4-8 Hours Elective	**Basic Blueprint Reading Principles (4 Hours Elective)**	• Define blueprint and blueprint reading. • Define plans and specifications. • Describe how plans and specifications are prepared. • Describe the proper handling of plans. • Describe the purpose and the importance of a set of plans. • Identify and describe the features of the cover page and title block	• Weeks 25-27 Construction Drawings • Weeks 28-29 Construction Drawing Project	• Weeks 6-10 Site Layouts • Weeks 25-30 Introduction to Carpentry Floor Systems • Weeks 31-33 Wall Systems • Weeks 34-38 Roof Systems	•	• Weeks 7-10 Internship and Career Preparation
	Plans and Drawings (8 Hours Elective)	• Identify the various views of a drawing that are included in a set of plans and their relationship to each other. • Identify and define the various parts of a set of plans, such as details, etc. • Identify and define material symbols, abbreviations, and lines used in drawings. • Demonstrate proper handling procedures for a printed set of plans and drawings. • Define the meaning of “scale.” • Use a fractional rule to calculate measurements.	• Weeks 25-27 Construction Drawings • Weeks 28-29 Construction Drawing Project	• Weeks 6-10 Site Layouts • Weeks 25-30 Introduction to Carpentry Floor Systems • Weeks 31-33 Wall Systems • Weeks 34-38 Roof Systems	•	• Weeks 7-10 Internship and Career Preparation
	Scales and Dimensions (16 Hours Elective)	• Identify the difference between engineer (civil) and architect scales. • Describe the use and purpose of scales and measurements on architectural and shop drawings. • Use a scale to measure objects shown on architectural or shop drawings and interpret the results. • Read and utilize shop drawings and describe their use and purpose. • Describe the use and importance of specifications. • Determine accurate dimensions using the scale on a full view architectural drawing and shop drawing.	• Weeks 25-27 Construction Drawings • Weeks 28-29 Construction Drawing Project	• Weeks 6-10 Site Layouts • Weeks 25-30 Introduction to Carpentry Floor Systems • Weeks 31-33 Wall Systems • Weeks 34-38 Roof Systems	•	• Weeks 7-10 Internship and Career Preparation

Unit/ Hours	Content	Objectives (Student will be able to…)	Construction Technology 100 Unit of Study	Construction Technology 200 Unit of Study	Construction Technology 300 Unit of Study	Construction Technology 400 Unit of Study
Unit 5: Construction Math 40 Hours Required	**Construction Math**	• Trace the history of mathematics and identify systems of measurement. • Perform mathematical operations with whole numbers. • Perform mathematical operations with common fractions. • Perform mathematical operations with decimal fractions	• Weeks 10-13 Construction Math • Week 14 Construction Math Roofing Projects	• Weeks 3-5 Introduction to Concrete Construction and Finishes • Weeks 6-10 Site Layouts • Weeks 11-15 Forming Concrete • Weeks 16-20 Placing Concrete • Weeks 21-24 Introduction to Masonry • Weeks 25-30 Introduction to Carpentry Floor Systems • Weeks 31-33 Wall Systems • Weeks 34-38 Roof Systems	• Weeks 8-9 Plastic Pipe and Fittings • Weeks 18-20 Introduction to Electrical Circuits	•
Unit 6: Heritage of the American Worker 8 Hours Required	**Heritage of the American Worker**	• Describe the “artisan system” of work and skills training in the early years of the American republic, including different roles in this system performed by master craftsmen, journeymen and apprentices. • Describe why building and construction tradesmen joined forces in the late 19th century to improve their situations and the reasons these workers chose trade or craft unions as the best types of organizations to achieve their goals. • Describe the impact of government policy and federal involvement in labor issues on the building trades. • Identify and define the purpose of key pieces of federal legislation affecting the building trades, such as the Fitzgerald Act, and the Taft Hartley Act. • Describe how many Building Trades locals tried to limit access to training programs to friends, family members, and other insiders; how this limited access kept out racial minorities; and how these practices undermined the reputation of the Buildings Trades around the country. • Be familiar with the steps that policy makers and Building Trades leaders took to address the lack of diversity in the trades, and why these changes were slow in coming at the local level. • Describe the series of attacks by powerful business interests throughout labor history to push back against growing strength of the building trades. • Describe new initiatives of the building trades intended to recruit new members and increase diversity among apprentices and in the general membership, through programs such as the Multi-Craft Core Curriculum,	•	•	•	•

Unit/ Hours	Content	Objectives (Student will be able to…)	Construction Technology 100 Unit of Study	Construction Technology 200 Unit of Study	Construction Technology 300 Unit of Study	Construction Technology 400 Unit of Study
		Helmets to Hardhats, the NABTU Tradeswomen Committee and others.				
Unit 7: Diversity Awareness and Sexual Harassment 12 Hours Required	**Diversity Awareness (4 Hours Required)**	• Explain the importance of a diverse workforce in the construction industry. • Identify the importance of the construction industry to diverse populations. • Identify the historical and social roots of under-representation of women and minorities in the trades. • Explain the barriers and challenges to building a diverse construction workforce and an equitable worksite. • Explain what it means to be a culturally competent person and organization. • Identify equal employment opportunity and non-discrimination rights in the workplace and classroom	•	•	•	•
	Preventing Sexual Harassment (8 Hours Required)	• Identify respectful practices and behaviors in the workplace. • Distinguish between legal application of sexual harassment and workplace policies for acceptable behavior. • Recognize and define different forms of sexual harassment. • Explain why sexual harassment is a problem in the construction workplace. • Identify who is harmed by sexual harassment. • Demonstrate action steps to take in response to witnessing or experiencing sexual harassment	•	•	•	•
Unit 8: Green Construction 4-8 Hours Elective	**General (4-8 Hours Elective)**	• Describe the basics elements of green construction and green buildings and the part they will play as a construction worker on green job sites. • Understand basic green building terms. • Describe the role of green building certification and how it works. • Recognize green awareness on construction projects, including sustainable site development, efficient use of water resources, energy conservation, the use of sustainable building materials, reducing and recycling construction waste and protecting indoor and outdoor environmental quality.	•	•	• Weeks 29-34 Green Building Environments	•
	Offshore Wind Construction (2 Hours Supplemental)	• Describe the basic elements of offshore wind turbines and understand the installation process. • Understand the benefits and challenges of offshore wind power plants. • Describe the outlook for offshore wind projects and identify regions that these projects will be located in; and • Understand the basic elements of floating offshore wind turbines and identify the differences between monopile turbines.	•	•	•	•

Unit/ Hours	Content	Objectives (Student will be able to…)	Construction Technology 100 Unit of Study	Construction Technology 200 Unit of Study	Construction Technology 300 Unit of Study	Construction Technology 400 Unit of Study
Unit 9: Financial Literacy 4-8 Hours Elective	**Financial Literacy**	• Identify the rationale for understanding financial literacy. • Construct a budget. • Devise a strategy for savings and debt management. • Define financial services and products for financial security.	•	•	•	•

Syracuse City School District
Career and Technical Education Program
MC3: Multi-Craft Core Curriculum
Course Syllabus

Course Description

The Multi-Craft Core Curriculum (MC3) introduces students to the different building trades and teaches them the skills necessary to successfully apply for and succeed in a registered apprenticeship program. The MC3 provides apprentice-level content to young people interested in construction and the building trades. Students will learn about the wide variety of careers and job opportunities with the construction and building trades as well as the fundamental skill needed for success in an apprenticeship program including safety, commonly used tools on a construction site, math and measurement, plans and specifications, the role of trade unions, and current trends in green construction. Students will also increase their awareness of the issues of diversity and gender within the construction industry and how those issues are being addressed. Students will also develop their own financial literacy and money management skills. Students who successfully complete the program will have the opportunity to apply for a registered apprenticeship program in their area of interest.

Work-Based Learning

Students will be connected with construction and building trades professionals in the community through Career Coaching, field trips and job shadowing which could lead to further opportunities for direct job training and real-world experience. Students will create and maintain a portfolio of their work-based learning experiences throughout the program to document the development of their skills.

Additional Learning Opportunities

- **Micro-credentials:** Students may pursue learning experiences and credentials depending on the requirements of the projects that they are involved in. Some examples for this pathway include, but are not limited to:
  - 1 year Community CPR Certification
  - 3 year Community First Aid Certification
  - OSHA-10 Certification
  - Other relevant certifications as they become available through industry collaborations, teacher certifications and student interest.
- **Summer Bridge Enrichment:** Students will have the opportunity to participate in cross-curricular Summer Bridge programs to enhance and enrich their skills. Students will explore and create solutions that address authentic needs in the school and wider community with the involvement of local industry professionals. Students will build on skills learned during the school year to work collaboratively with students from other pathways and programs.

Pre-Requisites

N/A

Course Objectives

By the end of this course, students will:

1. Describe the career and job opportunities in the construction and building trades.
2. Explain the role of the trade unions in the training and skilled workers.
3. Safely and accurately use hand tools in construction projects.
4. Implement key safety procedures while working on a construction site.
5. Qualify for OSHA (Occupational Safety and Health Administration) 10 certification, CPR Certification and First Aid Certification.
6. Read and interpret building plans to access information necessary to complete construction projects.
7. Apply basic math to calculate measurements in construction activities.
8. Explain the importance of diversity in the building trades.
9. Describe the impact of sexual harassment in the workplace and the steps needed to prevent it.
10. Describe the current trends in green construction.
11. Apply financial literacy skills to manage personal finances.

Integrated Academics

TBD

Equipment and Supplies

- **School will provide**: All necessary tools, materials and classroom equipment.
- **Student will provide**: TBD.

Textbook

TradesFutures MC3 Learning Management System

Grading

TBD

Additional Course Policies

Students are expected to:

- Meet all deadlines and be on time. Meeting deadlines and being on time are a major part of being a building trades professional.
- Produce their best work, including being prepared presentations.
- Participate in class including contributing to discussions and critiquing their own and others' work, as well as diligently working on their own projects.
- Seek help when needed.
- Be attentive, ask questions if they do not understand something, and offer their opinions.
- Give credit and use proper citations for all research and project ideas.

Course Calendar

Quarter	Units of Study
1	• Unit 1A: Construction Industry Awareness (8 Hours) • Unit 1B: Construction Trades Awareness (8 Hours) • Unit 2: Tools and Materials (8 Hours)

2	• Unit 3: Construction Health and Safety (20 Hours)
	  ○ CPR and First Aid
	  ○ OSHA 10
	  ○ Women's Health and Safety
	• Unit 4: Blueprint Reading (8 Hours)

3	• Unit 5: Basic Math for Construction (40 Hours)

4	• Unit 6: Heritage of the American Worker (8 Hours)
	• Unit 7: Diversity in the Construction Industry (12 Hours)
	  ○ Diversity Awareness
	  ○ Sexual Harassment
	• Unit 8: Green Construction (4 Hours)
	• Unit 9: Financial Literacy (4 Hours)

120 Hours Total Required Instructional Time

Syracuse City School District
Career and Technical Education Program
Scope and Sequence
MC3: Multi-craft Core Curriculum

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Resources and Assessment*	CCTC Standards	NYS Standards
Weeks 1-3 **Unit 1A: Construction Industry Awareness** **8 Hours**	• How does the construction industry operate? • What are the different trades and professions in the construction industry and what do they do? • What kinds of people work in the construction trades? • What are the wages and benefits of construction industry jobs? • What behaviors can lead to a successful career in construction?	• Explain how the construction industry operates. • Identify the different trades and professions in the construction industry and what they do. • Describe the demographics and composition of those who work in the construction trades. • Familiarize themselves with the wages and benefits of construction industry jobs. • Identify and emulate behaviors that lead to a successful career in construction. • Make an informed decision about whether to make a career in the construction industry.	• **Readings:** Instructor Text Book • **PowerPoints:** Construction Industry Facts and Figures; Practices for Success in Construction: Attitudes and Behavior; Overview of the Construction Industry • **Handouts and Exercises:** Different Trades Overview Worksheet • **Videos:** More than Just a Building; Core Communications 1; Core Communications 2; Respect Scenario; Workplace Respect; Ethics and Honesty Scenario; Conflict Scenario • **Misc. Resources:** Helmets to Hardhats Brochure	**Career Ready Practices** CRP 1,2,4,10,11 **Cluster Standards** AC 1,4,5,7 **Pathway Standards** AC-CST 1 AC-DES 2 AC-MO 1	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks 4-5 **Unit 1B: Construction Trades Awareness** (or Trade Unions and Apprenticeship or Building Trades and Apprenticeship) **8 Hours**	• What is a union and what are the benefits and services it provides? • What does it mean to be a union member? • What are the roles and responsibilities of a union member? • What are construction trades apprentices and what do they do? • What are then the rights and responsibilities of an apprentice? • What is the process for becoming an apprentice? • How does setting and achieving SMART goals help in attaining a construction career.	• Explain what a union is and identify the benefits and services it provides. • Explain what it means to be a union member and identify member roles and responsibilities to the union. • Explain what construction trades apprentices are and do. • Explain the rights and responsibilities of an apprentice. • Explain the process for becoming an apprentice. • Develop a plan for setting and achieving SMART goals to attain a construction career.	• **Readings:** Text book (Flipbook) • **PowerPoints:** Unions: What They Do; Apprenticeship 101; Apprenticeship Yesterday and Today; Apprenticeship and You; Interview Skills; Motivation and Setting Goals • **Handouts and Exercises:** Attributes Interviewers Assess in Candidates; Interview Rating Worksheet; Interview Tip Sheet; Illegal Interview Questions • **Videos:** MI Trades Construction Career Video Series; Cleveland Building Trades Council Video; San Diego Building Trades Council Video • **Miscellaneous Resources:** Collective Bargaining Agreements (IBEW and LIUNA); NABTU Affiliates' Codes of Conduct; Interview Skills Sample Volunteer Invitation Letter; Why a Union Apprenticeship; NABTU Apprenticeship Readiness Brochure	**Career Ready Practices** CRP 1,2,4,10,11 **Cluster Standards** AC 1,4,5,7 **Pathway Standards** AC-CST 1 AC-DES 2 AC-MO 1	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Resources and Assessment*	CCTC Standards	NYS Standards
Weeks 6-8 **Unit 2: Tools and Materials** **8 Hours**	• What are the basic hand tools used on construction sites? • What is the function of each tool? • What are the correct techniques for using different hand tools? • What safety considerations apply to the use of hand tools?	• Identify the common tools and materials on construction sites. • Handle construction tools in a safe manner.	• **PowerPoints:** Tool Classification; Bits and Blades • **Miscellaneous Resources:** Hands on Training Suggestions	**Career Ready Practices** CRP 1,2,4,8,10,11 **Cluster Standards** AC 1,3, **Pathway Standards** AC-CST 5,8,9 AC-DES 2 AC-MO 1,3	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks 9-15 **Unit 3: Construction Health and Safety:** • **CPR and First Aid** • **OSHA 10** • **Women's Health and Safety** **20 Hours**	• What are the requirements to receive an OSHA 10 card? • What are the requirements to receive a 1 year Community CPR certificate? • What are the requirements to receive a 3 year Community First Aid certificate? • Why does gender matter in health and safety in construction? • How are health and safety issues are impacted by gender? • How can issues that are specific to gender be safety concerns? • What can individuals do to protect themselves and their co-workers? • How can workers promote equitable health and safety practices and policies in the workplace?	• Receive an OSHA 10 card. • Receive a 1 year Community CPR certificate. • Receive a 3 year Community First Aid certificate. • Describe why gender matters in health and safety in construction. • Describe how health and safety issues are impacted by gender. • Describe how issues that are specific to gender can be safety concerns. • Demonstrate what individuals can do to protect themselves and their co-workers. • Promote equitable health and safety practices and policies in the workplace.	• **Readings:** All Readings and Other Teaching Aides Provided Within OSHA 10 • **PowerPoints:** Construction Health and Safety: Women in the Construction Workplace • **Handouts and Exercises:** Health and Safety for Women Quiz and Answer Key • **Miscellaneous Resources:** Smart Mark OSHA 10 Instructions. (Information about accessing NABTU's endorsed Smart Mark program via their building trades partners OR accessing a different approved program using a certified instructor); Instructions for Meeting First Aide CPR Objectives Using American Red Cross Delivery; Link For Construction PPE Resources for Female Workers	**Career Ready Practices** CRP 1,2,3,4,8,10,11 **Cluster Standards** AC 1,3 **Pathway Standards** AC-CST 5 AC-DES 2 AC-MO 1	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks16-18 **Unit 4: Blueprint Reading** **8 Hours**	• What are blueprints? • What skills are needed to read blueprints? • What are plans and specifications and how are they prepared? • How should plans be handled?	• Define blueprint and blueprint reading. • Define plans and specifications. • Describe how plans and specifications are prepared. • Describe the proper handling of plans. • Describe the purpose and the importance of a set of plans.	• **Readings:** Blueprint Reading Principles: Plans and Drawings Manual • **PowerPoints:** Manual in PPT Format; Instructor notes in PPT Format • **Handouts and Exercises:** Assessment Questions and Answer Key; Day One Exercise Questions	**Career Ready Practices** CRP 1,2,4,8,10,11 **Cluster Standards** AC 1,6 **Pathway Standards** AC-CST 8	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Resources and Assessment*	CCTC Standards	NYS Standards
	• What is the purpose and the importance of a set of plans? • What are the features of the cover page and title block? • What are the various views of a drawing that are included in a set of plans and what is their relationship to each other? • What are the various parts of a set of plans? • What are the material symbols, abbreviations, and lines used in drawings? • What is the meaning of "scale?" • How is a fractional rule used to calculate measurements?	• Identify and describe the features of the cover page and title block. • Identify the various views of a drawing that are included in a set of plans and their relationship to each other. • Identify and define the various parts of a set of plans, such as details, etc. • Identify and define material symbols, abbreviations, and lines used in drawings. • Demonstrate proper handling procedures for a printed set of plans and drawings. • Define the meaning of "scale." • Use a fractional rule to calculate measurements.	• **Miscellaneous Resources:** IUPAT HQ Plans; Sample house plans (CAD and Hand Drawn)	AC-DES 2,6 AC-MO 1	
Weeks 19-31 **Unit 5: Basic Math for Construction** (or Construction Math) **40 Hours**	• Why is knowledge of basic algebra and geometry important in building and construction trades? • How do math skills relate to specific building and construction projects? • How can math skills increase opportunities for career advancement and higher wages?	• Trace the history of mathematics and identify systems of measurement. • Perform mathematical operations with whole numbers. • Perform mathematical operations with common fractions. • Perform mathematical operations with decimal fractions. • Apply basic measurement functions. • Determine ratios, fractions, and proportion measures using correct formulas. • Determine correct math application for specific construction-related scenarios. • Determine percentages and decimals using appropriate formulas. • Determine area and volume of various structures using mathematical formulas. • Complete construction tasks using basic math functions.	• Readings: Instructor Textbook: Construction Mathematics for Craftworkers; Student Workbook • PowerPoints: Course Introduction; Whole Numbers; Common Fractions; Decimals Fractions; Measurement • Handouts and Exercises: : Assignments Sheets and Tests • Miscellaneous Resources: Self-Paced Electronic Math Refreshers; Addition, Subtraction, Multiplication and Division; Basic Math Measurements; Fractions (Basic); Decimals, Percents and Geometry; Additional Math Resources Sheet for Construction Math	**Career Ready Practices** CRP 1,2,4,8,10,11 **Cluster Standards** AC 1 **Pathway Standards** AC-CST 8 AC-DES 2 AC-MO 1	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Weeks 32-34				**Career Ready Practices** CRP 1,2,4,7,8,10,11	**ELA** 11-12R 1,2,4,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Resources and Assessment*	CCTC Standards	NYS Standards
Unit 6: Heritage of the American Worker **8 Hours**	• What was the system of work and skills training in the early years of the American republic? • Why and how did building and construction tradesmen join forces in the late 19th century to improve their situations? • What is the impact of government policy and federal involvement in labor issues on the building trades? • What is the purpose of federal legislation affecting the building trades? • How did actions by Building Trades locals undermine the reputation of the Buildings Trades around the country? • What steps did policy makers and Building Trades leaders take to address the lack of diversity in the trades? • How did powerful business interests push back against the growing strength of the building trades? • What new initiatives of the building trades are intended to recruit new members and increase diversity?	• Describe the "artisan system" of work and skills training in the early years of the American republic, including different roles in this system performed by master craftsmen, journeymen and apprentices. • Describe why building and construction tradesmen joined forces in the late 19th century to improve their situations and the reasons these workers chose trade or craft unions as the best types of organizations to achieve their goals. • Describe the impact of government policy and federal involvement in labor issues on the building trades. • Identify and define the purpose of key pieces of federal legislation affecting the building trades, such as the Fitzgerald Act, and the Taft Hartley Act. • Describe how many Building Trades locals tried to limit access to training programs to friends, family members, and other insiders; how this limited access kept out racial minorities; and how these practices undermined the reputation of the Buildings Trades around the country. • Outline the steps that policy makers and Building Trades leaders took to address the lack of diversity in the trades, and why these changes were slow in coming at the local level. • Describe the series of attacks by powerful business interests throughout labor history to push back against growing strength of the building trades. • Describe new initiatives of the building trades intended to recruit new members and increase diversity among apprentices and in the general membership, through programs such as the Multi-Craft	• **Readings:** Workers' Heritage in the Building Trades (Flipbook) • **PowerPoints:** Workers' Heritage in the Building Trades • **Handouts and Exercises:** Glossary of Terms; Dig Where You Stand Activity Sheet • **Videos:** Listing of Links to Individual Construction Union History Videos • **Miscellaneous Resources:** Discussion Questions		11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,4,5	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 1 AC-DES 2 AC-MO 1	**Math**

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Resources and Assessment*	CCTC Standards	NYS Standards
		Core Curriculum, Helmets to Hardhats, the NABTU Tradeswomen Committee and others.			
Weeks 35-38 **Unit 7: Diversity in the Construction Industry** • **Diversity Awareness** • **Sexual Harassment** **12 Hours**	• What is the importance of a diverse workforce in the construction industry? • What is the importance of the construction industry to diverse populations? • What are the historical and social roots of under-representation of women and minorities in the trades? • What are the barriers and challenges to building a diverse construction workforce and an equitable worksite? • What does it mean to be a culturally competent person and organization? • What does equal employment opportunity mean? • What do respectful practices and behaviors in the workplace look like? • What is the difference between the legal application of sexual harassment and workplace policies for acceptable behavior? • What are different forms of sexual harassment? • Why is sexual harassment a problem in the construction workplace? • Who is harmed by sexual harassment? • What action steps should be taken in response to witnessing or experiencing sexual harassment?	• Explain the importance of a diverse workforce in the construction industry. • Identify the importance of the construction industry to diverse populations. • Identify the historical and social roots of under-representation of women and minorities in the trades. • Explain the barriers and challenges to building a diverse construction workforce and an equitable worksite. • Explain what it means to be a culturally competent person and organization. • Identify equal employment opportunity and non-discrimination rights in the workplace and classroom. • Identify respectful practices and behaviors in the workplace. • Distinguish between legal application of sexual harassment and workplace policies for acceptable behavior. • Recognize and define different forms of sexual harassment. • Explain why sexual harassment is a problem in the construction workplace. • Identify who is harmed by sexual harassment. • Demonstrate action steps to take in response to witnessing or experiencing sexual harassment.	• **PowerPoints:** Cultural Competency; Cultural Competency and the High Performing Workplace; Gender Lens: Images and Words are Powerful; Sexual Harassment: Being Part of the Solution • **Handouts and Exercises:** Myths and Facts about Women in the Trades; Gender Lens Myths and Quiz; Identifying Gender Neutral Terms (Exercise); Springboard for Discussing Discrimination; 10 Myths of Affirmative Action; History of Affirmative Action; Gender Equity Quiz and Answer Key; Impact of Sexual Harassment Review Sheet; Myths and Stereotypes Activity Sheet and Answer Guide; Scenario Activity Sheets; Sexual Harassment Wrap-up Quiz and Answer Key • **Videos:** Sisters in the Brotherhood (Available Only Upon Request from NABTU); Respectful Workplaces; Widen the Screen; Cleveland Building Trades and Diversity; Women Workers Put Construction Industry on Notice (ABC News Article and Clip) • **Miscellaneous Resources:** Putting a Gender Lens on the MC3 PPT; Be that One Guy; EEOC Case Study (Hill Construction); ENR Me Too in Construction Article; NYT Article: Why Victims Aren't Believed	**Career Ready Practices** CRP 1,2,4,5,8,9,10,11 **Cluster Standards** AC 1,4,5 **Pathway Standards** AC-CST 1 AC-DES 2,5 AC-MO 1	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6 **Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7 **Math**
Week 39 **Unit 8: Green**	• What are the basic elements of green	• Describe the basic elements of green construction and green	• **Readings:** Fundamentals of Building Green Workbook; Will	**Career Ready Practices** CRP 1,2,4,7,8,10,11	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7

Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Resources and Assessment*	CCTC Standards	NYS Standards
Construction **4 Hours**	construction and green buildings? • What part do construction workers play on green job sites? • How does green building certification work and what is its role? • What are aspects of green construction to be aware of on construction projects?	buildings and the part they will play as a construction worker on green job sites. • Understand basic green building terms. • Describe the role of green building certification and how it works. • Recognize green awareness on construction projects, including sustainable site development, efficient use of water resources, energy conservation, the use of sustainable building materials, reducing and recycling construction waste and protecting indoor and outdoor environmental quality.	Floating Turbines Usher in a New Wave of Offshore Wind? • **PowerPoints:** Chapter PPTs (1-2 and 3-5) Related to Part A: Sustainability (With Notes); Chapter PPTs (6-10 and 11-13) Related to Part B: Green Building Practice (With Notes); Offshore Wind Supplemental Lesson • **Handouts and Exercises:** Offshore Wind Proposed Investments Interactive Map • **Videos:** How It All Comes Together at Sea: Installing an Offshore Wind Farm; Floating Offshore Wind Turbine Installation- Kincardine Project Scotland • **Miscellaneous Resources:** FUND Instructors' Guidelines; Link to Several Videos on Green Construction from the CA State Building Trades Council; Offshore Wind 101: Diagrams and Definitions; Wind Farm Assembly Documentary; U.S. Department of Energy Offshore Wind Report; Wildlife and Wind Power; The Economic Impact of U.S. Offshore Wind Power		11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1,4,5,7	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-CST 8 AC-DES 2 AC-MO 1	**Math**
Week 40 **Unit 9: Financial Literacy** **4 Hours**	• Why should construction workers understand financial literacy? • What are the steps in constructing a budget? • Why is it important to have strategy for savings and debt management? • What financial services and products contribute to financial security?	• Identify the rationale for understanding financial literacy. • Construct a budget. • Devise a strategy for savings and debt management. • Define financial services and products for financial security.	• **PowerPoints:** Building a Foundation for Financial Security • **Handouts:** Where to Stash Your Cash; Budget planning Worksheet and Exercise; Ways to Save Money; Stock Market Exercise Worksheet • **Miscellaneous Resources:** Glossary of Terms; Helpful Resources; Your Money Your Goals Toolkit	**Career Ready Practices** CRP 1,2,3,4,8,10,11	**ELA** 11-12R 1,2,4,7 11-12W 2,4,5,6,7 11-12SL 1,2,4,5,6 11-12L 1,2,3,6
				Cluster Standards AC 1	**Literacy** 11-12RST 1,2,4,7 11-12WHST 2,4,5,6,7
				Pathway Standards AC-DES 2 AC-MO 1	**Math**

*Listed Resources are available through the TradesFutures MC3 Learning Management System and may be changed and updated.

CCTC: Common Career and Technical Core Standards for MC3: Multi-Craft Core Curriculum

Area	Number	Standard
Career Ready Practices	**CRP 1**	Act as a responsible and contributing citizen and employee.
	CRP 2	Apply appropriate academic and technical skills.
	CRP 3	Attend to personal health and financial well-being.
	CRP 4	Communicate clearly and effectively and with reason.
	CRP 5	Consider the environmental, social and economic impacts of decisions.
	CRP 6	Demonstrate creativity and innovation.
	CRP 7	Employ valid and reliable research strategies.
	CRP 8	Utilize critical thinking to make sense of problems and persevere in solving them.
	CRP 9	Model integrity, ethical leadership and effective management.
	CRP 10	Plan education and career paths aligned to personal goals.
	CRP 11	Use technology to enhance productivity.
	CRP 12	Work productively in teams while using cultural global competence.
Career Cluster: **Architecture & Construction**	**AC 1**	Use vocabulary, symbols and formulas commonly used in design and construction.
	AC 2	Use architecture and construction skills to create and manage a project.
	AC 3	Comply with regulations and applicable codes to establish and manage a legal and safe workplace/jobsite.
	AC 4	Understand the nature and scope of the Architecture & Construction Career Cluster and the role architecture and construction play in society and the economy.
	AC 5	Understand the roles and responsibilities among trades and professions, including labor/management relationships.
	AC 6	Read, interpret, and use technical drawings, documents, and specifications to plan a project.
	AC 7	Evaluate a wide range of career concentration opportunities for success in architecture and construction careers.
Career Pathway: **Construction**	**AC-CST 1**	Understand contractual relationships with all parties involved in the building process to ensure successful build of a project.
	AC-CST 2	Understand approval procedures to ensure effective flow of information in the construction process.
	AC-CST 3	Understand and implement testing and inspection procedures to ensure successful completion of a construction project.
	AC-CST 4	Understand the purpose of scheduling as it relates to the successful completion of a construction project.
	AC-CST 5	Understand and apply practices and procedures required to maintain jobsite safety.
	AC-CST 6	Manage relationships with internal and external parties to successfully complete construction projects.
	AC-CST 7	Compare and contrast the building systems and components for a given project.
	AC-CST 8	Demonstrate the construction crafts required for each phase of a given project.
	AC-CST 9	Safely use and maintain appropriate tools, machinery, equipment, and resources to accomplish construction project goals.
Career Pathway: **Design/ Pre-Construction**	**AC-DES 1**	Justify design solutions through the use of research documentation and analysis of data.
	AC-DES 2	Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.
	AC-DES 3	Understand the integral systems that impact the design of buildings and structures.
	AC-DES 4	Apply building codes, laws and rules in the design and construction of projects.
	AC-DES 5	Identify the diversity of needs, values, and social patterns in project design, including accessibility standards, to appropriately meet client needs.
	AC-DES 6	Apply the techniques and skills of modern drafting, design, engineering, and construction to projects.
	AC-DES 7	Employ appropriate representational media to communicate concepts and design.
	AC-DES 8	Apply principles, conventions, standards, applications, and restrictions pertaining to the selection and use of construction materials, components, and assemblies for project design.
Career Pathway: **Maintenance/ Operations**	**AC-MO 1**	Recognize and employ universal construction signs and symbols to function safely in the workplace.
	AC-MO 2	Use troubleshooting procedures when solving a maintenance problem to maintain buildings and structures.
	AC-MO 3	Apply construction skills when repairing, restoring, or renovating existing structures.
	AC-MO 4	Determine work required to repair or renovate an existing building or structure.
	AC-MO 5	Plan and practice preventative maintenance activities to service existing structures.
	AC-MO 6	Maintain and inspect building systems to achieve safe and efficient operation of facilities.

Full Text: Career Ready Practices Full Text: Architecture & Construction

New York State Standards for ELA and Literacy

NYS ELA Standards

11th-12th Grade Reading Standards (Literary and Informational Text)

Key Ideas and Details	
11-12R1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly/implicitly and make logical inferences, including determining where the text is ambiguous; develop questions for deeper understanding and for further exploration. (RI&RL)
11-12R2	Determine two or more themes or central ideas in a text and analyze their development, including how they emerge and are shaped and refined by specific details; objectively and accurately summarize a complex text. (RI&RL)
11-12R3	In literary texts, analyze the impact of author's choices. (RL) In informational texts, analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop. (RI)
Craft and Structure	
11-12R4	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings. Analyze the impact of specific word choices on meaning, tone, and mood, including words with multiple meanings. Analyze how an author uses and refines the meaning of technical or key term(s) over the course of a text. (RI&RL)
11-12R5	In literary texts, analyze how varied aspects of structure create meaning and affect the reader. (RL) In informational texts, analyze the impact and evaluate the effect structure has on exposition or argument in terms of clarity, persuasive/rhetorical technique, and audience appeal. (RI)
11-12R6	Analyze how authors employ point of view, perspective, and purpose, to shape explicit and implicit messages (e.g., persuasiveness, aesthetic quality, satire, sarcasm, irony, or understatement). (RI&RL)
Integration of Knowledge and Ideas	
11-12R7	In literary texts, analyze multiple adaptations of a source text as presented in different formats (e.g., works of art, graphic novels, music, film, etc.), specifically evaluating how each version interprets the source. (RL) In informational texts, integrate and evaluate sources on the same topic or argument in order to address a question, or solve a problem. (RI)
11-12R8	Delineate and evaluate an argument in applicable texts, applying a lens (e.g. constitutional principles, logical fallacy, legal reasoning, belief systems, codes of ethics, philosophies, etc.) to assess the validity or fallacy of key arguments, determining whether the supporting evidence is relevant and sufficient. (RI&RL)
11-12R9	Choose and develop criteria in order to evaluate the quality of texts. Make connections to other texts, ideas, cultural perspectives, eras, and personal experiences. (RI&RL)

11th-12th Grade Writing Standards

Text Types and Purposes	
11-12W1	Write arguments to support claims that analyze substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
11-12W2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
11-12W3	Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.
11-12W4	Create a poem, story, play, art work, or other response to a text, author, theme, or personal experience; demonstrate knowledge and understanding of a variety of techniques and genres. Explain connections between the original and the created work.
11-12W5	Draw evidence from literary or informational texts to support analysis, reflection, and research. Apply grade 11/12 Reading standards to both literary and informational text, where applicable.
Research to Build and Present Knowledge	
11-12W6	Conduct research through self-generated question, or solve a problem; narrow or broaden the inquiry when appropriate. Synthesize multiple sources, demonstrating understanding and analysis of the subject under investigation.
11-12W7	Gather relevant information from multiple sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas; avoid plagiarism, overreliance on one source, and follow a standard format for citation.

11th-12th Grade Speaking and Listening

Comprehension and Collaboration	
11-12SL1	Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.
11-12SL2	Integrate multiple sources of information presented in diverse formats (e.g., including visual, quantitative, and oral). Evaluate the credibility and accuracy of each

	source, and note any discrepancies among the data to make informed decisions and solve problems.
11-12SL3	Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric; assess the premises and connections among ideas, diction, and tone.
Presentation of Knowledge and Ideas	
11-12SL4	Present claims, findings, and supporting evidence, conveying a clear and distinct perspective; alternative or opposing perspectives are addressed; organization, development, substance, and style are appropriate to task, purpose, and audience.
11-12SL5	Make strategic use of digital media and/or visual displays in presentations to enhance understanding of findings, reasoning, and evidence, and to add elements of interest to engage the audience.
11-12SL6	Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

11th-12th Grade Language Standards

Conventions of Academic English	
Anchor L1	Demonstrate command of the conventions of academic English grammar and usage when writing or speaking*.
Anchor L2	Demonstrate command of the conventions of academic English capitalization, punctuation, and spelling when writing*
Knowledge of Language	
11-12L3	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
Vocabulary Acquisition and Use	
11-12L4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases, choosing flexibly from a range of strategies.
11-12L5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
11-12L6	Acquire and accurately use general academic and content-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in applying vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Core Conventions Skills for Grades 9-12

- Use parallel structure.
- Use various types of phrases and clauses to add variety and interest to writing or presentations.
- Understand that usage is a matter of convention that can change over time.
- Resolve issues of complex or contested usage, consulting references as needed.

Core Punctuation and Spelling Skills for Grades 9-12

- Use punctuation (commas, parentheses, dashes, hyphens) to clarify and enhance writing.
- Use a semicolon to link two or more closely related independent clauses.
- Use a colon to introduce a list or quotation.

Full Text: New York State Next Generation English Language Arts Learning Standards (nysed.gov)

NYS Literacy Standards: NYS Next Generation 6-12 Literacy Standards in History/Social Studies, Science, and Technical Subjects

Reading Standards for Literacy in Science and Technical Subjects 11-12	
RST 1	Cite specific evidence to support analysis of scientific and technical texts, charts, diagrams, etc. attending to the precise details of the source, and attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
RST 2	Determine the key ideas or conclusions of a source; summarize complex concepts, processes, or information presented in a source by paraphrasing in precise and accurate terms.
RST 3	Analyze how and why scientific ideas and reasoning are developed and modified over the course of a text, source, argument, etc.; analyze/evaluate the results and conclusions based on explanations in the text.
RST 4	Determine the meaning of symbols, key terms, and other content-specific words and phrases as they are used in scientific or technical sources.
RST 5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
RST 6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
RST 7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
RST 8	Evaluate the data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
RST 9	Compare and contrast findings presented in a source to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11-12	
WHST 1	Write arguments focused on discipline-specific content.
WHST 2	Write explanatory and analytical text focused on discipline-specific content and which uses strategies for conveying information like those used in the respective discipline.
WHST 3	Write narratives to understand an event or topic, appropriate to discipline-specific norms, conventions, and tasks.
WHST 4	Write responses to texts and to events (past and present), ideas, and theories that include personal, cultural, and thematic connections.
WHST 5	Conduct short as well as more sustained research projects to answer a question (including a self-generated question), analyze a topic, or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
WHST 6	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience as well as by applying discipline-specific criteria used in the social sciences or sciences; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
WHST 7	Draw evidence from informational texts to support analysis, reflection, and research.

Full Text: New York State Next Generation Learning Standards for Literacy in History/Social Studies, Science and Technical Subjects (nysed.gov)

New York State Next Generation Mathematics Learning Standards

Full Text: New York State Next Generation Mathematics Learning Standards