

Syracuse City School District
Career & Technical Education Programs
Course Syllabus
CNT 100: Construction Trades Technology 100



Construction Trades Program Overview:

At the completion of this program, students will understand and be able to apply the trade skills necessary for entry-level employment, apprenticeships and post-secondary education. Units of study include 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. The program includes theory and authentic hands-on, project-based activities. Students will earn a math and ELA credit upon successful program completion. Students will also have the opportunity to earn the National Center for Construction Education and Research (NCCER) Construction Core and OSHA 10 certifications, recognized throughout the construction industry as indicators that the applicant is “job ready.”

Course Description:

Level 100 Construction Trades provides basic technical knowledge and safety skills to begin preparing for a career in the field. Topics include safety, construction math and measurement, project estimating, hand and power tool identification and use, construction drawings, materials handling and processing and construction rigging. Communication and customer service are also covered.

Course Objectives:

1. Implement key safety procedures while working on a construction site.
2. Pass the OSHA 10 Safety Certification exam.
3. Possess the knowledge and skill to safely and accurately use hand and power tools in construction projects.
4. Apply basic math to calculate measurements in construction activities.
5. Read and interpret building plans to access information necessary to complete construction projects.
6. Demonstrate an understanding of the working properties of materials used on a construction site.
7. Accurately handle and process various construction materials.

District Requirements:

- Students qualify for Occupational Safety and Health Administration (OSHA) 10-hour course at the successful completion of the Construction 100 Safety module.
- Students qualify to take the NCCER Core exam after Construction 100 at the end of 9th grade.
- Students will earn integrated science credit upon successful Completion of Construction 100, 200, and 300.
- Students will have earned 12th grade ELA credit upon successful completion of Construction 100, 200, 300 and 400.
- Students will receive the CTE Endorsement upon successful completion of the Building Construction Skills program and achieving a passing score on the NCCER Core Technical Assessment.

Integrated Academics: N/A

Student Equipment and Supplies

- **School will provide:** All necessary lab materials and classroom equipment
- **Student will provide:** A notebook for taking and saving notes; pen/pencils.

Additional Course Policies

Students are required to follow all classroom and lab conduct and safety procedures.

Textbooks:

- NCCER Core Curriculum: Introductory Craft Skills (Pearson) 4th edition
- NCCER Tools for Success: Critical Skills for the Construction Industry (Pearson) 3rd edition

Grading:

- Module classwork: 30%
- End of Module assessment: 30%
- Project work: 20%
- Participation: 20%

Academic Calendar:

Quarter	Units of Study
1	<ul style="list-style-type: none">• Construction safety and OSHA 10 certification.• Construction Math measurement and materials estimates.• Construction related health, safety and environmental management.
2	<ul style="list-style-type: none">• Hand tool use and safety.• Power tool use and safety.• Wood working projects.
3	<ul style="list-style-type: none">• Construction drawings.• Architectural software applications.• Shed construction.• Resumes, cover letters, and personal profiles.
4	<ul style="list-style-type: none">• Introduction to basic equipment rigging.• Device design and constructions for gaining a mechanical advantage.• Materials processing and handling.



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	Related Standards	CCLS Literacy, Math, Science
Weeks 1-4 Basic Safety	<ul style="list-style-type: none"> • What does safety look like in building and construction trades? • What is the role and responsibility of workers in maintaining a safe work environment? • Why is a safe work site valued by the Construction Industry? • 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 MSDS? 	<ul style="list-style-type: none"> • Understand the importance of health, safety, and environmental management systems in organizations • Read and understand manufacturer's materials safety data sheets • Identify and interpret universal signs and symbols to ensure safety at job sites • Describe the importance of compliance with safety standards and explain how it effects overall production in an organization • Compliance with all organizational safety policies and procedures 	<ul style="list-style-type: none"> • Student research on industry safety standards and the economic impacts of job-related accidents/injuries • Completion of 10-Hour OSHA Safety Training • OSHA 10 Exam • NCCER Basic Safety Module Assessment 	Career Ready Practice CRP 2, 7, 11 Cluster Standards AC 3 Pathway Standards AC-CST 5 AC-DES 2 AC-MO 1 Industry Standards	Literacy RST.9-10.1,4,7, 10 ELA RI.9-10.4 Math S-ID.1,2,3,4,5,6 Science
	Week 5 Safety Projects:	<ul style="list-style-type: none"> • What are some common construction/building site hazards/dangers to workers? • How can you identify safety hazards in different construction-related situations? • What steps should you take in assessing and correcting unsafe working conditions? • How can good communication skills facilitate worker safety? 	<ul style="list-style-type: none"> • Identify types and sources of workplace hazards common to various construction settings • Identify universal signs/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 	<ul style="list-style-type: none"> • Identification of workplace hazards in various settings and safety measures to prevent accidents & injuries • Statistics on the cost of accidents to businesses • Research projects: Construction-related lost time accidents and associated costs to companies, including penalties, sanctions by OSHA • Safety posters. 	Career Ready Practice CRP 1, 2, 4, 12 Cluster Standards AC 3 Pathway Standards AC-CST 5, AC-DES 2 AC-MO 1 Industry Standards

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 6-7 Communication Skills – Skills for Success Module	<ul style="list-style-type: none"> Why are written and verbal communication skills important at the construction work place? What types of written and verbal communication are commonly used at work sites? What are differences in communication between co-workers and between supervisors and workers? What strategies could you use to improve your communication skills, especially when under stress at the job? 	<ul style="list-style-type: none"> Communicate in the language of the construction industry Develop effective verbal communication skills for successful employment Write personal and technical communications Recognize the significance of effective communication skills as they relate to successful interpersonal, working relationships Analyze personal communication style and explore strategies to improve/enhance skills 	<ul style="list-style-type: none"> Situational role plays Case scenarios Guest speaker from HR Student research on communication and customer service skills NCCER Module Assessment 	Career Ready Practice CRP 1, 4	Literacy WHST.9-10.7 ELA RI.9-10.1,4 SL.9-10.1
				Pathway Standards AC-CST 5	Science
				Industry Standards	
Weeks 8-9 Employability Skills	<ul style="list-style-type: none"> What are “employability skills”? 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? How can you best prepare for a job interview? 	<ul style="list-style-type: none"> Identify roles, responsibilities and personal characteristics by researching workplace/job site information Demonstrate responsibility, teamwork, respect and professionalism in the classroom and shop Work with peers and supervisors to problem solve and collectively accomplish tasks 	<ul style="list-style-type: none"> Field trip to construction company Guest speakers for interview preparation Student mock interviews with individuals from industry NCCER Module Assessment precedents 	Career Ready Practice CRP 1, 4, 7, 9, 11	Literacy WHST.9-10.7
				Pathway Standards AC-CST 1, 6 AC-DES 2, 5 AC-MO 2	Math
				Industry Standards	Science

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science				
Weeks 10-13 Construction Math	<ul style="list-style-type: none"> 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? 	<ul style="list-style-type: none"> Applying basic measurement functions Use basic math functions to complete jobsite/ workplace tasks Apply formulas to determine ratios, fractions, and proportion measures Determine correct math application for specific construction-related scenarios Use appropriate formulas to determine percentages /decimals Use mathematical formulas to determine area and volume of various structures 	<ul style="list-style-type: none"> Measurement worksheets and applications – square feet, cubic feet, etc. Solving math problems in specific scenarios requiring the selection and application of appropriate formulas NCCER Module Assessment 	Career Ready Practice CRP 2 Cluster Standards AC 1 Pathway Standards AC-DES 8 Industry Standards	Literacy RST.9-10.7 ELA Math G-CO.1.5 G-SRT.6,8 G-GPE.5,7 G-MG.1,3 Science				
				Week 14 Construction Math Project:	<ul style="list-style-type: none"> What skills do you need 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? What are the working conditions, job opportunities and average wages for roofers? 	<ul style="list-style-type: none"> Identification and application of concepts/ processes used in calculating materials estimates Estimate resources & materials required for a specific project or problem Communications: Use oral and written communication skills in creating, expressing and interpreting information and ideas, including technical terms and information 	<ul style="list-style-type: none"> Using trade-related vocabulary, students will type a project description Students will compete with each other for the most accurate and cost effective roofing estimate that meets client wants and needs Students will research education, wages and responsibilities of roofers in construction jobs Guest speakers will share roofing job descriptions, hourly wages and education requirements 	Career Ready Practice CRP 2, 4, 6 Cluster Standards AC 1, 2 Pathway Standards AC-DES 2, 8 Industry Standards	Literacy RST.9-10.2,4 WHST.9-10.1,2 ELA SL.9-10.1
								Roofing Estimates & Concrete Pad Estimates	<ul style="list-style-type: none"> What are the basic hand tools used in building and construction trades?

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science		
Safety	<ul style="list-style-type: none"> What is the function of each tool? What are the correct techniques to successfully utilize each respective tool? What safety considerations apply to the use of the respective hand tools? What is PPE and how does it relate to hand tool use? 	<ul style="list-style-type: none"> function of hand tools Understand the importance of selecting the “right tool(s)” for specific tasks Use basic hand tools in compliance with all safety standards Understand the importance of tool maintenance and safety Analyze and describe the effects of unsafe tool applications for workers 	<ul style="list-style-type: none"> Students will apply skills on selected tools, complying with all prescribed safety regulations Guest speaker from the industry NCCER Module Assessment 	<ul style="list-style-type: none"> Cluster Standards AC 1 Pathway Standards AC-CST 8, 9 AC-MO 2, 4, 5 Industry Standards 	<ul style="list-style-type: none"> ELA RI.9-10.4 Math G-MG.3 S-ID.1,2,3,4,5,6 Science 		
	Weeks 18-19 Hand Tool Project	<ul style="list-style-type: none"> How can you use basic hand tools to solve a problem? How do you select the appropriate tools for specific projects or jobs? Why is safety in hand tool use important? 	<ul style="list-style-type: none"> Selection of and justification for using specific tools to solve a problem or complete a task/project Demonstration of safe tool use to complete tasks 	<ul style="list-style-type: none"> Lab practical on tool identification Students will type a technical description of the project/problem Student and teacher designed projects; rubric evaluation 	<ul style="list-style-type: none"> Career Ready Practice CRP 2, 4, 5, 6, 8, 11 Cluster Standards AC 1 Pathway Standards AC-CST 8, 9 AC-MO 2, 4, 5 Industry Standards 	<ul style="list-style-type: none"> Literacy RST.9-10.1,2,4 WHST.9-10.1,2 ELA RI.9-10.4 W.9-10.2,4,6 Math G-MG 3 S-ID.1,2,3,4,5,6 Science 	
		Weeks 20-22 Power Tools and Safety	<ul style="list-style-type: none"> What are the basic power tools used in building and construction trades? What is the function of each respective power tool? What safety rules apply to each of the power tools? What PPE should be used for power tools? How can you identify potential safety issues in the use of power tools? 	<ul style="list-style-type: none"> Use and maintain appropriate tools, machinery, equipment, and resources to accomplish project goals Apply safety protocols as prescribed for each covered power tool Analyze potential safety issues and make recommendations for their prevention 	<ul style="list-style-type: none"> Lab practical on tool identification Quiz on power tools and safety requirements Shop observations of power tool use NCCER Module Assessment 	<ul style="list-style-type: none"> Career Ready Practice CRP 2, 11, 12 Cluster Standards AC 1 Pathway Standards AC-CST 8, 9 AC-MO 2, 4, 5 Industry Standards 	<ul style="list-style-type: none"> Literacy RST.9-10.1,2,4 ELA RI.9-10.4 Math G-MG.3 S-ID.1,2,3,4,5,6 Science
			Weeks 23-24	<ul style="list-style-type: none"> How can you use basic 	<ul style="list-style-type: none"> Student developed 	<ul style="list-style-type: none"> Technical writing 	<ul style="list-style-type: none"> Career Ready Practice

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Power Tool Projects	<ul style="list-style-type: none"> power tools to solve a problem? How do you identify the correct power tool for a job? Why are safety checks and PPE so important when working with power tools? 	description of problems/projects to be completed, using the vocabulary of the industry <ul style="list-style-type: none"> Selection and demonstration of proper tool use for project completion in compliance with all safety rules 	assignment describing the selected project <ul style="list-style-type: none"> Student and teacher designed projects- rubric evaluated Lab practical in tool identification and use 	CRP 2, 11, 12 Cluster Standards AC 1	7.8 RST.9-10.1-4 ELA W.9-10.2,4,6
				Pathway Standards AC-CST 8, 9 AC-MO 2, 4, 5 Industry Standards	Math G-MG.3 S-ID.1,2,3,4,5,6
				Career Ready Practice CRP 2, 4	Literacy RST.9-10.1,3,4 ELA
				Cluster Standards AC 1, 6	Math G-CO.9,12,13 G-SRT.1 G-MG.3 N-Q.3
Weeks 25-27 Construction Drawings	<ul style="list-style-type: none"> What are construction drawings? How are project building requirements communicated? How do industry standards effect construction drawings? Why must plans follow industry standards while they are being created? 	<ul style="list-style-type: none"> Read, interpret, and use technical drawings, documents, and specifications to plan a project Recognize how specifications and standards are arranged for proper access 	<ul style="list-style-type: none"> Guest Speaker: Architect Field trip to King & King Individual student drawings NCCER Module Assessment 	Pathway Standards AC-DES 2, 6, 7 Industry Standards	Science
				Career Ready Practice CRP 2, 4, 11	Literacy RST.9-10.1,2,3,4,7 ELA RI.9-10.4
Weeks 28-29 Construction Drawing Project:	<ul style="list-style-type: none"> 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/architectural drawings? How do basic skills in Computer-Aided Design (CAD) assist you in better understanding the process of creating suitable building plans? 	<ul style="list-style-type: none"> Use architect's plan, manufacturer's illustrations and other materials to communicate specific data and visualize proposed work Understand and apply computer software to develop building/construction plans 	<ul style="list-style-type: none"> Building plans submitted and assessed for adherence to building plan standards Student created building plans using Autodesk Revit Architecture software 	Cluster Standards AC 1, 6 Pathway Standards AC-DES 2, 6, 7 Industry Standards	Math G-SRT.6,8 G-CO.2,6 G-GPE.6,7 Science
				Math G-SRT.6,8 G-CO.2,6 G-GPE.6,7	
				Pathway Standards AC-DES 2, 6, 7	Science
				Industry Standards	

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science		
Weeks 30-31 Basic Construction Equipment Rigging	<ul style="list-style-type: none"> • What is construction equipment rigging? • How is it used in the industry? • Why is it important to discern how to safely move large, heavy loads? • What role does verbal and written communication play in working with peers and customers? 	<ul style="list-style-type: none"> • Apply principles of physics as they relate to worksite/job site situations in working with materials and load applications • Apply basic concepts of statics and loads to planning • Develop technical writing skills in the language of the profession • Articulate the appropriate equipment for a specific construction problem/job 	<ul style="list-style-type: none"> • Student worksheets • Guest speaker/lecturer from JPW • Construction site field trip • Lab projects: Select and demonstrate the use of appropriate rigging equipment for specific job • Analyze & articulate basic rigging concepts & processes to peers and supervisors • NCCER Module Assessment 	Career Ready Practice CRP 2, 4, 8, 11 Cluster Standards AC 1 Pathway Standards AC-CST 5, 8, 9 Industry Standards	Literacy WHST.9-10.5 ELA SL.9-10.1,4 Math N-Q.1,2,3 G-CO.9 G-MG.1,2,3 Science		
	Week 32 Construction Materials Processing and Handling	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • Identify the physical properties present when using common construction materials in order to handle the materials safely, effectively and efficiently • Apply concepts of material handling based on physical properties 	<ul style="list-style-type: none"> • Assignments identifying materials and determining physical properties of each • Assign appropriate processing and handling, based on physical properties • NCCER Module Assessment 	Career Ready Practice CRP 2, 4, 8 Cluster Standards AC 1, 2, 3 Pathway Standards AC-CST 5 Industry Standards	Literacy WHST.9-10.8,9 ELA Math G-GMD.4 Science	
		Week 33 Materials rigging and handling project:	<ul style="list-style-type: none"> • How can mechanical advantage be used to move a heavy load? • What are 5 considerations involved in pre-task planning? • How would you determine the best lifting or moving aid for a specific material? 	<ul style="list-style-type: none"> • Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate) 	<ul style="list-style-type: none"> • Students will design and develop a tool that will provide mechanical advantage in moving a load-rubric evaluated 	Career Ready Practice CRP 2, 4, 8 Cluster Standards AC 1, 2, 3 Pathway Standards AC-CST 5 Industry Standards	Literacy WHST.9-10.9 ELA Math G-GMG.1, 2, 3 Science

Syracuse City School District
Career & Technical Education Programs
Course Syllabus
CNT 200: Construction Trades Technology 200



Construction Trades Program Overview:

At the completion of this program, students will understand and be able to apply the trade skills necessary for entry-level employment, apprenticeships and post-secondary education. Units of study include 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. The program includes theory and authentic hands-on, project-based activities. Students will earn a math and ELA credit upon successful program completion. Students will also have the opportunity to earn the National Center for Construction Education and Research (NCCER) Construction Core and OSHA 10 certifications, recognized throughout the construction industry as indicators that the applicant is “job ready.”

Course Description

Construction Trades 200 builds on the knowledge and skills learned in Construction Trades 100. Students will learn the basic skills necessary to work in concrete, masonry and carpentry. Tools and materials for the three skill areas will be learned and practiced in a project based learning environment to gain hands on experience. Learning to form and pour concrete sidewalks, block and stone retaining walls, and building a small utility shed are examples of the practical work that will be accomplished in Construction Trades 200.

Course Objectives

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. Understand and 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.

District Requirements

- Students qualify for Occupational Safety and Health Administration (OSHA) 10-hour course at the successful completion of the Construction 100 Safety module.
- Students qualify to take the NCCER Core exam after Construction 100 at the end of 9th grade.

- Students will receive the CTE Endorsement upon successful completion of the Construction Technology program and achieving a passing score on the NCCER Core Technical Assessment.

Integrated Academics

N/A

Student Equipment and Supplies

- **School will provide:** All necessary lab materials and classroom equipment
- **Student will provide:** A notebook for taking and saving notes; pen/pencils.

Textbook

- NCCER Core Curriculum: Introductory Craft Skills (Pearson) 4th edition
- NCCER Tools for Success: Critical Skills for the Construction Industry (Pearson) 3rd edition

Grading

30%	Unit & Classwork
30%	End of Unit Assessment
20%	Project Work
20%	End of Course Practical

Additional Course Policies

Students are required to follow all classroom professionalism and safety procedures. Please review class policies.

Academic Calendar

Quarter	Units of Study
1	<ul style="list-style-type: none"> • Safety requirements in concrete work tools and equipment. • Site layout. • Construction Math measurement and materials estimates. • Construction related health, safety and environmental management.
2	<ul style="list-style-type: none"> • Concrete layouts, footings and foundations. • Forming and placing concrete. • Foundation systems and structural design.
3	<ul style="list-style-type: none"> • Construction drawings. • Architectural software applications. • Shed construction. • Resumes, cover letters, and personal profiles.
4	<ul style="list-style-type: none"> • Intermediate Carpentry building skills: • Planning, laying out, and construction of wall systems. • Planning, laying out, and construction of roof systems.

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



Time Frame Unit of Study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 1-2 Introduction to Concrete Tools & Equipment & Safety in Concrete Work	<ul style="list-style-type: none"> • What are the specific safety concerns that you should be aware of while working with concrete? • What is MSDS? • What sort of Personal Protection Equipment (PPE) is vital to have when working with Concrete? • How should you care for and maintain concrete hand tools when you have finished using them? 	<ul style="list-style-type: none"> • Identify concrete tools and utilize in compliance with safety standards • Read and interpret manufacturer product safety data • Identify common concrete equipment and determine the appropriate equipment for each application at a construction site • Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments 	<ul style="list-style-type: none"> • Group projects: Student developed safety posters, based on manufacturer's instructions, product MSDS and OSHA regulations • Campus-based project: Identify and use tools for projects and appropriately care for and maintain the tool inventory at the end of the project • Module Assessment 	Career Ready Practice CRP 1, 2, 5, 12 Cluster Standards AC 1, 3 Pathway Standards AC-CST 5 AC-MO 1 Industry Standards	Literacy Standards RO.9-10.1,4 RST.9-10.1,4 WHST.9-10.2,8,9 ELA SL.9-10.1 Math Standards Science Standards
Weeks 3-5 Introduction to Concrete Construction and Finishes	<ul style="list-style-type: none"> • What is Portland cement and how is it made? • What are the aggregates that are used to make concrete? • What are two advantages where using additives in concrete improves the quality of the material? • How do climate and soil conditions effect concrete construction? 	<ul style="list-style-type: none"> • Distinguish/differentiate types of concrete and their components • Discuss the value of additives in concrete applications • Apply mathematical formulas to determine areas and volumes of various structures • Select tools, machinery, equipment, and resources that match 	<ul style="list-style-type: none"> • Student research and group presentations on concrete products and their uses and on concrete finishes • Application of related construction vocabulary • Concrete projects • Module assessments 	Career Ready Practice CRP 1, 2, 4, 12 Cluster Standards AC 1, 3 Pathway Standards AC-CST 5, 8, 9 AC-DES 8 AC-MO 1	Literacy Standards RST.9-10.1,4 WHST.9-10.2 ELA RI.9-10.4,7 SL.9-10.1,4 Math Standards G-GMD.1,3

	<ul style="list-style-type: none"> What does steel reinforcement bar do to the strength of concrete in a building system? 	<ul style="list-style-type: none"> Apply the principles of reinforcement bar in concrete jobs Use data and measurements to solve a problem Apply scientific methods in problem identification, qualitative and quantitative analysis, data gathering, direct and indirect observation and predictions 		<ul style="list-style-type: none"> Research local, state and national regulatory bodies that govern building codes Document the components and procedures required for specific project approvals Apply math measurement, square footage, volume Campus-based projects Module Assessment 	Industry Standards	Science Standards
Weeks 6-10	<ul style="list-style-type: none"> What is the function of foundations? Why is it vital that the footings and foundation of a structure be absolutely level and square? 	<ul style="list-style-type: none"> Interpret drawings used in project planning Discuss the purpose of foundations in project layouts Analyze the effects of footings and foundations that are not level and square Identify governmental regulations and national, state and/or local building codes that apply to a given workplace/job/site 	<ul style="list-style-type: none"> Research local, state and national regulatory bodies that govern building codes Document the components and procedures required for specific project approvals Apply math measurement, square footage, volume Campus-based projects Module Assessment 	<ul style="list-style-type: none"> Research local, state and national regulatory bodies that govern building codes Document the components and procedures required for specific project approvals Apply math measurement, square footage, volume Campus-based projects Module Assessment 	Career Ready Practice CRP 2, 12 Cluster Standards AC 1, 6 Pathway Standards AC-CST 1, 2, 3, 5, 8 Industry Standards	Literacy Standards RST.9-10.1,3,4 WHST.9-10.2,4,6 ELA RI.9-10.1 Math Standards G-MG.1,3 G-GMD.4 G-GPE.5,6 G-CO.1,11,12 Science Standards
Weeks 11-15	<ul style="list-style-type: none"> What are the key differences between pre-cast and cast-in-place concrete? Why is form work typically built by carpenters and not masons? 	<ul style="list-style-type: none"> Distinguish the differences between pre-cast and cast-in-place concrete Describe the advantages & disadvantages of each type Estimate resources/materials required for a specific project or problem 	<ul style="list-style-type: none"> Student Assignment: Detailed project description for a specific job, using the language of the trade Student job estimate assignment Campus-based projects Field trip to concrete fabricator Campus-based project Module assessment 	<ul style="list-style-type: none"> Student Assignment: Detailed project description for a specific job, using the language of the trade Student job estimate assignment Campus-based projects Field trip to concrete fabricator Campus-based project Module assessment 	Career Ready Practice CRP 2, 12 Cluster Standards AC 1, 2, 3, 5, 6 Pathway Standards AC-CST 5, 6, 9 AC-DES 2, 8 Industry Standards	Literacy Standards RST.9-10.3,9 WHST.9-10.2,4 ELA SL.9-10.3 Math Standards G-MG.3 G-C.3, 5 G-CO.1,11,12 Science Standards
Weeks 16-20	<ul style="list-style-type: none"> How do you calculate the number of "yards" of 	<ul style="list-style-type: none"> Use algebraic formulas to determine areas and 	<ul style="list-style-type: none"> Application of math to specific jobs/projects 	<ul style="list-style-type: none"> Application of math to specific jobs/projects 	Career Ready Practice CRP 2, 8, 12	Literacy Standards RST.9-10.1,3

Placing Concrete	concrete that are required to complete a job?	volumes of various structures	• Correct application of math formulas for project development	Cluster Standards AC 1, 2, 3,	ELA		
	• What are the tools and materials used to successfully pour concrete?	• Perform calculations for determining the number of “yards” of concrete for a specific job	• Campus-based project			Pathway Standards AC-CST 5, 6, 9 AC-DES 2, 8	Math Standards G-MG.2 G-CO.11
	• Why is it so important that concrete be aeriated as it is being poured?	• Select tools, machinery, equipment, and resources that match requirements of the job	• Module assessment			Industry Standards	Science Standards
Weeks 21-24	• What are the major concrete masonry units (CMU) used in construction? • What is the purpose of the foundation system in structural design and construction? • Why is the “Leaning Tower of Pisa leaning?”	• Examine building systems and components to evaluate their usefulness to a project • Incorporate appropriate building systems into a construction project	• Student research on industrial structures, i.e., bridges, buildings that have failed and analyze the causes and compare structures that have sustained over the years • Campus-based project • Module assessment	Career Ready Practice CRP 2, 8	Literacy Standards RST.9-10.1,4 WHST.9-10.1,2,4,6		
Introduction to Masonry	• What is the purpose of the wood framed floor system in building construction? • What are the key components of a floor system? • How does the carpenter determine the sizes of lumber he/she should use in 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 governmental regulations and national, state and/or local building codes that apply to a given workplace/jobsite	• Student Presentations: • Project planning assignment, including a project description, building systems, materials estimate, labor estimate, approval procedures, and timeline for project completion • Correct application of floor system vocabulary • Correct application of math formulas for projects • Student floor system applications • Module assessment and campus based project	Cluster Standards AC 1, 3	ELA RI.9-10.1 SL.9-10.1,3,4		
				Pathway Standards AC-CST 5, 8, 9 AC-DES 8 AC-MO 1	Math Standards G-MG.3 G-CO.1		
				Industry Standards	Science Standards		
Weeks 25-30	• What is the purpose of the wood framed floor system in building construction? • What are the key components of a floor system? • How does the carpenter determine the sizes of lumber he/she should use in 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 governmental regulations and national, state and/or local building codes that apply to a given workplace/jobsite	• Student Presentations: • Project planning assignment, including a project description, building systems, materials estimate, labor estimate, approval procedures, and timeline for project completion • Correct application of floor system vocabulary • Correct application of math formulas for projects • Student floor system applications • Module assessment and campus based project	Career Ready Practice CRP 1, 2, 8	Literacy Standards RST.9-10.1,3,10 WHST.9-10.4,7		
Introduction to Carpentry Floor Systems	• How is the wall system integral to an energy efficient building envelope? • What do headers do and	• Identify building systems needed to complete a construction project • Read, interpret, and use technical drawings,	• Application of knowledge and skills in the use of technical drawings • Wall system measurements and	Cluster Standards AC 1, 3	ELA RI.9-10.1,10 RST.9-10.1,3,4		
				Career Ready Practice CRP 2, 8, 11, 12	Literacy Standards		
				Cluster Standards AC 1, 3			
Weeks 31-33	• How is the wall system integral to an energy efficient building envelope? • What do headers do and	• Identify building systems needed to complete a construction project • Read, interpret, and use technical drawings,	• Application of knowledge and skills in the use of technical drawings • Wall system measurements and	Career Ready Practice CRP 2, 8, 11, 12	Literacy Standards RI.9-10.1,10 RST.9-10.1,3,4		
Wall Systems	• How is the wall system integral to an energy efficient building envelope? • What do headers do and	• Identify building systems needed to complete a construction project • Read, interpret, and use technical drawings,	• Application of knowledge and skills in the use of technical drawings • Wall system measurements and	Career Ready Practice CRP 2, 8, 11, 12	Literacy Standards RI.9-10.1,10 RST.9-10.1,3,4		

	<ul style="list-style-type: none"> Why are they so important? What does 16" on center mean and why is it important to carefully lay out walls with framing studs 16 inches on center? 	<ul style="list-style-type: none"> documents, and specifications to plan a project Identify governmental regulations and national, state and/or local building codes that apply to a given workplace/jobsite 	<ul style="list-style-type: none"> construction Campus based project Module Assessment 	<ul style="list-style-type: none"> Group research on assigned roof systems in various climates and the rational for different systems, including materials used, construction processes and governmental regulations/building codes Math applications for materials, squares, pitch Student constructed roof Module Assessment 	<ul style="list-style-type: none"> Individual research projects on chosen career paths Student completed resumes, cover letters and applications End of course Practical Assessments 	<ul style="list-style-type: none"> Pathway Standards AC-CST 5, 8, 9 AC-DES 8 AC-MO 1 Industry Standards 	<ul style="list-style-type: none"> Math Standards G-MG.3 G-GMD.4 G-GPE.6 G-CO.1 Science Standards
Weeks 34-38	<ul style="list-style-type: none"> Why are weather and climate key factors in determining sound roof systems? What is the difference between a roof rafter and roof truss design in roofing systems? What does pitch mean in roof design? 	<ul style="list-style-type: none"> Identify building systems needed to complete a construction project Read, interpret, and use technical drawings, documents, and specifications to plan a project Apply related vocabulary Identify governmental regulations and national, state and/or local building codes that apply 				<ul style="list-style-type: none"> Career Ready Practice CRP 1, 2, 5, 8, 12 Cluster Standards AC 1, 3 Pathway Standards AC-CST 5, 8, 9 AC-DES 8 AC-MO 1 Industry Standards 	<ul style="list-style-type: none"> Literacy Standards RST.9-10.1,4 WHST.9-10.2 ELA RI.9-10.1 SL.9-10.1 Math Standards G-GPE.5 G-MG.3 G-CO.1,7,8,10 Science Standards
Weeks 39-40	<ul style="list-style-type: none"> How could applying the design process be useful in solving a particular building need? 	<ul style="list-style-type: none"> Complete required training, education, and certification to prepare for employment in a particular career field Create and implement project plans considering available resources and requirements of a project or problem in order to accomplish realistic planning in design and construction situations 				<ul style="list-style-type: none"> Career Ready Practice CRP 2, 8, 10 Cluster Standards AC 7 Pathway Standards AC-CST 5, 8, 9 AC-DES 4, 8 Industry Standards 	<ul style="list-style-type: none"> Literacy Standards RST.9-10.1,4 WHST.9-10.2,4,6 ELA RI.9-10.1,4 Math Standards Science Standards
Construction 200 Final Practical Assessment							

Syracuse City School District
Career & Technical Education Programs
Course Syllabus
CNT 300: Construction Trades Technology 300



Construction Trades Program Overview:

At the completion of this program, students will understand and be able to apply the trade skills necessary for entry-level employment, apprenticeships and post-secondary education. Units of study include 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. The program includes theory and authentic hands-on, project-based activities. Students will earn a math and ELA credit upon successful program completion. Students will also have the opportunity to earn the National Center for Construction Education and Research (NCCER) Construction Core and OSHA 10 certifications, recognized throughout the construction industry as indicators that the applicant is “job ready.”

Course Description:

Construction 300 continues to expand knowledge and skills learned in the 100 and 200 levels. Students in this course will learn skills necessary to work safely in plumbing, electrical, building envelope, and green building. Tools and materials for the four skill areas will be learned in a project-based learning environment. Examples of project work include learning to plumb a bathroom, wiring a room with lights and receptacles, designing and creating an energy efficient wall system, experimenting with alternative energy models, including energy conservation.

Course Objectives:

By the end of Construction 300 students will be able to:

1. Demonstrate skill with plumbing tools, equipment and materials in the application basic plumbing activities.
2. Understand and 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.

Integrated Academics:

At the completion of Construction Trades 300, students will receive one integrated math credit.

Equipment and Supplies:**School will provide:** Tools and resources needed to complete all units and exams.**Student will provide:** A notebook for note taking; pen/pencils, attire suitable for construction work.**Textbook:**

- NCCER Construction Technology Trainee Guide (Pearson/Prentice Hall) 3rd edition
- NCCER Your Role in the Green Environment (Pearson) 1st edition

Grading:

- Attendance/participation 10%
- Unit Classwork: 20%
- End of Unit Assessment: 20%
- Project Work: 30%
- Final Exam 20%

Academic Calendar:

Quarter	Units of Study
1	<ul style="list-style-type: none"> • Careers in plumbing • Plumbing theory, safety and practice • Plumbing tools and materials • Plumbing skills application
2	<ul style="list-style-type: none"> • Careers in electrical trades • Electrical trade theory, safety and practice • Electrical tools and materials • Basic skills in wiring and electrical component installation
3	<ul style="list-style-type: none"> • Careers in green building and building envelope system design • Components of efficient building envelope systems • Calculating energy efficiency • Introduction to Green building design • Sustainable design practices • LEED Certification
4	<ul style="list-style-type: none"> • Introduction to basic equipment rigging • Device design and constructions for gaining a mechanical advantage • Materials handling and processing

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



Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science		
Weeks 1-2 Introduction to the Plumbing Profession	<ul style="list-style-type: none"> • 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? • Do you need a certification or license? • What personal attributes are important for success in the trade? • What is the working environment like for plumbers? • What might the career ladder look like in the trade? 	<ul style="list-style-type: none"> • Articulate the education and training levels for the trade • Discuss the skills and personal attributes necessary for success in the profession • Offer the rationale for licensing/certification in the trade • Determine the pros and cons of a career in the trade • Assess their personal attributes and compare/contrast to those required of the profession • Discuss potential levels in the profession's career ladder 	<ul style="list-style-type: none"> • Individual research on the profession and construct short papers on their findings, including regulatory bodies, and professional affiliations • Group presentations on selected plumbing topics, including graphic representations • Effective use of trade related vocabulary 	Career Ready Practice CRP 1, 4, 7, 12 Cluster Standards AC 1, 4, 7 Pathway Standards Industry Standards	Literacy RST.11-12.1,4 WHST.11.12.2 ELA RI.11-12.4,7 W.11-12.1,2,4,6 SL.11-12.1,4 Math Science		
	Weeks 3-5 Plumbing Safety	<ul style="list-style-type: none"> • What specific safety concerns should you be aware of when installing plumbing? • What are the building codes for plumbing? • What are the key reasons for plumbing codes? • Why is adhering to building codes important when "roughing in plumbing"? • Who enforces the 	<ul style="list-style-type: none"> • Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments • Discuss the reason for standardized plumbing codes and describe the penalties to contractors for noncompliance • Cite reasons for accidents and discuss why they 	<ul style="list-style-type: none"> • Analyze the rationale behind plumbing safety considerations • Interpret safety signs and hazard symbols • Research economic impact of lost time accidents • Compliance with all safety rules, including PPE • Project work • Unit Assessment 	Career Ready Practice CRP 2, 4, 5 Cluster Standards AC 1, 3 Pathway Standards AC-CST 5, 9	Literacy RST.11-12.4,5,7 WHST.11.12.2 ELA RI.11-12.4,7 SL.11-12.1,4 Math GMD.A.2,3 Science	

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
	<ul style="list-style-type: none"> plumbing codes? What is lockout/tagout? What is meant by confined space safety? What are common accidents and reasons for them? What are the costs to employers, employees and society for plumbing accidents? 	<ul style="list-style-type: none"> often occur Discuss who bears the costs of accidents at each level: Contractors, their employees, society Create and apply a jobsite safety program to ensure compliance with safe practices and procedures 		Industry Standards	
Weeks 6-7 Tools of the Plumbing Trade	<ul style="list-style-type: none"> What is the vocabulary used in the plumbing field? What are the common hand tools are used in plumbing? What are the common power tools used in the profession? 	<ul style="list-style-type: none"> Use and maintain appropriate tools, machinery, equipment, and resources to accomplish project goals Implement tool use in compliance with all safety regulations 	<ul style="list-style-type: none"> Word walls, bulletin boards Demonstrate effective use of hand and power tools to complete a task or project Assigned project work Unit Assessment 	Career Ready Practice CRP 1, 2, 5 Cluster Standards AC 1, 3 Pathway Standards AC-CST 5, 9 Industry Standards	Literacy RST.11-12.1,4 WHST.11-12.6 ELA RI.11-12.4 Math Science
Weeks 8-9 Plastic Pipe and Fittings	<ul style="list-style-type: none"> When should plastic pipe be used in plumbing application? What are the different types of plastic pipes and fittings? How should you measure and cut plastic pipe? Do plumbing codes apply to plastic pipe use? How strong does a plastic pipe need to be? How can two sections of plastic pipe be joined? What are the advantages and disadvantages of using plastic pipe over metal (Copper, galvanized and cast Iron)? 	<ul style="list-style-type: none"> Determine the appropriate type of plastic pipes and fittings for a given situation Discuss the inherent properties of ABS, PVC, CPVE, PE, PEX and PB piping Accurately measure and cut plastic pipe for a specific task Distinguish advantages and disadvantages of plastic vs metal pipes 	<ul style="list-style-type: none"> Accurately apply plumbing vocabulary to describe and complete tasks Given a specific project, distinguish the appropriate type of pipe for the application Apply appropriate math formulas for calculating measurements Assigned projects Unit Assessment 	Career Ready Practice CRP 2, 8 Cluster Standards AC 1, 2, 3 Pathway Standards AC-CST 3, 7, 8 Industry Standards	Literacy RST.11-12.1,4 WHST.11.12.2,4, 7,9 ELA SL.11-12.1,4 Math MG.A.3 Science

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 10-12 Copper Pipe and Fittings	<ul style="list-style-type: none"> • What properties of copper make it a suitable material for plumbing pipes and fittings? • How are valves used in copper pipe systems? • What method is used for cutting copper pipe? • How is copper pipe joined? • Why has the composition of solder changed over the years? • How is insulation used with copper pipes? • What codes apply to the use of copper pipes? 	<ul style="list-style-type: none"> • Discuss the inherent properties of copper pipe • Demonstrate safe use of copper pipe in completing tasks • Measure cut and join copper pipe in assigned projects • Discuss the composition of solder as it relates to joining copper pipes • Determine when to insulate copper piping in various settings/situations • Use MSDS (Material Safety Data Sheets) information for the management, use and disposal of materials 	<ul style="list-style-type: none"> • Field trip to plumbers union • Accurate use of trade-related vocabulary • Interpretation of selected products MSDS sheets • Evaluation of assigned projects • Unit Assessment 	Career Ready Practice CRP 2, 4, 8	Literacy RST.11-12.1,3,4,9 WHST.11.12.2
				Cluster Standards AC 1, 2, 3	ELA SL.11-12.1,3
				Pathway Standards AC-CST 5, 9	Math M.G.A.3
				Industry Standards	Science
Weeks 13-14 Orientation to the Electrical Trade	<ul style="list-style-type: none"> • What are the career paths for electrical workers? • What are the career specific requirements to become a qualified electrician? • What is the IBEW? • What sort of working environment do electricians typically work in? 	<ul style="list-style-type: none"> • Explore career to develop an understanding of available employment opportunities • Examine how the roles and responsibilities among the trades/professions work in conjunction to complete a project/job • Discuss various work environments for electrical workers 	<ul style="list-style-type: none"> • Field visit to IBEW • Panel Discussion with selected electricians on employment expectations • Unit Assessment 	Career Ready Practice CRP 1, 4, 10	Literacy RST.11-12.7,9 WHST.11.12.2
				Cluster Standards AC 1, 7	ELA SL.11-12.1,3,4,6,7
				Pathway Standards AC-CST 5	Math
				Industry Standards	Science
Weeks 15-17 Electrical Safety	<ul style="list-style-type: none"> • What are the specific safety considerations to be aware of before and during the installation of electrical systems at a construction site? • Who determines safety standards for electricians? 	<ul style="list-style-type: none"> • Describe OSHA's role in electrical worker safety • Discuss standard electrical precautions and hazards found at a job site • Develop and apply a jobsite safety program to ensure safe practices and 	<ul style="list-style-type: none"> • Compliance with all safety precautions in assigned projects • Interpret standard safety and hazard symbols related to electrical workers • Unit Assessment 	Career Ready Practice CRP 1, 2, 4, 12	Literacy RST.11-12.1,3,4,6,7,9 WHST.11.12.1,2,4,6,7
				Cluster Standards AC-CST 5, 9	ELA SL.11-12.1,4

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 18-20 Intro to Electrical Circuits	<ul style="list-style-type: none"> • What is Ohm's law? • What is resistance? • How is math used in electric power equations? • What are series circuits? • What is a branch circuit? • What is a GFCI? • Why is it important to know what the load on a circuit will be before you design and install the circuit? 	<ul style="list-style-type: none"> • Understand and apply Ohm's law concepts to assigned tasks • Apply appropriate math formulas in solve electrical problems • Identify different types of circuits in electrical applications • Accurately calculate load in the design and installation of a circuit 	<ul style="list-style-type: none"> • Effective communication of information to solve an electrical problem • Evaluation of assigned labs • Unit Assessment 	Career Ready Practice CRP 2	Literacy RST.11-12.1,2,3,4 WHST.11.12.2,4,9
				Cluster Standards AC 1, 3, 6	ELA SL.11-12.1,4
				Pathway Standards	Math A-CED.A.4
				Industry Standards	Science
Weeks 21 & 22 Electrical Theory	<ul style="list-style-type: none"> • How is Ohm's law applied to the practice of installing electrical systems? • What is voltage? • What does NEC stand for? • What are NEC tables and how do electricians use them? 	<ul style="list-style-type: none"> • Analyze the way electrical installations are impacted by Ohm's Law • Discuss the rationale for the development and use of NEC codes • Apply NEC codes using prescribed procedures 	<ul style="list-style-type: none"> • Guest lecturer from IBEW • Evaluation of student work sheets, quizzes and homework assignments • Project work • Unit Assessment 	Career Ready Practice CRP 2, 4, 10	Literacy RST.11-12.1,3,4 WHST.11.12.2,4, 6 ELA SL.11-12.1
Cluster Standards AC 1, 2, 5, 7	Math CED.A.1				
Pathway Standards AC-CST 5	Science				
Weeks 23 & 24 Electrical Project	<ul style="list-style-type: none"> • If there were a need for the installation of a residential electrical system, how would you approach meeting this need? 	<ul style="list-style-type: none"> • Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate) 	<ul style="list-style-type: none"> • Communicate methods used in solving an electrical problem • Students/teacher design rubric for 	Career Ready Practice CRP 2, 4, 6, 8	Literacy RST.11-12.3,4 WHST.11.12.2 ELA SL.11-12.1

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 25-28 Introduction to Building Envelope Systems	<ul style="list-style-type: none"> • What does "building envelope" mean? • What factors are considered in improving a building's energy efficiency? • How might you substantiate each of these factors – what is the rationale behind determining these factors? • What sequence of steps should be taken to determine a building's energy efficiency? 	<ul style="list-style-type: none"> • Communicate the concepts of "building envelope verbally and in writing • Apply the skills and concepts used in energy audits • Describe audit process and results to consumers • Apply principles of sealing, heat loss, and insulating materials to energy efficiency 	<ul style="list-style-type: none"> • Student shadows to weatherization companies • Lab practice applying weatherization techniques to improve energy efficiency • Unit Assessment 	Career Ready Practice CRP 2, 4, 8	Literacy RST.11-12.2.4 WHST.11.12.2 ELA SL.11-12.1 Math GMD.A.2,3
				Pathway Standards AC-CST 3, 8 Industry Standards	Science
Weeks 29-34 Your Role in the Green Environment	<ul style="list-style-type: none"> • What does the phrase "green environment" represent to you? • What does sustainability mean? • What are alternative energy sources? • How are buildings rated in terms of "green"? • What does LEED stand for? • How does conservation and "building small" factor into the green 	<ul style="list-style-type: none"> • Discuss the benefits of renewable energy sources • Describe standards for green building design and construction • Discuss advantages /disadvantages of alternative energy sources • Define LEED and cite the process for LEED certification 	<ul style="list-style-type: none"> • Group projects and presentations on alternative energy and sustainability • Field trip to SUNY ESF • Field trip to Architectural firm and green building contractors • Lab projects • Unit Assessment 	Career Ready Practice CRP 1, 2, 5, 8, 12	Literacy RST.11-12.2.4 ELA SL.11-12.1,4 Math M.G.A.3
				Cluster Standards AC 1, 3, 4, Pathway Standards AC-CST 1, 7 AC-DES 1, 3, 4, 8	Science

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
<p>Weeks 35-40</p> <p>Capstone project</p>	<p>environment?</p> <ul style="list-style-type: none"> • What sorts of organizational systems should you employ when starting a large project? • How could you encourage effective team work in your group while completing your capstone project? • In what ways you can convey your knowledge and learning of building construction beyond your project? 	<ul style="list-style-type: none"> • Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice • Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate). • Employ planning and time management skills and tools to enhance results and complete work tasks. 	<ul style="list-style-type: none"> • Students/teacher design rubric for Capstone Project assessment. 	<p>Industry Standards</p> <p>Career Ready Practice CRP 1, 2, 4, 8, 9, 11, 12</p> <p>Cluster Standards AC 1, 2, 3, 4, 5, 6</p> <p>Pathway Standards AC-CST 1, 2, 3, 4, 5, 6 AC-DES 1, 2, 3, 4, 6, 7</p> <p>Industry Standards</p>	<p>Literacy RST.11-12.1,2,4</p> <p>ELA SL.11-12.1,4</p> <p>Math MG.A.3</p> <p>Science</p>

Syracuse City School District
Career & Technical Education Programs
Course Syllabus
CNT 400: Construction Trades Technology 400



Construction Trades Program Overview:

At the completion of this program, students will understand and be able to apply the trade skills necessary for entry-level employment, apprenticeships and post-secondary education. Units of study include 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. The program includes theory and authentic hands-on, project-based activities. Students will earn a math and ELA credit upon successful program completion. Students will also have the opportunity to earn the National Center for Construction Education and Research (NCCER) Construction Core and OSHA 10 certifications, recognized throughout the construction industry as indicators that the applicant is “job ready.”

Course Description:

Construction 400 takes student knowledge and skills to greater depths by providing opportunities for additional project-based activities and work-based learning experiences. Students will practice work safety in all aspects of the construction trades while enhancing skills. Level 400 also integrates job readiness practices, including effective verbal and written communication, critical thinking and problem solving, resume, cover letter, job interview and follow up activities.

Course Objectives:

By the end of Construction 400 students will be able to:

1. Demonstrate practices and behaviors consistent with employer expectations.
2. Apply effective communication and relationship management skills with supervisors, peers and customers as necessary for sustained employment in the construction field.
3. Communicate with employers and worksite supervisors in the technical language of the profession.
4. Complete all project-based activities in compliance with local building codes and regulations.
5. Perform all work activities in compliance with OSHA safety regulations.
6. Understand how various construction-related career areas interconnect during the various phases of building projects.
7. Apply the concepts of building envelope systems and weatherization techniques.
8. Apply concepts of green building and alternative energy practices to construction projects.
9. Use math formulas for accurate measurements and performing estimates for construction projects.

Integrated Academics:

At the completion of Construction Trades 300, students will receive one integrated math credit

Equipment and Supplies:**School will provide:** Tools and resources needed to complete all units and exams.**Student will provide:** A notebook for note taking; pen/pencils, attire suitable for construction work.**Textbook:**

- NCCER Construction Technology Trainee Guide (Pearson/Prentice Hall) 3rd edition
- NCCER Your Role in the Green Environment (Pearson) 1st edition

Grading:

- Attendance/participation 10%
- Unit Classwork: 20%
- End of Unit Assessment: 20%
- Project Work: 30%
- Final Exam 20%

Academic Calendar:

Quarter	Units of Study
1	<ul style="list-style-type: none"> • Careers in plumbing • Plumbing theory, safety and practice • Plumbing tools and materials • Plumbing skills application
2	<ul style="list-style-type: none"> • Careers in electrical trades • Electrical trade theory, safety and practice • Electrical tools and materials • Basic skills in wiring and electrical component installation
3	<ul style="list-style-type: none"> • Careers in green building and building envelope system design • Components of efficient building envelope systems • Calculating energy efficiency • Introduction to Green building design • Sustainable design practices • LEED Certification
4	<ul style="list-style-type: none"> • Introduction to basic equipment rigging • Device design and constructions for gaining a mechanical advantage • Materials handling and processing

Syracuse City School District
Career and Technical Education Program
Scope and Sequence
CNT 400: Construction Trades Level 400



Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 1-4 Classroom/Shop/ Internship Expectations & Safety Review (Including OSHA) Building Codes and Standards Review of Orientation to the Trade Site Layout- Differential Leveling	<ul style="list-style-type: none"> • What career opportunities can you expect in carpentry/construction? • How should you prepare for a career interview? • How important is worker safety in construction trades? • What equipment and methods are used in differential leveling? 	<ul style="list-style-type: none"> • Identify career opportunities and training levels for carpentry and construction workers • Apply principles and methods in differential site leveling accurately • operate equipment • Discuss responsibilities of surveyors, field engineers and carpenters in differential leveling 	<ul style="list-style-type: none"> • Group research on career opportunities • Guest speakers on career areas, work environments, employer expectations and required education-interactive • Differential leveling projects • Use Monster.com to develop career interview questions • Student scheduled career interview • Typed interview reports for presentation to Construction 100 students 	Career Ready Practice CRP1,2,7,9,10 Cluster Standards AC1,2,4,5,6,7 Pathway Standards AC-CST1,2,4,5,6,8,9 Industry Standards	Literacy RST.11-12.T2,4 WHS.11-12.T2,5 ELA R.11-12.4 W.11-12.2,6 SL.11-12.1,2 Math G-MG.1,3 G-GMD.4 G-GPE.5,6 G-CO.1,11,12 Science
Weeks 5-6 Foundations and Slab-on-Grade	<ul style="list-style-type: none"> • How are safety, tools and forms different in this application? • Where are these applications used? • What safety and building code regulations should be considered 	<ul style="list-style-type: none"> • Identify and describe tools and methods in foundation and slab-on-grade projects • Distinguish appropriate type based on site layout • Identify related codes and safety regulations in a construction project 	<ul style="list-style-type: none"> • Rubric graded projects 	Career Ready Practice CRP1,3,4 Cluster Standards AC1,2,5,6 Pathway Standards AC-CST9 Industry Standards	Literacy RST11.11-12.4 ELA R.11-12.4 SL.11-12.1,2 Math G-MG.2 G-CO.11 Science
Weeks 7-10 Resume and Cover Letter Development	<ul style="list-style-type: none"> • What kinds of information should be included in a résumé? • What is the function of a 	<ul style="list-style-type: none"> • Identify appropriate responsibilities and personal characteristics by researching 	<ul style="list-style-type: none"> • Student developed resumes and cover letters for employment (Industry partner to provide 	Career Ready Practice CRP 1,2,4,7,8,9,10,11	Literacy WHST.11-12.2

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Researching and Interpreting Job Postings Email Correspondence with an Industry Partner Building Projects Applying Blueprints	cover letter and what are its key elements? • How should a professional email correspondence look? • Can you apply what you've learned about construction drawings to a project?	workplace/jobsite information • Identify the essential elements of the resume and cover letter • Understand the job application • Design and construct a project based on student developed drawings	feedback on student resumes and cover letters) Rubric Rated • Industry speakers • Completed shop projects	Cluster Standards AC1,5	ELA R.11-12.4 W.11-12.2,6 SL.11-12.1,2
				Weeks 11-14 Communicating Technical Skills to Site Supervisors and Coworkers Floor Installation and Finishing Project Stair Layout Projects	• What does communication with site supervisors and coworkers sound like/look like? • When should you ask for help at your internship or job? • How will you decide which floor finish to use at a construction job?
Weeks 18-20 Wall Systems and Application Projects	• What have you learned about wall framing, including window and door openings? • How should the walls be supported? • What information will you need before you complete your materials estimate? • How do you keep the	• Apply construction concepts to wall framing project • Follow procedures for door and window openings • Select and utilize materials, tools and methods for wall construction, including bracing and corner	• Completed materials list • Submission of materials estimate for wall project • Completed group wall projects		
				Pathway Standards AC-CST1,5,9 AC-DES2,3,6	Career Ready Practice CRP 1,2,4,6,7,8,9,10,11,12
Pathway Standards AC-CST1,5,9 AC-DES2,3,6	Cluster Standards AC1,2,3,6	Industry Standards	Pathway Standards AC-CST1,5,9 AC-DES2,3,6		

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
Weeks 21-24 Drywall Installation and Finishing Job Readiness Practices	<ul style="list-style-type: none"> What information is needed to install and finish drywall? Where is drywall used and how many different types of gypsum are used? Why are technical skills and soft skills (Career Ready Practices) both important in construction trades? 	<ul style="list-style-type: none"> Identify and explain drywall types and uses, fasteners and installation methods Select materials/tools and finish installed drywall Cite examples for the 12 Career Ready Practices Apply effective communication skills with employers and peers 	<ul style="list-style-type: none"> Accurately measure, cut, and install drywall Practice finish techniques Research job listings for class discussions Read, write and speak in the language of the profession 	Industry Standards	Science
				Career Ready Practice CRP 1,2,4,5,7,9,10,11 Cluster Standards AC1,2,3,6 Pathway Standards AC-CST5,6,9 AC-DES2,3,6 Industry Standards	Literacy RST11.11-12.4 WHST.11-12.2,3 ELA R.11-12.4 W.11-12.2,6 SL.11-12.1,2 Math G-MG.3 G-GMD.4 G-GPE.6 G-CO.1 Science
Weeks 25-27 Internships Completing Job Applications Roof Framing and Applications Projects	<ul style="list-style-type: none"> How does climate effect the type of roofing materials? How will you determine which methods and materials should be used for a specific job? How do you determine roof pitch? 	<ul style="list-style-type: none"> Plan and construct a roof Use correct tools, materials and procedures for selected jobs Calculate correct pitch 	<ul style="list-style-type: none"> Pitch calculation Materials estimate Group project-roofing application 	Career Ready Practice CRP 1-12 Cluster Standards AC1-5,7 Pathway Standards AC-CST4,5,9 Industry Standards	Literacy RST.11-12.2,4 WHST.11-12.2,3 ELA R.11-12.4 W.11-12.2,6 SL.11-12.1,2 Math G-CO.1,5 G-SRT.6,8 G-GPE.5,7 G-MG.1,3 Science
Weeks 28-30	<ul style="list-style-type: none"> What questions should 	<ul style="list-style-type: none"> Successfully participate in 	<ul style="list-style-type: none"> Develop appropriate 	Career Ready	Literacy

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science
<p>Mock Employment Interviews</p> <p>Exterior Finishing Applications</p> <p>Internships</p>	<p>you expect in a job interview?</p> <ul style="list-style-type: none"> How should you follow up after a job interview? Why is the correct exterior finish an important part of a construction project? What are the local building codes? 	<ul style="list-style-type: none"> a professional interview Accept interview feedback and adjust communication, etc., as needed Define and apply moisture barriers and insulation Install a variety of sidings Determine type and install flashing material Compare and contrast siding applications, including characteristics, advantages and disadvantages 	<p>questions and participate in interview with advisory committee members</p> <ul style="list-style-type: none"> Research and written summaries on siding applications Completed installation of exterior applications 	<p>Practice CRP 1,2,3,4,5,6,7,8,9,11,12</p> <p>Cluster Standards AC1-5,7</p> <p>Pathway Standards AC-CST4,5,9 AC-DES2,3,8</p> <p>Industry Standards</p>	<p>RST.11-12.2,4 WHST.11-12.2,3</p> <p>ELA R.11-12.4 W.11-12.2,6 SL.11-12.1,2</p> <p>Math G-MG.3</p> <p>Science</p>
<p>Weeks 31-32</p> <p>Legal and Ethical Practices in the Trades</p> <p>Final Project Research and Proposals</p> <p>Internships End</p>	<ul style="list-style-type: none"> Can you predict what will occur as a result of illegal/unethical practices? How will the projects be selected and what should they include? How will they be graded? What resources will you need to complete an independent project and presentation? 	<ul style="list-style-type: none"> Research construction projects Select appropriate resources for project completion Meet timelines for project activities Develop proposal for independent student project 	<ul style="list-style-type: none"> Position paper arguing or defending a legal or ethical situation Article critique on current legal/ethical scenarios Submit first proposal draft Progress checks 	<p>Career Ready Practice CRP 1-12</p> <p>Cluster Standards AC1,2,5,7</p> <p>Pathway Standards AC-CST4,5,9 AC-DES1,9</p> <p>Industry Standards</p>	<p>Literacy RST.11-12.2,4 WHST.11-12.2,3</p> <p>ELA R.11-12.4 W.11-12.2,6 SL.11-12.1,2</p> <p>Math</p> <p>Science</p>
<p>Week 33</p> <p>Project Proposal Resubmissions</p>	<ul style="list-style-type: none"> What changes need to be made for resubmission? 	<ul style="list-style-type: none"> Understand proposal feedback and edit as required Submit final proposals by predetermined deadline 	<ul style="list-style-type: none"> Final proposals for independent student projects 	<p>Career Ready Practice CRP 1,2,3,4,5,6,8,9,11,12</p> <p>Cluster Standards AC1</p> <p>Pathway Standards AC-CST4,9</p>	<p>Literacy RST.11-12.2,4 WHST.11-12.2,3</p> <p>ELA R.11-12.4 W.11-12.6</p> <p>Math</p>

Time Frame Unit of study	Key Questions	Key Learning Targets (Students will know and be able to)	Assessment Evidence of Learning	Related Standards	CCLS Literacy, Math, Science	
Weeks 34-38 Individual Student Project Work Finalize Portfolios	<ul style="list-style-type: none"> • What are the best resources for your independent project? • What help will you need organizing and completing your project? 	<ul style="list-style-type: none"> • Plan, organize and develop independent projects • Locate resources to support project work • Organize portfolio documents for presentation to a professional panel 	<ul style="list-style-type: none"> • Project and portfolio progress checks 	Industry Standards	Literacy RST.11-12.2,4 WHST.11-12.2,3 ELA R.11-12.4 W.11-12.6 Math	
				Career Ready Practice CRP 1,2,4,5,6,7,8,9,11 Cluster Standards AC1		Pathway Standards AC-CST4,9
				Science		
Weeks 39-40 Final Project Presentations to Professional Panel	<ul style="list-style-type: none"> • How can you develop an informative presentation? • What key elements make up effective speeches? • What do you need to know about your target audience and why is it important? 	<ul style="list-style-type: none"> • Develop independent project presentations • Present to a professional audience 	<ul style="list-style-type: none"> • Practice speeches • Progress checks • Present to peers and professional panel 	Career Ready Practice CRP 1,2,4,6,7,8,9,11 Cluster Standards AC1	Literacy RST.11-12.2,4 WHST.11-12.2,3 ELA R.11-12.4 W.11-12.6 Math	
				Pathway Standards AC-CST4,9	Science	
				Industry Standards		