Maryland CTE Programs of Study

Core Construction Principles (2025)

GENERAL REQUIREMENTS. This course is recommended for students in Grades 9-12. 1

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INTRODUCTION 2

A Career and Technical Education (CTE) instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. 2.A

B The Construction Career Cluster prepares students for careers in designing, planning, and building sustainable infrastructure. This field includes architects, engineers, construction managers, and skilled trades professionals. 2.B

C The Carpentry program prepares students for careers in residential, commercial, and industrial Carpentry systems. Through a comprehensive curriculum aligned with industry standards, students develop foundational construction skills and specialized Carpentry knowledge while earning industry-recognized certifications. The program emphasizes hands-on learning, safety protocols, and real-world applications, preparing graduates for immediate entry into the Carpentry or related trades. 2.C

D Core Construction Principles introduces students to the essential fundamentals of the construction industry with a focus on Carpentry systems career preparation. This foundational course aligns with NCCER Core certification and OSHA safety standards, emphasizing construction safety, basic math operations, hand and power tool operations, blueprint reading, and material handling. Students develop critical workplace skills through modules covering communication, employability skills, and construction drawings. 2.D

E Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, which might include informational interviews or job shadowing relevant to the program of study. 2.E

F Students are encouraged to participate in extended learning experiences through ligned Career and Technical Student Organizations (CTSOs). CTSOs are a

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cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland. 2.F

KNOWLEDGE AND SKILLS 3

A The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to: 3.A

1. Identify and demonstrate positive work behaviors that enhance employability and job advancement, such as regular attendance, promptness, proper attire, maintenance of a clean and safe work environment, and pride in work. 3.A.1
2. Demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, active listening, and a willingness to learn. 3.A.2
3. Employ effective reading, writing, and technical documentation skills. 3.A.3
4. Solve problems using critical thinking techniques and structured troubleshooting methodologies. 3.A.4
5. Demonstrate leadership skills and collaborate effectively as a team member. 3.A.5
6. Implement safety procedures, including proper handling of hardware and following OSHA guidelines. 3.A.6
7. Exhibit an understanding of legal and ethical responsibilities in the construction field, following applicable laws and best practices for safety. 3.A.7
8. Demonstrate time-management skills and the ability to prioritize tasks in a technical setting. 3.A.8

B The student identifies various career pathways in the Carpentry field. The student is expected to: 3.B

1. Develop a career plan that includes the necessary education, certifications, job skills, and experience for specific roles as a Carpenter or in the Carpentry field. 3.B.1
2. Create a professional resume and portfolio that reflects skills, projects, certifications, and recommendations. 3.B.2
3. Demonstrate effective interview skills for roles in the Carpentry field. 3.B.3

C The student identifies the issues associated with Carpentry hazards found on a jobsite. The student is expected to: 3.C

1. Demonstrate safe working procedures in a construction environment. 3.C.1
2. Explain the purpose of the Occupational Safety and Health Administration (OSHA) and how it promotes safety on the job. 3.C.2
3. Identify Carpentry related hazards and how to avoid or minimize them in the workplace. 3.C.3
4. Explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection. 3.C.4

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D **The student integrates core academic skills into Carpentry construction practices. The student is expected to:** 3.D

1. Demonstrate the use of clear communication techniques, both written and verbal, that are consistent with industry standards. 3.D.1
2. Apply fundamental measurement concepts including fractions, decimals, and metric conversions - skills essential for accurate construction work. Students will apply geometric principles when calculating areas, perimeters, and volumes of basic shapes, which is crucial for material estimation. The use of basic algebra for board feet calculations or concrete volume may exist. Construction math fundamentals like reading tape measures, calculating angles, and applying the Pythagorean theorem are essential building blocks introduced in this course. 3.D.2
3. Use several fundamental physics concepts, particularly in the study of basic hand and power tools. Students can learn about simple machines (levers, wedges, inclined planes) and mechanical advantage when using tools like crowbars, hammers, and jacks. Material science concepts emerge when studying properties of common construction materials - understanding concepts like tensile strength, compression, shear forces, and load distribution. 3.D.3

E **The student demonstrates understanding of construction industry fundamentals and career opportunities. The student is expected to:** 3.E

1. Analyze the current state and key career fields within Carpentry related careers. 3.E.1
2. Evaluate the benefits and opportunities available in a construction career. 3.E.2
3. outline the typical career progression path for craft professionals. 3.E.3
4. Develop a plan to pursue a career in the Carpentry field. 3.E.4

F **The student implements construction safety protocols and procedures. The student is expected to:** 3.F

1. Analyze workplace incidents, associated costs, and methods to reduce hazards. 3.F.1
2. Demonstrate proper fall protection techniques and hazard prevention methods. 3.F.2
3. Identify and mitigate struck-by, caught-in-between, and common job-site hazards. 3.F.3
4. Evaluate Carpentry related hazards and implement appropriate safety measures. 3.F.4
5. Select and utilize appropriate personal protective equipment (PPE) for specific hazards. 3.F.5

G **The student applies mathematical principles in construction contexts. The student is expected to:** 3.G

1. Solve basic arithmetic problems using whole numbers. 3.G.1
2. Calculate measurements and dimensions using fractions. 3.G.2

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3 Solve construction-related math problems with precision. 3.G.3

4 Measure lengths accurately using common measuring tools. 3.G.4

5 Convert between units of measurement in both imperial and metric systems. 3.G.5

6 Calculate areas and volumes of common geometric shapes. 3.G.6

H The student demonstrates proper use and maintenance of hand tools. The student is expected to: 3.H

1 Identify and safely operate common hand tools. 3.H.1

2 Select and utilize appropriate measurement and layout tools. 3.H.2

3 Maintain and properly store hand tools common to construction sites. 3.H.3

I The student demonstrates safe and proper use of power tools. The student is expected to: 3.I

1 Identify the tool most appropriate for the job to be performed. 3.I.1

2 Operate industry related tools safely and effectively. 3.I.2

3 Perform maintenance on related industry tools. 3.I.3

4 Demonstrate appropriate storage and safety techniques when tools are not in use. 3.I.4

J The student interprets construction drawings and specifications. The student is expected to: 3.J

1 Identify basic components and features of construction drawings, schematics, and diagrams. 3.J.1

2 Differentiate between various types of construction drawings. 3.J.2

K The student develops effective workplace communication skills. The student is expected to: 3.K

1 Demonstrate effective verbal and non-verbal communication in construction settings. 3.K.1

2 Apply reading and writing skills to construction-related tasks. 3.K.2

L The student develops professional workplace behaviors and skills. The student is expected to: 3.L

1 Understand the importance of consistent attendance, punctuality, and professional communication. 3.L.1

2 Evaluate construction business opportunities and workforce entry strategies. 3.L.2

3 Apply critical thinking skills to solve workplace problems. 3.L.3

4 Demonstrate appropriate social skills in professional settings to include customer service interactions that communicate the problem, potential solutions, and create positive customer experiences. 3.L.4

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M **The student implements proper material handling techniques. The student is expected to:** 3.M

1 Identify and explain specific uses for different industry related materials. 3.M.1

2 Apply safety precautions in material handling operations. 3.M.2

4 Select and operate appropriate material handling equipment. 3.M.4