SPRING GROVE AREA SCHOOL DISTRICT

PLANNED COURSE OVERVIEW

Course Title: Pre-Apprenticeship Class/Commercial and Industrial Trades	**Length of Course:** 30 Cycles
Grade Level(s): 11-12	**Periods Per Cycle:** 6
Units of Credit: 1	**Length of Period:** 43 minutes
Classification: Elective	**Total Instructional Time:** 129 hours

Course Description

This course provides students with the opportunity to experience the first class in the National Center for Construction Education & Research (NCCER) Apprenticeship Program. The pre-apprenticeship program will prepare students how to safely work and communicate on an industrial job site. Topics in the curriculum include: Basic Safety, Communication Skills, Introduction to Construction Drawings, and Job Site Math. Successful completion of this class allows students to continue their education/career aspirations in commercial and industrial trade. Course completion is equivalent to the first six months of the NCCER Apprenticeship Program. Course credit is transferrable to any Associated Builders & Contractors (ABC) Chapter in the USA.

Instructional Strategies, Learning Practices, Activities, and Experiences

Teacher Demonstration Online Tutorials/Resources Critical Thinking	Posted Objectives and Agenda Formal Assessments Guided Practice	Bell Ringer Class Discussion Flexible Groups

Assessments

Hands-On Skill Test Quizzes Module Exams	Projects Labs Constructed Response Articles	

Materials/Resources

National Center for Construction Education and Research Core Curriculum textbook	Occupational Safety and Health Administration - 10 (OSHA) Construction Safety Course	Articulation Agreement with ABC Keystone to transfer credits to their apprenticeship program

Adopted: 5/24/21
Revised:

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
Basic Safety NCCER MODULE 00101 **Industry Certifications:** With successful completion of this content and exams, students will earn the OSHA-10 Construction Safety Card, an industry recognized standard for safety on commercial & industrial worksites When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Explain the idea of a safety culture and its importance in the construction crafts. Identify causes of accidents and the impact of accident costs. Explain the role of OSHA in job-site safety. Explain OSHA's General Duty Clause and 1926 CFR Subpart C. Recognize hazard recognition and risk assessment techniques. Explain fall protection, ladder, stair, and scaffold procedures and requirements. Identify struck-by hazards and demonstrate safe working procedures and requirements. Identify caught-in-between hazards and demonstrate safe working procedures and requirements. Define safe work procedures to use around electrical hazards. Demonstrate the use and care of appropriate personal protective equipment (PPE). Explain the importance of hazard communications (HazCom) and Material Safety Data Sheets (MSDSs). Identify other construction hazards on your job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires. **PA State Standards:** **3.4.12.A1** - Compare and contrast the rate of technological development over time. **3.4.10.A2** - Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems. **3.4.12.A3** - Demonstrate how technological progress promotes the advancement of science, technology, engineering, and mathematics (STEM). **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.E7** - Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency. **3.4.10.B4** - Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention. **13.2.11.E** - Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: Commitment, Communication, Dependability, Health/safety, Laws and regulations (Americans With Disabilities Act, child labor laws, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), Personal initiative, Self-advocacy, Scheduling/time management, Team building, Technical literacy, and Technology.

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Introduction to Construction Math NCCER MODULE 00102 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Add, subtract, multiply, and divide whole numbers, with and without a calculator. Use a standard ruler, a metric ruler, and a measuring tape to measure. Add, subtract, multiply, and divide fractions. Add, subtract, multiply, and divide decimals, with and without a calculator. Convert decimals to percentages and percentages to decimals. Convert fractions to decimals and decimals to fractions. Explain what the metric system is and how it is important in the construction trade. Recognize and use metric units of length, weight, volume, and temperature. Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them. **PA State Standards:** **CC.2.1.HS.F.2** - Apply properties of rational and irrational numbers to solve real world or mathematical problems. **CC.2.1.7.D.1** - Analyze proportional relationships and use them to model and solve real-world and mathematical problems. **CC.2.1.8.E.4** - Estimate irrational numbers by comparing them to rational numbers. **CC.2.1.HS.F.4** - Use units as a way to understand problems and to guide the solution of multi-step problems. **CC.2.2.HS.D.2** - Write expressions in equivalent forms to solve problems. **CC.2.2.HS.D.9** - Use reasoning to solve equations and justify the solution method.

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Introduction to Hand tools NCCER MODULE 00103 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives**: Recognize and identify some of the basic hand tools and their proper uses in the construction trade. Visually inspect hand tools to determine if they are safe to use. Safely use hand tools. **PA State Standards:** **3.4.12.A2** - Describe how management is the process of planning, organizing, and controlling work. **3.4.12.B1** - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies. **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.C2** - Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments. **3.4.10.E4** - Evaluate the purpose and effectiveness of information and communication systems. **3.4.12.E7** - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

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Introduction to Power tools NCCER MODULE 00104 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Identify power tools commonly used in the construction trades. Use power tools safely. Explain how to maintain power tools properly. **PA State Standards:** **3.4.12.A2** - Describe how management is the process of planning, organizing, and controlling work. **3.4.12.B1** - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies. **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.C2** - Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments. **3.4.10.E4** - Evaluate the purpose and effectiveness of information and communication systems. **3.4.12.E7** - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

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Introduction to Construction Drawings NCCER MODULE 00105 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Recognize and identify basic construction drawing terms, components, and symbols. Relate information on construction drawings to actual locations on the print. Recognize different classifications of construction drawings. Interpret and use drawing dimensions. **PA State Standards:** **3.4.12.A2** - Describe how management is the process of planning, organizing, and controlling work. **3.4.12.B1** - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies. **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.C2** - Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments. **3.4.10.E4** - Evaluate the purpose and effectiveness of information and communication systems. **3.4.12.E7** - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

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Basic Rigging NCCER MODULE 00106 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Identify and describe the use of slings and common rigging hardware. Describe basic inspection techniques and rejection criteria used for slings and hardware. Describe basic hitch configurations and their proper connections. Describe basic load-handling safety practices. Demonstrate proper use of American National Standards Institute (ANSI) hand signals. **PA State Standards:** **3.4.12.A2** - Describe how management is the process of planning, organizing, and controlling work. **3.4.12.B1** - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies. **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.E4** - Evaluate the purpose and effectiveness of information and communication systems.

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Basic Communication Skills NCCER MODULE 00107 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Interpret information and instructions presented in both verbal and written form. Communicate effectively in on-the-job situations using verbal and written skills. Communicate effectively on the job using electronic communication devices. **PA State Standards:** **3.4.12.A2** - Describe how management is the process of planning, organizing, and controlling work. **3.4.12.B1** - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies. **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.C2** - Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments. **3.4.12.E4** - Synthesize the effects of information and communication systems and subsystems as an integral part of the development of the Information Age. **3.4.10.E4** - Evaluate the purpose and effectiveness of information and communication systems. **3.4.12.E7** - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

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Basic Employability Skills NCCER MODULE 00108 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Explain the role of an employee in the construction industry. Demonstrate critical thinking skills and the ability to solve problems using those skills. Demonstrate knowledge of computer systems and explain common uses for computers in the construction industry. Define effective relationship skills. Recognize workplace issues such as sexual harassment, stress, and substance abuse. **PA State Standards:** **13.1.11.A** - Relate careers to individual interests, abilities, and aptitudes. **13.1.11.B** - Analyze career options based on personal interests, abilities, aptitudes, achievements, and goals. **13.1.11.C** - Analyze how the changing roles of individuals in the workplace relate to new opportunities within career choices. **13.1.11.D** - Evaluate school-based opportunities for career awareness/preparation, such as, but not limited to: Career days, Career portfolio, Community service, Cooperative education, Graduation/senior project, Internship, Job shadowing, Part-time employment, Registered apprenticeship, School-based enterprise **13.1.11.E** - Justify the selection of a career. **13.1.11.F** - Analyze the relationship between career choices and career preparation opportunities, such as, but not limited to: Associate Degree, Baccalaureate Degree, Certificate/licensure, Entrepreneurship, Immediate part/full time employment, Industry training, Military training, Professional degree, Registered apprenticeship, Tech Prep, Vocational Rehabilitation Centers. **13.1.11.G** - Assess the implementation of the individualized career plan through the ongoing development of the career portfolio. **13.1.11.H** - Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests. **13.3.11.A** - Evaluate personal attitudes and work habits that support career retention and advancement.

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Introduction to Materials Handling NCCER MODULE 00109 **Industry Certifications:** When all module exams are completed according to NCCER standards, the student will earn credit for completing the Core Curriculum in the apprenticeship program at any Associated Builders & Contractors (ABC) Chapter in the USA	**NCCER Objectives:** Define a load. Establish a pre-task plan prior to moving a load. Use proper materials-handling techniques. Choose appropriate materials-handling equipment for the task. Recognize hazards and follow safety procedures required for materials handling. **PA State Standards:** **3.4.12.A1** - Compare and contrast the rate of technological development over time. **3.4.10.A2** - Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems. **3.4.12.A3** - Demonstrate how technological progress promotes the advancement of science, technology, engineering, and mathematics (STEM). **3.4.10.B2** - Demonstrate how humans devise technologies to reduce the negative consequences of other technologies. **3.4.10.E7** - Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency. **3.4.10.B4** - Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention. **13.2.11.E** - Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: Commitment, Communication, Dependability, Health/safety, Laws and regulations (Americans With Disabilities Act, child labor laws, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), Personal initiative, Self-advocacy, Scheduling/time management, Team building, Technical literacy, and Technology.