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Fall 2010

**PROGRAM CONCENTRATION:** Architecture, Construction,  
Communications & Transportation  
**CAREER PATHWAY:** CLIMATE CONTROL SYSTEMS TECHNOLOGY  
**COURSE TITLE:** Occupational Safety and Fundamentals

This course is designed to prepare a student with foundational knowledge and skills for a career in one of two possible construction crafts. It also is a good course for a student to prepare for a variety of opportunities in addition to the craft areas such as; Mechanical Engineering and Construction Management to name a few.

As the student progresses through the course they are given the opportunity to explore two construction craft areas on an introductory level. Once they have completed the foundational and introductory levels they are then given the option to “major” in at least one of the two craft areas. These areas are HVACR and Low Voltage Electrical Upon successful completion of four units within this pathway, in an Industry Accredited Program, the student will earn at least two industry credentials with the possibility of others.

### **Occupational Safety and Fundamentals:**

This course is the foundational course that prepares students for a pursuit of any career in the field of construction. It prepares the trainee for the basic knowledge to function safely on or around a construction site and in the industry in general. It provides the trainee with the option for an Industry Certification in the Construction Core.

This course explains the safety obligations of workers, supervisors, and managers to ensure a safe workplace. Course content discusses the causes and results of accidents and the dangers of rationalizing risks. It includes the basic content of OSHA 10-hour safety standards. It also includes the basic knowledge and skills needed in the following areas: construction math, hand and power tools used in the field, general blueprints, and basics of rigging safety.

### **ACCT -OS-1 Students will understand and practice construction safety.**

- a. Demonstrate knowledge of use and care of PPE.
- b. Demonstrate a basic knowledge of OSHA and its regulations.
- c. Demonstrate a basic knowledge of safety as related to aerial work, electricity, and fire.

### **Academic Standards:**

*MA1P4. Students will make connections among mathematical ideas and to other disciplines.*

- a. *Recognize and use connections among mathematical ideas.*

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- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.*
- c. Recognize and apply mathematics in contexts outside of mathematics.*

*SSCG15. The student will explain the functions of the departments and agencies of the federal bureaucracy.*

- a. Compare and contrast the organization and responsibilities of independent regulatory agencies, government corporations, and executive agencies.*
- b. Explain the functions of the Cabinet.*

*ELA9RC3. The student acquires new vocabulary in each content area and uses it correctly.*

- a. Demonstrates an understanding of contextual vocabulary in various subjects.*
- b. Uses content vocabulary in writing and speaking.*
- c. Explores understanding of new words found in subject area texts.*

**ACCT -OS-2 Students will understand and apply math concepts as applied to construction.**

- a. Demonstrate knowledge and application of measuring.*
- b. Demonstrate ability to apply basic math computations to construction settings.*
- c. Apply basic geometric calculations including the 3-4-5 rule.*
- d. Demonstrate knowledge and application of area and volume calculations.*

**Academic Standards:**

*MA1G1. Students will investigate properties of geometric figures in the coordinate plane.*

- a. Determine the distance between two points.*
- b. Determine the distance between a point and a line.*
- c. Determine the midpoint of a segment.*
- d. Understand the distance formula as an application of the Pythagorean theorem.*

*MM1P1. Students will solve problems (using appropriate technology).*

- a. Build new mathematical knowledge through problem solving.*
- b. Solve problems that arise in mathematics and in other contexts.*
- c. Apply and adapt a variety of appropriate strategies to solve problems.*

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- d. Monitor and reflect on the process of mathematical problem solving.*

*MM1P3. Students will communicate mathematically.*

- a. Organize and consolidate their mathematical thinking through communication.*
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.*
- c. Analyze and evaluate the mathematical thinking and strategies of others.*
- d. Use the language of mathematics to express mathematical ideas precisely.*

*MM1P4. Students will make connections among mathematical ideas and to other disciplines.*

- a. Recognize and use connections among mathematical ideas.*
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.*
- c. Recognize and apply mathematics in contexts outside of mathematics.*

*MM2G1. Students will identify and use special right triangles.*

- a. Determine the lengths of sides of  $30^\circ$ - $60^\circ$ - $90^\circ$  triangles.*
- b. Determine the lengths of sides of  $45^\circ$ - $45^\circ$ - $90^\circ$  triangles.*

*MM2G2. Students will define and apply sine, cosine, and tangent ratios to right triangles.*

- a. Discover the relationship of the trigonometric ratios for similar triangles.*
- b. Explain the relationship between the trigonometric ratios of complementary angles.*
- c. Solve application problems using the trigonometric ratios.*

*MM2A4. Students will solve quadratic equations and inequalities in one variable.*

- c. Analyze the nature of roots using technology and using the discriminant.*

*MM2G3. Students will understand the properties of circles.*

- d. Justify measurements and relationships in circles using geometric and algebraic properties.*

*MM1G1. Students will investigate properties of geometric figures in the coordinate plane.*

- a. Determine the distance between two points.*

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- b. Determine the distance between a point and a line.*
- c. Determine the midpoint of a segment.*
- d. Understand the distance formula as an application of the Pythagorean theorem.*

*ELA9W3. The student uses research and technology to support writing.*

- b. Uses supporting evidence from multiple sources to develop the main ideas within the body of an essay, composition, or technical document.*
- c. Synthesizes information from multiple sources and identifies complexities and discrepancies in the information and the different perspectives found in each medium (i.e., almanacs, microfiche, news sources, in-depth field studies, speeches, journals, or technical documents).*

**ACCT -OS-3 Students will use basic hand and power tools in a professional and safe manner.**

- a. Demonstrate knowledge of rules and regulations regarding the safe use of hand and power tools.
- b. Demonstrate knowledge of the care and maintenance of hand and power tools.
- c. Demonstrate the knowledge of proper usage techniques of hand and power tools.

**Academic Standards:**

*SSCG15. The student will explain the functions of the departments and agencies of the federal bureaucracy.*

- a. Compare and contrast the organization and responsibilities of independent regulatory agencies, government corporations, and executive agencies.*

*ELA9LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

- b. Asks relevant questions.*
- c. Responds to questions with appropriate information.*
- d. Actively solicits another person's comments or opinions.*
- f. Volunteers contributions and responds when directly solicited by teacher or discussion leader.*
- g. Gives reasons in support of opinions expressed.*
- i. Employs group decision-making techniques such as brainstorming or a problem-solving sequence (i.e., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, and evaluates solution).*

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*j. Divides labor to achieve the overall group goal efficiently.*

**ACCT -OS-4 Students will be introduced to blueprint terms, components, and symbols.**

- a. Demonstrate knowledge of blueprint terms.
- b. Demonstrate knowledge of blueprint components.
- c. Demonstrate knowledge of blueprint symbols.

**Academic Standards:**

*MM1G1. Students will investigate properties of geometric figures in the coordinate plane.*

- a. Determine the distance between two points.*
- b. Determine the distance between a point and a line.*
- c. Determine the midpoint of a segment.*
- d. Understand the distance formula as an application of the Pythagorean theorem.*
- e. Use the coordinate plane to investigate properties of and verify conjecture related to triangles and quadrilaterals.*

*MM1P3. Students will communicate mathematically.*

- a. Organize and consolidate their mathematical thinking through communication.*
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.*
- c. Analyze and evaluate the mathematical thinking and strategies of others.*
- d. Use the language of mathematics to express mathematical ideas precisely.*

*MM1P4. Students will make connections among mathematical ideas and to other disciplines.*

- a. Recognize and use connections among mathematical ideas.*
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.*
- c. Recognize and apply mathematics in contexts outside of mathematics.*

*SSCG18. The student will demonstrate knowledge of the powers of Georgia's state and local governments.*

- a. Examine the powers of state and local government.*
- c. Analyze the services provided by state and local government.*

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*ELA9RL5. Student understands and acquires new vocabulary and uses it correctly in reading and writing.*

- a. Uses general dictionaries, specialized dictionaries, thesauruses, or related references as needed to increase learning.*

*ELA9RC3. The student acquires new vocabulary in each content area and uses it correctly.*

- a. Demonstrates an understanding of contextual vocabulary in various subjects.*
- b. Uses content vocabulary in writing and speaking.*
- c. Explores understanding of new words found in subject area texts.*

*ELA9W3. The student uses research and technology to support writing.*

- b. Uses supporting evidence from multiple sources to develop the main ideas within the body of an essay, composition, or technical document.*
- c. Synthesizes information from multiple sources and identifies complexities and discrepancies in the information and the different perspectives found in each medium (i.e., almanacs, microfiche, news sources, in-depth field studies, speeches, journals, or technical documents).*

**ACCT -OS-5 Students will explain and implement safe rigging procedures.**

- a. Demonstrate the knowledge of basic rigging equipment.*
- b. Demonstrate the knowledge of basic rigging communication.*
- c. Demonstrate the knowledge of basic rigging safety.*

**Academic Standards:**

*MM1G1. Students will investigate properties of geometric figures in the coordinate plane.*

- a. Determine the distance between two points.*
- b. Determine the distance between a point and a line.*
- c. Determine the midpoint of a segment.*
- d. Understand the distance formula as an application of the Pythagorean theorem.*
- e. Use the coordinate plane to investigate properties of and verify conjecture related to triangles and quadrilaterals.*

*MM1P3. Students will communicate mathematically.*

- a. Organize and consolidate their mathematical thinking through communication.*
- b. Communicate their mathematical thinking coherently and clearly to peers,*

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*teachers, and others.*

*c. Analyze and evaluate the mathematical thinking and strategies of others.*

*d. Use the language of mathematics to express mathematical ideas precisely.*

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*SSCG15. The student will explain the functions of the departments and agencies of the federal bureaucracy.*

*a. Compare and contrast the organization and responsibilities of independent regulatory agencies, government corporations, and executive agencies.*

*SSCG18. The student will demonstrate knowledge of the powers of Georgia's state and local governments.*

*a. Examine the powers of state and local government.*

*c. Analyze the services provided by state and local government.*

*ELA9RL5. Student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*c. Uses general dictionaries, specialized dictionaries, thesauruses, or related references as needed to increase learning.*

*ELA9C1. The student demonstrates understanding and control of the rules of the English language, realizing that the usage involves appropriate applications of conventions and grammar in both written and spoken formats.*

*a. Demonstrates an understanding of proper English usage and control of grammar, sentence and paragraph structure, diction, and syntax.*

*c. Demonstrates an understanding of sentence construction (i.e., subordination, proper placement of modifiers) and proper English usage (i.e., consistency of verb tenses).*

*SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.*

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- e. *Measure and calculate the magnitude of gravitational forces.*
- h. *Determine the conditions required to maintain a body in a state of static equilibrium.*

**ACCT -OS-6 Students will explore career pathways in the construction industry.**

- a. Demonstrate knowledge of the job opportunities that are available to entry level employees.
- b. Demonstrate knowledge of the post-secondary training opportunities that are available.
- c. Demonstrate knowledge of the industry licenses and certifications available.

**Academic Standards:**

*SSEF3. The student will explain how specialization and voluntary exchange between buyers and sellers increase the satisfaction of both parties.*

- a. *Give examples of how individuals and businesses specialize.*
- b. *Explain that both parties gain as a result of voluntary, non-fraudulent exchange.*

*SSEM13. The student will explain how markets, prices and competition influence economic behavior.*

- c. *Define price elasticity of demand and supply.*

**Reading Across the Curriculum**

**Reading Standard Comment**

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.



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Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

- a. Reading in all curriculum areas
  - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
  - Read both informational and fictional texts in a variety of genres and modes of discourse.
  - Read technical texts related to various subject areas.
- b. Discussing books
  - Discuss messages and themes from books in all subject areas.
  - Respond to a variety of texts in multiple modes of discourse.
  - Relate messages and themes from one subject area to messages and themes in another area.
  - Evaluate the merit of texts in every subject discipline.
  - Examine author's purpose in writing.
  - Recognize the features of disciplinary texts.
- c. Building vocabulary knowledge
  - Demonstrate an understanding of contextual vocabulary in various subjects.
  - Use content vocabulary in writing and speaking.
  - Explore understanding of new words found in subject area texts.
- d. Establishing context
  - Explore life experiences related to subject area content.
  - Discuss in both writing and speaking how certain words are subject area related.
  - Determine strategies for finding content and contextual meaning for unknown words.

## FOUNDATION SKILLS

**CTAE-FS-1 Technical Skills:** Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

**CTAE-FS-2 Academic Foundations:** Learners achieve state academic standards at or above grade level.

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**CTAE-FS-3 Communications:** Learners use various communication =skills in expressing and interpreting information.

**CTAE-FS-4 Problem Solving and Critical Thinking:** Learners define and solve problems, and use problem-solving and improvement methods and tools.

**CTAE-FS-5 Information Technology Applications:** Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

**CTAE-FS-6 Systems:** Learners understand a variety of organizational structures and functions.

*CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.*

**CTAE-FS-8 Leadership and Teamwork:** Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

**CTAE-FS-9 Ethics and Legal Responsibilities:** Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

*CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.*

**CTAE-FS-11 Entrepreneurship:** Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.