

Implementation Date  
Fall 2008

**PROGRAM CONCENTRATION:**

**Architecture, Construction,  
Communications & Transportation**

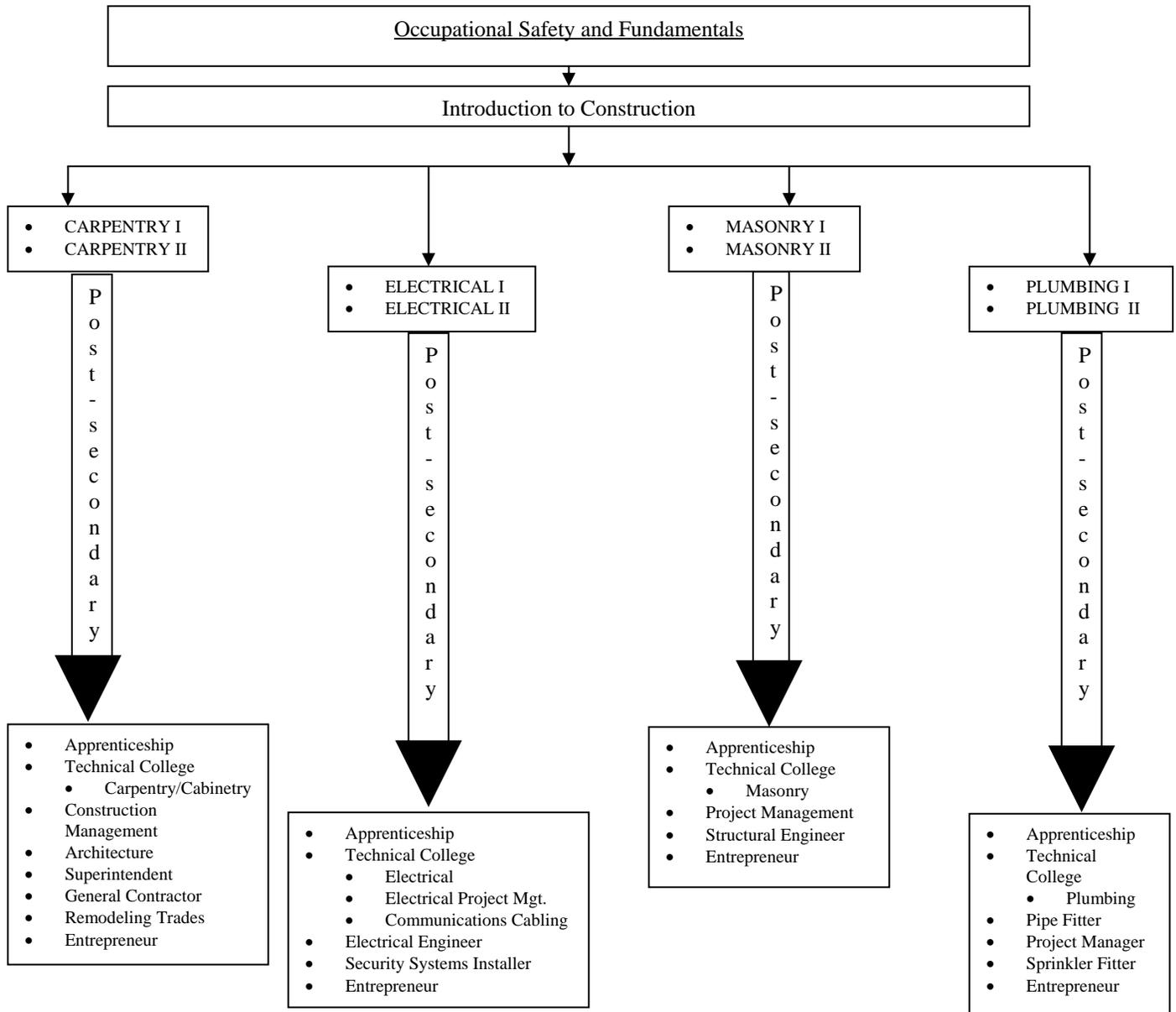
**CAREER PATHWAY:**

**Construction**

This Pathway is designed to prepare a student with foundational knowledge and skills for a construction career in one of four possible construction crafts. It also is a good pathway for a student to prepare for a variety of opportunities in addition to the craft areas, such as Architecture, Construction Engineering and Construction Management.

As the student progresses through the pathway, they are given the opportunity to explore four 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 four craft areas. These areas are Carpentry, Masonry, Electrical, and Plumbing. 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.

### The Construction Career Pathway Map



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**PROGRAM CONCENTRATION:** Architecture, Construction,  
Communications & Transportation  
**CAREER PATHWAY:** Construction  
**COURSE TITLE:** Electrical I

This course is preceded by Introduction to Construction and is the third of four courses that provides the student a solid foundation in electrical skills and knowledge. It is the third step in gaining a Level One Industry Certification in Electrical.

This course builds on the concepts of electrical safety introduced in Occupational Safety. It provides knowledge of the hardware and systems used by an electrician and the basic skills to install them. It provides a general knowledge of electrical systems including series, parallel, and series-parallel circuits. It provides the basic skills and knowledge to navigate and use the National Electrical Code. It provides an introduction to the skills and knowledge of conduit bending and installation.

**ACT-E1-1. Students will know, understand, and apply general construction and specific OSHA and EPA safety concepts and practices.**

- a. Demonstrate safe working procedures in the electrical environment.
- b. Identify electrical hazards and how to minimize them in the workplace.
- c. Explain safety issues concerning lockout, tag out, PPE, assured grounding and isolation programs, confined spaces, breathing, and fall protection.

**ACADEMIC STANDARDS:**

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

*SSUSH16. The student will identify the key developments in the aftermath of WW I.*

**ACT-E1-2. Students will use tools, instruments, and equipment in a professional and safe manner.**

- a. Demonstrate 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends using a hand bender.
- b. Demonstrate correct application of fasteners and anchors.
- c. Demonstrate proper use of a multi-meter, clamp-on ammeter, and megohmmeter.
- d. Demonstrate the knowledge of testing GFCI.

**ACADEMIC STANDARDS:**

*MM1A1. Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.*

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*MMA2. Students will simplify and operate with radical expressions, polynomials, and rational expressions.*

*MM1A3. Students will solve simple equations.*

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

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

*SP2. Students will evaluate the significance of energy in understanding the structure of matter and the universe.*

**ACT-E1-3. Students will understand the selection, handling, storage, and proper use of electrical materials.**

- a. Recognize the correct fasteners and anchors.
- b. Handle and store capacitors, motors, transformers, and other electrical equipment properly.

**ACADEMIC STANDARDS:**

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

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

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

**ACT-E1-4. Students will read, interpret, apply information, and estimate costs from a variety of architectural and construction working drawings.**

- a. Read and interpret electrical blueprints.
- b. Estimate materials based on blueprints provided.

**ACADEMIC STANDARDS:**

*MC1G1. Students will investigate properties of geometric figures in the coordinate plane.*

*MC1P1. Students will solve problems (using appropriate technology).*

*MC1P3. Students will communicate mathematically.*

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*MC1P4. Students will make connections among mathematical ideas and to other disciplines.*

*MC2A2. Students will solve simple equations.*

*MC2G1. Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.*

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

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

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

**ACT-E1-5. Students will understand electrical circuitry including raceways, boxes, and conduit.**

- a. Size electrical devices and boxes properly.
- b. Size electrical conduit properly.
- c. Compute loads for various circuits.

**ACADEMIC STANDARDS:**

*MM1A3. Students will solve simple equations.*

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

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

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

**CTAE Foundation Skills**

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

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The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

**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.

**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.