## Curriculum Standard for Construction: Architecture & Construction Technology

**Career Cluster:** Architecture and Construction**

**Cluster Description:** Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

| **Pathway:** Construction | **Effective Term:** Fall 2013 (2013*03) |
|---|---|

### Program Majors Under Pathway

| Program Major / Classification of Instruction Programs (CIP) Code | | Credential Level(s) Offered | Program Major Code |
|---|---|---|---|
| Architectural Technology | CIP Code 15.0101 | AAS/Diploma/Certificate | A40100 |
| Building Construction Technology | CIP Code: 46.0499 | AAS/Diploma/Certificate | A35140 |
| Carpentry | CIP Code: 46.0201 | Diploma/Certificate | D35180 |
| Construction Management Technology | CIP Code 46.0401 | AAS/Diploma/Certificate | A35190 |
| Masonry | CIP Code: 46.0101 | Diploma/Certificate | D35280 |
| Plumbing | CIP Code: 46.0503 | Diploma/Certificate | D35300 |

### Pathway Description:

These curriculums are designed to prepare individuals to apply technical knowledge and skills to the fields of architecture, construction, construction management, and other associated professions.

Course work includes instruction in sustainable building and design, print reading, building codes, estimating, construction materials and methods, and other topics related to design and construction occupations.

Graduates of this pathway should qualify for entry-level jobs in architectural, engineering, construction and trades professions as well as positions in industry and government.

*Program Description: Choose one of the following* **4th paragraphs** *to use in conjunction with the first three paragraphs of the pathway description above for documentation used to identify each* **Program Major:**

**Architectural Technology:**
A program that prepares individuals to assist architects, engineers, and construction professionals in developing plans and related documentation for residential and commercial projects in both the private and public sectors. Includes instruction in architectural drafting, computer-assisted drafting, construction materials and methods, environmental systems, codes and standards, structural principles, cost estimation, planning, graphics, and presentation.

**Building Construction Technology:**
A program that prepares individuals to apply technical knowledge and skills to residential and commercial building construction and remodeling. Includes instruction in construction equipment and safety; site preparation and layout; construction estimating; print reading; building codes; framing; masonry; heating, ventilation, and air conditioning; electrical and mechanical systems; interior and exterior finishing; and plumbing.

**Carpentry:**
A program that prepares individuals to apply technical knowledge and skills to lay out, cut, fabricate, erect, install, and repair wooden structures and fixtures, using hand and power tools. Includes instruction in technical mathematics, framing, construction materials and selection, job estimating, print reading, foundations and roughing-in, finish carpentry techniques, and applicable codes and standards.

**Construction Management Technology:**
A program that prepares individuals to supervise, manage, and inspect construction sites, buildings, and associated facilities. Includes instruction in site safety, personnel supervision, labor relations, diversity training, construction documentation, scheduling, resource and cost control, bid strategies, rework prevention, construction insurance and bonding, accident management and investigation, applicable law and regulations, and communication skills.

**Masonry:**
A program that prepares individuals to apply technical knowledge and skills in the laying and/or setting of exterior brick, concrete block, and related materials, using trowels, levels, hammers, chisels, and other hand tools. Includes instruction in technical mathematics, print reading, structural masonry, decorative masonry, foundations, reinforcement, mortar preparation, cutting and finishing, and applicable codes and standards.

**Plumbing:**
A program that prepares individuals to work in the field of plumbing by applying technical knowledge and skills to lay out, assemble, install, and maintain piping fixtures and systems for natural gas, lp gas, hot water, drainage, sprinkling, and plumbing processing systems in residential and commercial environments. Includes instruction in source determination, water service and distribution, waste removal, pressure adjustment, basic physics, technical mathematics, print reading, pipe installation, pumps, soldering, plumbing inspection, and applicable codes and standards.

**I. General Education Academic Core**

*[Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.10]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

## Construction: Architecture and Construction Technology

| Recommended General Education Academic Core | AAS | Diploma | Certificate |
|---|---|---|---|
| **Minimum General Education Hours Required:** | **15 SHC** | **6 SHC** | **0 SHC** |

*Courses listed below are recommended general education courses for this curriculum standard. Colleges may choose to include additional or alternative general education courses to meet local curriculum needs.*

*\*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.*

| | AAS | Diploma | Certificate |
|---|---|---|---|
| **Communication:** | **6 SHC** | **3-6 SHC** | **Optional** |
| \* COM 101 Workplace Communication 3 SHC | | | |
| COM 110 Introduction to Communication 3 SHC | | | |
| COM 120 Intro Interpersonal Com 3 SHC | | | |
| COM 231 Public Speaking 3 SHC | | | |
| \* ENG 101 Applied Communications I 3 SHC | | | |
| \* ENG 102 Applied Communications II 3 SHC | | | |
| ENG 110 Freshman Composition 3 SHC | | | |
| ENG 111 Expository Writing 3 SHC | | | |
| ENG 114 Prof Research & Reporting 3 SHC | | | |
| ENG 116 Technical Report Writing 3 SHC | | | |
| **Humanities/Fine Arts:** | **3 SHC** | **0-3 SHC** | **Optional** |
| \* HUM 101 Values in the Workplace 2 SHC | | | |
| HUM 110 Technology and Society 3 SHC | | | |
| HUM 115 Critical Thinking 3 SHC | | | |
| HUM 230 Leadership Development 3 SHC | | | |
| PHI 230 Introduction to Logic 3 SHC | | | |
| PHI 240 Introduction to Ethics 3 SHC | | | |

| | | | | | 3 SHC | 0-3 SHC | Optional |
|---|---|---|---|---|---|---|---|
| **Social /Behavioral Sciences:** | | | | | | | |
| | ECO | 151 | Survey of Economics | 3 SHC | | | |
| | ECO | 251 | Prin of Microeconomics | 3 SHC | | | |
| * | SOC | 105 | Social Relationships | 3 SHC | | | |
| | SOC | 210 | Intro to Sociology | 3 SHC | | | |
| | SOC | 215 | Group Processes | 3 SHC | | | |
| * | PSY | 101 | Applied Psychology | 3 SHC | | | |
| * | PSY | 102 | Human Relations | 2 SHC | | | |
| | PSY | 118 | Interpersonal Psychology | 3 SHC | | | |
| | PSY | 135 | Group Processes | 3 SHC | | | |
| | PSY | 150 | General Psychology | 3 SHC | | | |
| **Natural Sciences/Mathematics:** | | | | | 3 SHC | 0-3 SHC | Optional |
| | MAT | 110 | Math Measurement & Literacy | 3 SHC | | | |
| | MAT | 121 | Algebra/Trigonometry I | 3 SHC | | | |
| | MAT | 143 | Quantitative Literacy | 3 SHC | | | |
| | MAT | 152 | Statistical Methods I | 4 SHC | | | |
| | PHY | 110 | Conceptual Physics | 3 SHC | | | |
| | PHY | 121 | Applied Physics I | 4 SHC | | | |

**II. Major Hours**. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work-based learning may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. **Technical Core.** The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. **Program Major(s).** The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. **Other Major Hours.** Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

| **Construction: Architecture and Construction Technology** | AAS | Diploma | Certificate |
|---|---|---|---|
| **Minimum Major Hours Required:** | **49 SHC** | **30 SHC** | **12 SHC** |
| **A. Technical Core:** *For AAS Degree programs, select a minimum of (12) semester hours of credit from the following courses. For Diploma programs, choose a minimum of (3) semester hours of credit from the following courses.* | **24 SHC** | | |

| | | | |
|---|---|---|---|
| ARC | 112 | Constr Matls & Methods | 4 SHC |
| ARC | 131 | Building Codes | 3 SHC |
| ARC | 132 | Specifications & Contract | 2 SHC |
| BPR | 130 | Print Reading – Construction | 3 SHC |
| CMT | 120 | Codes and Inspections | 3 SHC |
| CST | 241 | Planning/Estimating I | 3 SHC |
| SST | 140 | Green Building & Design Concepts | 3 SHC |

**B. Program Major(s).**

*For the AAS Degree, select one program major plus additional courses from the prefixes listed within the same program major for a minimum of (12) semester hours of credits.*

    **Architectural Technology**

| | | | | |
|---|---|---|---|---|
| | ARC | 111 | Intro to Arch Technology | 3 SHC |
| | ARC | 114 | Architectural CAD | 2 SHC |
| | | | | |
| | ARC | 113 | Res Arch Tech | 3 SHC |
| *or* | ARC | 211 | Light Const Tech | 3 SHC |
| | | | | |
| | ARC | 213 | Design Project | 4 SHC |
| | ARC | 230 | Environmental Systems | 4 SHC |

    **Building Construction Technology**

| | | | | | |
|---|---|---|---|---|---|
| | CAR | 111 | Carpentry I | 8 SHC | |
| *or* | CST | 111 | Construction I | 4 SHC | *and* |
| | CST | 112 | Construction II | 4 SHC | |
| | | | | | |
| | CST | 221 | Statics/Structures | 4 SHC | |

    **Construction Management Technology**

| | | | | |
|---|---|---|---|---|
| | CMT | 210 | Construction Management Fund | 3 SHC |
| | CMT | 212 | Total Safety Performance | 3 SHC |
| | | | | |
| | ACC | 120 | Prin of Financial Acct | 4 SHC |
| *or* | BUS | 139 | Entrepreneurship I | 3 SHC |
| *or* | BUS | 230 | Small Business Management | 3 SHC |

**Carpentry** *Course(s) required for the Carpentry Diploma are designated with ***
| | | | | |
|---|---|---|---|---|
| * | CAR | 111 | Carpentry I | 8 SHC |

**Masonry** *Course(s) required for the Masonry Diploma are designated with ***
| | | | | |
|---|---|---|---|---|
| * | MAS | 110 | Masonry I | 10 SHC |

**Plumbing** *Course(s) required for the Plumbing Diploma are designated with ***
| | | | | |
|---|---|---|---|---|
| * | PLU | 110 | Modern Plumbing | 9 SHC |

**C. Other Major Hours.**

    *To be selected from the following prefixes:*

    ACC, AHR, ALT, ARC, ART, BPR, BUS, CAB, CAR, CEG, CIS, CIV, CMT, CSC, CST, DES, DFT, ECO, EGR, EHS, ELC, ENV, EUS, GIS, HEO (A35140 only), HOR, HUM, HYD, ISC, LAR, LID, MAS, MAT, MEC, PCW, PFT, PHY, PLU, REF, SPA, SRV, SST, TRF, UAS, WAT, WBL, WLD, and WOL.

    *Up to two semester hour credits may be selected from ACA.*

    *Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA JPN, LAT, POR, RUS and SPA.*

**III. Other Required Hours**

    *A college may include courses to meet graduation or local employer requirements in a certificate (0-1 SHC), diploma (0-4 SHC), or an associate in applied science (0-7 SHC) program. These curriculum courses shall be selected from the Combined Course Library and must be approved by the System Office prior to implementation. Restricted, unique, or free elective courses may not be included as other required hours.*

## IV. Employability Competencies

Fundamental competencies that address soft skills vital to employability, personal, and professional success are listed below. Colleges are encouraged to integrate these competencies into the curriculum by embedding appropriate student learning outcomes into one or more courses or through alternative methods.

 A. **Interpersonal Skills and Teamwork** – The ability to work effectively with others, especially to analyze situations, establish priorities, and apply resources for solving problems or accomplishing tasks.

 B. **Communication** – The ability to effectively exchange ideas and information with others through oral, written, or visual means.

 C. **Integrity and Professionalism –** Workplace behaviors that relate to ethical standards, honesty, fairness, respect, responsibility, self-control, criticism and demeanor.

 D. **Problem-solving** – The ability to identify problems and potential causes while developing and implementing practical action plans for solutions.

 E. **Initiative and Dependability** – Workplace behaviors that relate to seeking out new responsibilities, establishing and meeting goals, completing tasks, following directions, complying with rules, and consistent reliability.

 F. **Information processing** – The ability to acquire, evaluate, organize, manage, and interpret information.

 G. **Adaptability and Lifelong Learning –** The ability to learn and apply new knowledge and skills and adapt to changing technologies, methods, processes, work environments, organizational structures and management practices.

 H. **Entrepreneurship –** The knowledge and skills necessary to create opportunities and develop as an employee or self-employed business owner.

*An **Employability Skills Resource Toolkit** has been developed by NC-NET for the competencies listed above. Additional information is located at:  http://www.nc-net.info/employability.php*

**The *North Carolina Career Clusters Guide was developed by the North Carolina Department of Public Instruction and the North Carolina Community College system to link the academic and Career and Technical Education programs at the secondary and postsecondary levels to increase student achievement.  Additional information about Career Clusters is located at: http://www.nc-net.info/NC_career_clusters_guide.php or http://www.careertech.org.*

| *Summary of Required Semester Hour Credits (SHC) for each credential:* | **AAS** | **Diploma** | **Certificate** |
|---|---|---|---|
| Minimum General Education Hours | 15 | 6 | 0 |
| Minimum Major Hours | 49 | 30 | 12 |
| Other Required Hours | 0-7 | 0-4 | 0-1 |
| **Total Semester Hours Credit (SHC)** | **64-76** | **36-48** | **12-18** |