

## 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
Building Construction Technology	CIP Code: 46.0499	AAS/Diploma/Certificate
Carpentry	CIP Code: 46.0201	Diploma/Certificate
Construction Management Technology	CIP Code 46.0401	AAS/Diploma/Certificate
Masonry	CIP Code: 46.0101	Diploma/Certificate
Plumbing	CIP Code: 46.0503	Diploma/Certificate

### 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 4<sup>th</sup> 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.

\*Within the degree program, the institution shall include opportunities for the achievement of competence in reading, writing, oral communication, fundamental mathematical skills, and basic use of computers.

Approved by the State Board of Community Colleges on August 16, 2012; Editorial Revision 09/11/12; Editorial Revision 12/14/12; Editorial Revision 08/21/13; Editorial Revision 08/18/14; CRC Revised—Electronic Only 03/12/15; Prefix Addition 08/01/15; SBCC Revised 03/17/17; Prefix Addition (35190) 08/08/19; Prefix addition (PCW-35140) 09/17/19; CCRC Revised--Electronic Only (RISE Initiative) 10/24/19.

**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																																																																																
<b>Minimum General Education Hours Required:</b>	<b>15 SHC</b>	<b>6 SHC</b>	<b>0 SHC</b>																																																																																
<p><i>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.</i></p> <p><i>*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.</i></p> <p><b>Communication:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">*</td><td style="width: 10%;">COM</td><td style="width: 10%;">101</td><td style="width: 45%;">Workplace Communication</td><td style="width: 10%;">3 SHC</td></tr> <tr><td></td><td>COM</td><td>110</td><td>Introduction to Communication</td><td>3 SHC</td></tr> <tr><td></td><td>COM</td><td>120</td><td>Intro Interpersonal Com</td><td>3 SHC</td></tr> <tr><td></td><td>COM</td><td>231</td><td>Public Speaking</td><td>3 SHC</td></tr> <tr><td>*</td><td>ENG</td><td>101</td><td>Applied Communications I</td><td>3 SHC</td></tr> <tr><td>*</td><td>ENG</td><td>102</td><td>Applied Communications II</td><td>3 SHC</td></tr> <tr><td></td><td>ENG</td><td>110</td><td>Freshman Composition</td><td>3 SHC</td></tr> <tr><td></td><td>ENG</td><td>111</td><td>Expository Writing</td><td>3 SHC</td></tr> <tr><td></td><td>ENG</td><td>114</td><td>Prof Research &amp; Reporting</td><td>3 SHC</td></tr> <tr><td></td><td>ENG</td><td>116</td><td>Technical Report Writing</td><td>3 SHC</td></tr> </table> <p><b>Humanities/Fine Arts:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">*</td><td style="width: 10%;">HUM</td><td style="width: 10%;">101</td><td style="width: 45%;">Values in the Workplace</td><td style="width: 10%;">2 SHC</td></tr> <tr><td></td><td>HUM</td><td>110</td><td>Technology and Society</td><td>3 SHC</td></tr> <tr><td></td><td>HUM</td><td>115</td><td>Critical Thinking</td><td>3 SHC</td></tr> <tr><td></td><td>HUM</td><td>230</td><td>Leadership Development</td><td>3 SHC</td></tr> <tr><td></td><td>PHI</td><td>230</td><td>Introduction to Logic</td><td>3 SHC</td></tr> <tr><td></td><td>PHI</td><td>240</td><td>Introduction to Ethics</td><td>3 SHC</td></tr> </table>	*	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	*	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	<b>6 SHC</b>	<b>3-6 SHC</b>	<b>Optional</b>
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<b>Social /Behavioral Sciences:</b>				<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
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	<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
<b>Natural Sciences/Mathematics:</b>						
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.

<b>Construction: Architecture and Construction Technology</b>	<b>AAS</b>	<b>Diploma</b>	<b>Certificate</b>
<b>Minimum Major Hours Required:</b>	<b>49 SHC</b>	<b>30 SHC</b>	<b>12 SHC</b>
<b>A. Technical Core:</b> <i>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.</i>	<b>24 SHC</b>		
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**

or	CAR	111	Carpentry I	8 SHC	
	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	

or	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	
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**Masonry Course(s) required for the Masonry Diploma are designated with \***

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

*	PLU	110	Modern Plumbing	9 SHC	
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**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, HYD, HOR, HUM, 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](http://www.nc-net.info/NC_career_clusters_guide.php) or <http://www.careertech.org>.*

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