



**NORTH CAROLINA COMMUNITY COLLEGE SYSTEM**

***R. Scott Ralls, Ph.D.***

***President***

April 6, 2015

**To:** Presidents  
Chief Academic Officers

**From:** Wesley Beddard, Associate Vice President  
Programs

**Subject:** Curriculum Review Committee Course Approvals

The Curriculum Review Committee (CRC) has the responsibility for maintaining the curriculum courses in the Combined Course Library (CCL). The approved course requests from the Spring 2015 CRC meeting, held on March 12, 2015, are attached for your information. *Course revisions may involve the removal of required prerequisites or corequisites. Please note that colleges may add local prerequisites and/or corequisites if they determine a need exists.*

**Course Revision Impact to Curriculum Standards**

The CRC approved requests to revise the **course description, prerequisite(s), corequisite(s), and/or class/lab hours** of core courses found on the curriculum standards listed below. Please note that the only change indicated on the printed standard will be the inclusion of the statement “*CRC Revised-Electronic Only 3/12/15*”, since only the electronic version of the standard template will be revised.

Building Construction Technology (A35140)  
Mammography (Certificate) (C45830)  
Metal Engraving (Diploma) (D30240)  
Nondestructive Examination Technology (A50350)

CC15-013  
Email

Presidents  
Chief Academic Officers  
Page 2  
April 6, 2015

The State Board of Community Colleges has delegated authority to the Senior Vice President to approve curriculum standard changes involving **core course title and/or credit hour changes** resulting from CRC action. The standards listed below have been revised as a result CRC approved changes to one or more core courses.

Brewing, Distillation, Fermentation (A15250)  
Web Technologies (A25290)

Please be aware that you must implement the attached revised courses and standards no later than one year after the effective term. You must update your college's electronic program of study and receive approval from the System Office prior to implementation of the revised courses and programs. The revised standards are attached for your convenience.

Curriculum standards, curriculum courses and procedures for submitting requests to the CRC are available on the Academic Programs home page at <http://www.nccommunitycolleges.edu/programs>. If you need assistance or clarification, please contact Ms. Jennifer Frazelle, Director of Academic Programs at [frazellej@nccommunitycolleges.edu](mailto:frazellej@nccommunitycolleges.edu) or (919) 807-7120.

WB/dm Attachments

c: Curriculum Review Committee  
Dr. Lisa Chapman  
Ms. Elizabeth Self  
Ms. Jennifer Frazelle  
Program Coordinators

CC15-013  
Email

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)  
March 12, 2015**

<b>Course Prefix #</b>	<b>Title</b>	<b>Request</b>	<b>Effective Semester</b>	<b>Curriculum Standard Core Course</b>
ASL 253	ASL Non-manual Signals	Change prerequisites from "ASL 212" to "ASL 211"	Spring 2016 (2016*01)	NA
ASL 260	ASL Semantics	Change course description Change prerequisites from "ASL 222" to "ASL 250"	Spring 2016 (2016*01)	NA
BDF 111	Safety and Sanitation	Change course hours from "3-2-0-4" to "1-2-0-2"	Fall 2015 (2015*03) Early Implementation	Brewing, Distillation and Fermentation (A15250)
BDF 150	Craft Bev Lab Methods	New CCL course	Summer 2015 (2015*02)	NA
BDF 180	Sensory Evaluation	Change course hours from "2-3-0-3" to "2-2-0-3"	Fall 2015 (2015*03) Early Implementation	NA
BDF 230	Advanced Brewing	Change course hours from "2-4-0-4" to "2-2-0-3"	Fall 2015 (2015*03) Early Implementation	NA
CST 221	Statics/Structures	Change prerequisites from "Take One Set: <b>Set1:</b> MAT-121 and ARC 112, <b>Set2:</b> MAT-121 and CAR-112, <b>Set3:</b> MAT-121 and CST-112, <b>Set4:</b> MAT-171 and ARC-112, <b>Set5:</b> MAT-171 and CAR-112, <b>Set6:</b> MAT-171 and CST-112" to "Take One Set: <b>Set1:</b> MAT 110 or MAT 121 and ARC 112, <b>Set2:</b> MAT 110 or MAT 121 and CAR 112, <b>Set3:</b> MAT 110 or MAT 121 and CST 112, <b>Set4:</b> MAT 171 and ARC 112, <b>Set5:</b> MAT 171 and CAR 112, <b>Set6:</b> MAT 171 and CST 112"	Spring 2016 (2016*01)	Building Construction Technolgy (A35140)
CUL 165	Therapeutic Cuisine	New CCL course	Summer 2015 (2015*02)	NA
FVP 215	Production Management	Change corequisite from "FVP 238" to "FVP 238 or FVP 240"	Spring 2016 (2016*01)	NA
GRD 188	Graphic Design for Web I	New CCL course	Summer 2015 (2015*02)	NA
GRD 281	Design of Advertising	Change hours from "2-0-0-2" to "1-3-0-2"; Change course description	Fall 2015 (2015*03) Early Implementation	NA

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)  
March 12, 2015**

<b>Course Prefix #</b>	<b>Title</b>	<b>Request</b>	<b>Effective Semester</b>	<b>Curriculum Standard Core Course</b>
GRD 288	Graphic Design for Web II	New CCL course	Summer 2015 (2015*02)	NA
GSM 240	Modern Sporting Firearms	New CCL course	Summer 2015 (2015*02)	NA
LEO 213	Advanced Photonics Applications	New CCL course	Summer 2015 (2015*02)	NA
MAM 102	Mammography Instrumentation & QA	Change course description	Summer 2015 (2015*02) Early Implementation	Mammography (C45830)
MAM 104	Digital Breast Tomosynthesis	New CCL course	Summer 2015 (2015*02)	NA
MEG 116	Flushed and Raised Inlay	Change course hours from "2-9-0-5" to "1-3-0-2"	Fall 2015 (2015*03) Early Implementation	NA
MEG 117	Engraving Applications	Change prerequisites from "MEG 111" to "None"	Fall 2015 (2015*03) Early Implementation	Metal Engraving (D30240)
MSC 120	Marine Software & Data Ntwks	New CCL course	Summer 2015 (2015*02) Early Implementation	NA
MSC 210	Marine Envir Samp & Analysis	New CCL course	Summer 2015 (2015*02)	NA
MSC 220	Marine GIS	Change prerequisites from "CIS 110 or CIS 111" to "MSC 120"	Summer 2015 (2015*02) Early Implementation	NA
MSC 254	Marine Data Processing	Change prerequisites from "CIS 110 or CIS 111 and MSC 152" to "MSC 120 and MSC 152"	Summer 2015 (2015*02) Early Implementation	NA

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)  
March 12, 2015**

<b>Course Prefix #</b>	<b>Title</b>	<b>Request</b>	<b>Effective Semester</b>	<b>Curriculum Standard Core Course</b>
NDE 131	Rad Safety & Prin of RT	Change prerequisite from "NDE 110, NDE 112, MAT 121, and PHY 131" to " NDE 110, NDE 112, and MAT 121" Change corequisites from "None" to "PHY 131"	Summer 2015 (2015*02) Early Implementation	Nondestructive Examination Technology (A50350)
NDE 222	Advanced UT	Change course hours from "2-2-0-3" to "2-3-0-3" Change title from "Advanced UT" to "Advanced UT Including Phased Array" Change course description (Central Piedmont CC)	Summer 2015 (2015*02) Early Implementation	NA
NDE 242	Advanced Visual Testing (VT)	New CCL course	Summer 2015 (2015*02)	NA
NDE 252	Eddy Current Testing (ET)	Change prerequisites from "NDE 151" to "NDE 153"	Summer 2015 (2015*02) Early Implementation	NA
NET 241	Introduction to VOIP	New CCL course	Summer 2015 (2015*02)	NA
SAB 250	Prevention & Education	Change prerequisite from "SAB 140" to "SAB 110 or SAB 140"	Spring 2016 (2016*01)	NA
TRN 111	Chassis Maint/Light Repair	New CCL course	Summer 2015 (2015*02)	NA
TRN 112	Powertrain Maint/Light Repair	New CCL course	Summer 2015 (2015*02)	NA
WEB 120	Intro Internet Multimedia	Change course description Expand Title	Fall 2015 (2015*03) Early Implementation	Web Technologies (A25290)

## 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	Credentialed 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 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.

**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 400.97 (3)]: 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> <ul style="list-style-type: none"> <li>*COM 101 Workplace Communication 3 SHC</li> <li>COM 110 Introduction to Communication 3 SHC</li> <li>COM 120 Intro Interpersonal Com 3 SHC</li> <li>COM 231 Public Speaking 3 SHC</li> <li>* ENG 101 Applied Communications I 3 SHC</li> <li>*ENG 102 Applied Communications II 3 SHC</li> <li>ENG 110 Freshman Composition 3 SHC</li> <li>ENG 111 Expository Writing 3 SHC</li> <li>ENG 114 Prof Research &amp; Reporting 3 SHC</li> <li>ENG 116 Technical Report Writing 3 SHC</li> </ul> <p><b>Humanities/Fine Arts:</b></p> <ul style="list-style-type: none"> <li>*HUM 101 Values in the Workplace 2 SHC</li> <li>HUM 110 Technology and Society 3 SHC</li> <li>HUM 115 Critical Thinking 3 SHC</li> <li>HUM 230 Leadership Development 3 SHC</li> <li>PHI 230 Introduction to Logic 3 SHC</li> <li>PHI 240 Introduction to Ethics 3 SHC</li> </ul> <p><b>Social /Behavioral Sciences:</b></p> <ul style="list-style-type: none"> <li>ECO 151 Survey of Economics 3 SHC</li> <li>ECO 251 Prin of Microeconomics 3 SHC</li> <li>* SOC 105 Social Relationships 3 SHC</li> <li>SOC 210 Intro to Sociology 3 SHC</li> <li>SOC 215 Group Process 3 SHC</li> <li>*PSY 101 Applied Psychology 3 SHC</li> <li>*PSY 102 Human Relations 2 SHC</li> <li>PSY 118 Interpersonal Psychology 3 SHC</li> <li>PSY 135 Group Processes 3 SHC</li> <li>PSY 150 General Psychology 3 SHC</li> </ul> <p><b>Natural Sciences/Mathematics:</b></p> <ul style="list-style-type: none"> <li>*MAT 101 Applied Mathematics I 3 SHC</li> <li>MAT 110 Mathematical Measurements 3 SHC</li> <li>MAT 115 Mathematical Models 3 SHC</li> <li>MAT 120 Geometry and Trigonometry 3 SHC</li> <li>MAT 121 Algebra/Trigonometry I 3 SHC</li> <li>PHY 110 Conceptual Physics 3 SHC</li> <li>PHY 121 Applied Physics I 4 SHC</li> </ul>	<b>6 SHC</b>	<b>3-6 SHC</b>	<b>Optional</b>
	<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
	<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>



**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>																																																
<p><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></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="padding-left: 40px;">ARC 112 Constr Matls &amp; Methods</td><td style="text-align: right;">4 SHC</td></tr> <tr><td style="padding-left: 40px;">ARC 131 Building Codes</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">ARC 132 Specifications &amp; Contract</td><td style="text-align: right;">2 SHC</td></tr> <tr><td style="padding-left: 40px;">BPR 130 Print Reading – Construction</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">CMT 120 Codes and Inspections</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">CST 241 Planning/Estimating I</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">SST 140 Green Building &amp; Design Concepts</td><td style="text-align: right;">3 SHC</td></tr> </table> <p><b>B. Program Major(s).</b>  <i>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.</i></p> <p><b>Architectural Technology</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="padding-left: 40px;">ARC 111 Intro to Arch Technology</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">ARC 114 Architectural CAD</td><td style="text-align: right;">2 SHC</td></tr> <tr><td colspan="2" style="padding: 10px 0 10px 40px;">or</td></tr> <tr><td style="padding-left: 40px;">ARC 113 Res Arch Tech</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">ARC 211 Light Const Tech</td><td style="text-align: right;">3 SHC</td></tr> <tr><td colspan="2" style="padding: 10px 0 10px 40px;">or</td></tr> <tr><td style="padding-left: 40px;">ARC 213 Design Project</td><td style="text-align: right;">4 SHC</td></tr> <tr><td style="padding-left: 40px;">ARC 230 Environmental Systems</td><td style="text-align: right;">4 SHC</td></tr> </table> <p><b>Building Construction Technology</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="padding-left: 40px;">CAR 111 Carpentry I</td><td style="text-align: right;">8 SHC</td></tr> <tr><td style="padding-left: 40px;">CST 111 Construction I</td><td style="text-align: right;">4 SHC</td></tr> <tr><td style="padding-left: 40px;">CST 112 Construction II</td><td style="text-align: right;">4 SHC</td></tr> <tr><td colspan="2" style="padding: 10px 0 10px 40px;">and</td></tr> <tr><td style="padding-left: 40px;">CST 221 Statics/Structures</td><td style="text-align: right;">4 SHC</td></tr> </table> <p><b>Construction Management Technology</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="padding-left: 40px;">CMT 210 Construction Management Fund</td><td style="text-align: right;">3 SHC</td></tr> <tr><td style="padding-left: 40px;">CMT 212 Total Safety Performance</td><td style="text-align: right;">3 SHC</td></tr> <tr><td colspan="2" style="padding: 10px 0 10px 40px;">or</td></tr> <tr><td style="padding-left: 40px;">ACC 120 Prin of Financial Acct</td><td style="text-align: right;">4 SHC</td></tr> </table>	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	ARC 111 Intro to Arch Technology	3 SHC	ARC 114 Architectural CAD	2 SHC	or		ARC 113 Res Arch Tech	3 SHC	ARC 211 Light Const Tech	3 SHC	or		ARC 213 Design Project	4 SHC	ARC 230 Environmental Systems	4 SHC	CAR 111 Carpentry I	8 SHC	CST 111 Construction I	4 SHC	CST 112 Construction II	4 SHC	and		CST 221 Statics/Structures	4 SHC	CMT 210 Construction Management Fund	3 SHC	CMT 212 Total Safety Performance	3 SHC	or		ACC 120 Prin of Financial Acct	4 SHC	<b>24 SHC</b>		
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<p>or BUS 139 Entrepreneurship I 3 SHC</p> <p>or BUS 230 Small Business Management 3 SHC</p> <p><b>Carpentry Course(s) required for the Carpentry Diploma are designated with *</b></p> <p>* CAR 111 Carpentry I 8 SHC</p> <p><b>Masonry Course(s) required for the Masonry Diploma are designated with *</b></p> <p>* MAS 110 Masonry I 10 SHC</p> <p><b>Plumbing Course(s) required for the Plumbing Diploma are designated with *</b></p> <p>* PLU 110 Modern Plumbing 9 SHC</p>			
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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, PFT, PHY, PLU, REF, SPA, SRV, SST, TRF, WAT, WBL, WLD, and WOL.

*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>.

Summary of Required Semester Hour Credits (SHC) for each credential:

	<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>

# CURRICULUM STANDARD

<i>Effective Term</i> Fall 2012 [2012*03]
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Curriculum Program Title	<b>Mammography (Certificate)</b>	Program Code	<b>C45830</b>
Concentration	<b>(not applicable)</b>	CIP Code	<b>51.0919</b>

## ***Curriculum Description***

The Mammography curriculum provides registered radiologic technologists the didactic and clinical experience necessary to become registered mammographers.

Course work includes clinical rotations to mammography facilities, breast anatomy/physiology, patient preparation/education, mammographic procedures, interventional procedures, image analysis, mammographic instrumentation, physics, quality control, and quality assurance.

Graduates will meet the Mammography Quality Standards Act initial training requirements for mammography and may be eligible to apply to take the American Registry of Radiologic Technologists (ARRT) post primary certification in Mammography.

## ***Curriculum Requirements\****

*[for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.97 (3)]*

- I. General Education.** 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.
- 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. *(See second page for additional information.)*
- III. Other Required Hours.** A college may include courses to meet graduation or local employer requirements in a certificate, diploma, or associate in applied science 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.

	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
<b>Total Semester Hours Credit in Program</b>	<b>64-76</b>	<b>36-48</b>	<b>12-18</b>

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*\*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.*

## *Major Hours*

*[ref. 1D SBCCC 400.97 (3)]*

- A. Core.** The subject/course core is comprised of subject areas and/or specific courses which are required for each curriculum program. 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 subject/course core of the AAS program.
- B. Concentration (if applicable).** A concentration of study must include a minimum of 12 semester hours of credit from required subjects and/or courses. The majority of the course credit hours are unique to the concentration. The required subjects and/or courses that make up the concentration of study are in addition to the required subject/course 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 any prefix listed, with the exception of prefixes listed in the core or concentration. 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.

### **Mammography (Certificate) (C45830)**

	<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. CORE</b>			<b>16 SHC</b>
<b>Required Courses:</b> MAM 101 Mam Proc & Image Analysis 4 SHC MAM 102 Mam Instrumentation & QA 3 SHC MAM 103 Digital Mammography 1 SHC MAM 105 Mammography Clinical Ed 5 SHC MAM 109 Mammography Capstone 3 SHC			
<b>B. CONCENTRATION (if applicable)</b>			
<b>C. OTHER MAJOR HOURS</b> <i>To be selected from the following prefixes:</i>  Not applicable  <i>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.</i>			

# CURRICULUM STANDARD

*Effective Term*  
Fall 1997  
[1997\*03]

Curriculum Program Title	<b>Metal Engraving (Diploma)</b>	Program Code	<b>D30240</b>
Concentration	<b>(not applicable)</b>	CIP Code	<b>50.0713</b>

## *Curriculum Description*

The Metal Engraving curriculum is designed to train students in eye-hand coordination, artistic vision, and the technology necessary in occupations involving the embellishment of metals.

Course work will include embellishments utilizing the hammer and chisel, power engraving devices, acid etching, the inlaying of precious metals and jewels into a metal base, bas-relief graving, and the sinking of scenes into the medium.

Graduates should be able to apply the acquired skills in occupations requiring sound bench work skills. Such occupations might include gold and/or silver smithing, gunsmithing, the tool and die trades, printing plates, and jewelry.

## *Curriculum Requirements\**

*[for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.97 (3)]*

- I. General Education.** 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.
- 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. *(See second page for additional information.)*
- III. Other Required Hours.** A college may include courses to meet graduation or local employer requirements in a certificate, diploma, or associate in applied science 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.

	<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>

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\*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.

## *Major Hours*

*[ref. 1D SBCCC 400.97 (3)]*

- A. Core.** The subject/course core is comprised of subject areas and/or specific courses which are required for each curriculum program. 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 subject/course core of the AAS program.
- B. Concentration** *(if applicable)*. A concentration of study must include a minimum of 12 semester hours credit from required subjects and/or courses. The majority of the course credit hours are unique to the concentration. The required subjects and/or courses that make up the concentration of study are in addition to the required subject/course 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 any prefix listed, with the exception of prefixes listed in the core or concentration. 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.

### **Metal Engraving (Diploma) D30240**

	<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. CORE</b>  <b>Required Courses:</b> MEG 110 Tools, Terminology, and Procedures 4 SHC MEG 111 Scroll Cutting and Design 5 SHC MEG 114 Bolino 4 SHC MEG 115 Lettering and Calligraphy 3 SHC MEG 117 Engraving Applications 4 SHC  <b>Required Subject Areas:</b> None		<b>20 SHC</b>	
<b>B. CONCENTRATION</b> <i>(Not applicable)</i>			
<b>C. OTHER MAJOR HOURS</b> <i>To be selected from the following prefixes:</i>  ART, BUS, CIS, CSC, GRD, MEC, MEG, PCR, and WBL  <i>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.</i>			

**Curriculum Standard for Quality Assurance:  
Nondestructive Examination Technology**

**Career Cluster:** Manufacturing\*\*

**Cluster Description:** Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

**Pathway:** Quality Assurance

**Effective Term:** Fall 2013 (2013\*03)

**Program Majors Under Pathway**

<b>Program Major / Classification of Instruction Programs (CIP) Code</b>	<b>Credential Level(s) Offered</b>	<b>Program Major Code</b>
Nondestructive Examination Technology	AAS/Diploma/Certificate	A50350

**Pathway Description:** This curriculum is designed to prepare students to use scientific principles and technical skills to the operation of industrial and research testing equipment.

The course work includes mathematics, natural sciences, engineering sciences and technology.

Graduates should qualify to obtain occupations such as technical service providers, materials and technologies testing services, process improvement technicians, engineering technicians, construction technicians and managers, industrial and technology managers, or research technicians.

*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:*

**Nondestructive Examination Technology:** This course of study prepares the students to apply technical skills in nondestructive testing of materials and component parts for flaws or defects jeopardizing structural integrity. Course work includes ultrasonics, radiography, liquid penetrant, magnetic particle eddy current and visual testing methods. Applied math and physics are an integral part of NDE and the curriculum. The NDE curriculum meets the initial training requirements of ASNT's SNT-TC-1A, permitting graduates to obtain NDE certification after a few months of on-the-job experience. Career opportunities exist in applied NDE, material sciences, technical sales, and quality control in many industries.

*\*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 12/14/12; SBCC Revised: 05/17/13; Editorial Revision 08/21/13; Editorial Revision 12/10/14; CRC Revised—Electronic Only 03/12/15.*



## I. General Education Academic Core

[Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.97 (3)]: 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.

### Quality Assurance: Nondestructive Examination Technology

Recommended General Education Academic Core	AAS	Diploma	Certificate
Minimum General Education Hours Required:	15 SHC	6 SHC	0 SHC
<p>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.</p> <p>*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.</p> <p><b>Communication:</b></p> <ul style="list-style-type: none"> <li>*COM 101 Workplace Communication 3 SHC</li> <li>COM 120 Intro Interpersonal Com 3 SHC</li> <li>COM 231 Public Speaking 3 SHC</li> <li>*ENG 101 Applied Communications I 3 SHC</li> <li>*ENG 102 Applied Communications II 3 SHC</li> <li>ENG 110 Freshman Composition 3 SHC</li> <li>ENG 111 Expository Writing 3 SHC</li> <li>ENG 112 Argument-Based Research 3 SHC</li> <li>ENG 114 Prof Research &amp; Reporting 3 SHC</li> <li>ENG 116 Technical Report Writing 3 SHC</li> </ul> <p><b>Humanities/Fine Arts:</b></p> <ul style="list-style-type: none"> <li>*HUM 101 Values in the Workplace 2 SHC</li> <li>HUM 110 Technology and Society 3 SHC</li> <li>HUM 115 Critical Thinking 3 SHC</li> <li>HUM 230 Leadership Development 3 SHC</li> <li>PHI 230 Introduction to Logic 3 SHC</li> <li>PHI 240 Introduction to Ethics 3 SHC</li> </ul> <p><b>Social /Behavioral Sciences:</b></p> <ul style="list-style-type: none"> <li>ECO 151 Survey of Economics 3 SHC</li> <li>ECO 251 Prin of Microeconomics 3 SHC</li> <li>GEO 110 Introduction to Geography 3 SHC</li> <li>GEO 111 World Regional Geography 3 SHC</li> <li>GEO 131 Physical Geography I 4 SHC</li> <li>*PSY 101 Applied Psychology 3 SHC</li> <li>*PSY 102 Human Relations 2 SHC</li> <li>PSY 118 Interpersonal Psychology 3 SHC</li> <li>PSY 135 Group Processes 3 SHC</li> <li>PSY 150 General Psychology 3 SHC</li> <li>*SOC 105 Social Relationships 3 SHC</li> <li>SOC 210 Introduction to Sociology 3 SHC</li> <li>SOC 215 Group Processes 3 SHC</li> </ul> <p><b>Natural Sciences/Mathematics:</b></p> <ul style="list-style-type: none"> <li>MAT 120 Geometry and Trigonometry 3 SHC</li> <li>MAT 121 Algebra and Trigonometry I 3 SHC</li> <li>MAT 161 College Algebra 3 SHC</li> <li>MAT 171 Precalculus Algebra 3 SHC</li> <li>MAT 175 Precalculus 4 SHC</li> <li>MAT 223 Applied Calculus 3 SHC</li> <li>MAT 271 Calculus I 4 SHC</li> </ul>	<p><b>6 SHC</b></p> <p><b>3 SHC</b></p> <p><b>3 SHC</b></p> <p><b>3 SHC</b></p>	<p><b>3-6 SHC</b></p> <p><b>0-3 SHC</b></p> <p><b>0-3 SHC</b></p> <p><b>0-3 SHC</b></p>	<p><b>Optional</b></p> <p><b>Optional</b></p> <p><b>Optional</b></p> <p><b>Optional</b></p>

**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.

<i>Quality Assurance: Nondestructive Examination Technology</i>	AAS	Diploma	Certificate																																				
<b>Minimum Major Hours Required:</b>	<b>49 SHC</b>	<b>30 SHC</b>	<b>12 SHC</b>																																				
<p><b>A. Technical Core:</b>  <i>Courses required for the diploma are designated with an asterisk (*).</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">*NDE</td><td style="width: 10%;">110</td><td style="width: 70%;">Intro to Nondestr Exam</td><td style="width: 10%;">3 SHC</td></tr> <tr><td>*NDE</td><td>112</td><td>Materials and Processes</td><td>3 SHC</td></tr> <tr><td>*NDE</td><td>121</td><td>Prin of Ultrason Exam UT</td><td>4 SHC</td></tr> <tr><td>*NDE</td><td>122</td><td>Angle Beam Examination</td><td>4 SHC</td></tr> <tr><td>NDE</td><td>131</td><td>Rad Safety &amp; Prin of RT</td><td>4 SHC</td></tr> <tr><td>NDE</td><td>142</td><td>Visual Testing-1,2</td><td>2 SHC</td></tr> <tr><td>NDE</td><td>143</td><td>Liquid Penetrant Testing-1,2</td><td>2 SHC</td></tr> <tr><td>NDE</td><td>152</td><td>Magnetic Particle Testing-1,2</td><td>2 SHC</td></tr> <tr><td>NDE</td><td>153</td><td>Eddy Current Testing-1</td><td>3 SHC</td></tr> </table>	*NDE	110	Intro to Nondestr Exam	3 SHC	*NDE	112	Materials and Processes	3 SHC	*NDE	121	Prin of Ultrason Exam UT	4 SHC	*NDE	122	Angle Beam Examination	4 SHC	NDE	131	Rad Safety & Prin of RT	4 SHC	NDE	142	Visual Testing-1,2	2 SHC	NDE	143	Liquid Penetrant Testing-1,2	2 SHC	NDE	152	Magnetic Particle Testing-1,2	2 SHC	NDE	153	Eddy Current Testing-1	3 SHC	<b>27 SHC</b>	<b>14 SHC</b>	
*NDE	110	Intro to Nondestr Exam	3 SHC																																				
*NDE	112	Materials and Processes	3 SHC																																				
*NDE	121	Prin of Ultrason Exam UT	4 SHC																																				
*NDE	122	Angle Beam Examination	4 SHC																																				
NDE	131	Rad Safety & Prin of RT	4 SHC																																				
NDE	142	Visual Testing-1,2	2 SHC																																				
NDE	143	Liquid Penetrant Testing-1,2	2 SHC																																				
NDE	152	Magnetic Particle Testing-1,2	2 SHC																																				
NDE	153	Eddy Current Testing-1	3 SHC																																				
<b>B. Program Major: Not Applicable</b>																																							
<p><b>C. Other Major Hours.</b>  <i>To be selected from the following prefixes:</i></p> <p style="text-align: center;">CIS, CSC, DFT, EGR, ELC, ISC,MAC, MAT, MEC, NDE, NUC, PHY, SST, WBL, and WLD</p> <p style="text-align: center;"><i>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.</i></p>																																							

### 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>.

Summary of Required Semester Hour Credits (SHC) for each credential:

	<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>

## Curriculum Standard for Brewing, Distillation and Fermentation

**Career Cluster:** Agriculture, Food & Natural Resources\*\*

**Cluster Description:** The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources..

**Pathway:** Food Products and Processing Systems

**Effective Term:** Fall 2015 (2015\*03)

### Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code	Credential Level(s) Offered	Program Major Code
Brewing, Distillation and Fermentation	CIP Code 01.0401	AAS/Diploma/Certificate A15250

**Pathway Description:**

This curriculum is designed to prepare individuals for various careers in the brewing, distillation and fermentation industry. Classroom instruction, practical laboratory applications of brewing, distillation and fermentation principles and practices are included in the program of study.

Course work in brewing, distillation and fermentation includes production, operations, safety and sanitation, and associated process technologies. Related course work is offered in fermentation production, safety and sanitation, applied craft beverage microbiology, agriculture, marketing, management, equipment, packaging, and maintenance.

Graduates should qualify for employment opportunities in the brewing, distillation and fermentation industry. Students may be eligible to sit for the professional Institute of Brewing and Distilling (IBD) certification exams which correspond to the program of study.

*Program Major 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**:*

**Brewing, Distillation and Fermentation:** A program that prepares individuals to apply technical knowledge and skills to brew, distill and ferment various products, including beverages. Includes instruction in production of fermented products, cultivating, marketing, management, legal issues, inspection, maintenance, service and repair of equipment, facility operations, packaging, sanitation, and welding.

\*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 July 19, 2013; Editorial Revision 08/21/13; CRC Revised—Electronic Only 05/29/14; SBCC Revised 02/20/15; CRC Revised 03/12/15.

**I. General Education Academic Core**

[Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.97 (3)]: 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.

### Plant Systems: Brewing, Distillation and Fermentation

Recommended General Education Academic Core	AAS	Diploma	Certificate			
Minimum General Education Hours Required:	15 SHC	6 SHC	0 SHC			
<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>						
<b>Communication:</b>						
*COM 101 Workplace Communication 3 SHC	<b>6 SHC</b>	<b>3-6 SHC</b>	<b>Optional</b>			
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 112 Argument-Based Research 3 SHC						
ENG 114 Prof Research & Reporting 3 SHC						
ENG 115 Oral Communication 3 SHC						
ENG 116 Technical Report Writing 3 SHC						
<b>Humanities/Fine Arts:</b>						
*HUM 101 Values in the Workplace 2 SHC	<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>			
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>Social /Behavioral Sciences:</b>						
ECO 151 Survey of Economics 3 SHC	<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>			
ECO 251 Prin of Microeconomics 3 SHC						
GEO 110 Introduction to Geography 3 SHC						
GEO 111 World Regional Geography 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						
*SOC 105 Social Relationships 3 SHC						
SOC 210 Introduction to Sociology 3 SHC						
SOC 215 Group Processes 3 SHC						
<b>Natural Sciences/Mathematics:</b>						
BIO 111 General Biology I 4 SHC				<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
BIO 140 Environmental Biology 3 SHC						
BIO 160 Introductory Life Science 3 SHC						
BIO 175 General Microbiology 3 SHC						
CHM 130 Gen, Org, & Biochemistry 3 SHC						
CHM 131 Introduction to Chemistry 3 SHC						
CHM 132 Organic and Biochemistry 4 SHC						
CHM 151 General Chemistry I 4 SHC						
CHM 152 General Chemistry II 4 SHC						
*MAT 101 Applied Mathematics I 3 SHC						

MAT 110	Mathematical Measurement	3 SHC			
MAT 115	Mathematical Models	3 SHC			
MAT 120	Geometry and Trigonometry	3 SHC			
MAT 121	Algebra and Trigonometry I	3 SHC			
MAT 140	Survey of Mathematics	3 SHC			
MAT 151	Statistics I	3 SHC			
MAT 155	Statistical Analysis	3 SHC			
MAT 161	College Algebra	3 SHC			
MAT 171	Precalculus Algebra	3 SHC			
PHY 110	Conceptual Physics	3 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>Plant Systems: Brewing, Distillation and Fermentation</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>
<p><b>A. Technical Core:</b>  <i>Courses required for the diploma are designated with an asterisk (*).</i></p> <p>* BDF 110 Fermentation Production 4 SHC  * BDF 111 BDF Safety and Sanitation 2 SHC  * BDF 115 Applied Craft Bev Microbiology 4 SHC  * BDF 125 Bev Tech &amp; Calculations 2 SHC</p> <p><b>*Agriculture/Sustainability (Choose one)</b>  AGR 139 Intro to Sustainable Ag 3 SHC  AGR 160 Plant Science 3 SHC  HOR 245 Hor Specialty Crops 3 SHC  SST 110 Intro to Sustainability 3 SHC</p> <p><b>*Business/Entrepreneurship (Choose one)</b>  BDF 261 Bev Marketing &amp; Sales 3 SHC  BUS 110 Introduction to Business 3 SHC  BUS 137 Principles of Management 3 SHC  ETR 210 Intro to Entrepreneurship 3 SHC</p> <p><b>*Facility Operations (Choose one)</b>  HRM 135 Facilities Management 3 SHC  ISC 112 Industrial Safety 2 SHC  MNT 110 Intro to Maint Procedures 2 SHC  MNT 165 Mechanical Industrial Systems 2 SHC</p>	<b>29-33</b>	<b>20-21</b>	

<p><b>Required Subject Areas: Select one pathway</b></p> <p><b><i>Specialty Agriculture for Fermentation</i></b>  BDF 210 Hops Selection and Production 4 SHC  HOR 162 Applied Plant Science 3 SHC  HOR 166 Soils &amp; Fertilizers 3 SHC</p> <p><b><i>Brewing Production, Marketing and Management</i></b>  BDF 215 Legal Issues-Fermentation 3 SHC  HRM 220 Cost Control-Food &amp; Bev 3 SHC  HRM 225 Beverage Management 3 SHC</p> <p><b><i>Brewing Equipment, Packaging and Maintenance</i></b>  BDF 236 Brewing/Packaging Maintenance 4 SHC</p> <p><b><i>Choose One:</i></b>  ATR 112 Intro to Automation 3 SHC or  ELC 128 Intro to PLC 3 SHC or  ELN 260 Prog Logic Controllers 4 SHC</p> <p><b><i>Choose One:</i></b>  HYD 110 Hydraulics/Pneumatics I 3 SHC or  WLD 214 Sanitary Welding 4 SHC</p> <p><b>B. Program Major: Not Applicable</b></p>			
<p><b>C. Other Major Hours.</b>  <b><i>To be selected from the following prefixes:</i></b>  ACC, AGR, AHR, ALT, ATR, BDF, BIO, BPA, BPM, BTC, BUS, CHM, CIS, CSV, CTS, CUL, DBA, ECO, EGR, ELC, ELN, ENV, ETR, FPR, FST, HOR, HRM, HYD, ISC, LBT, LOG, MAC, MEC, MKT, MNT, OMT, PCI, PKG, PLU, REF, SST, TAT, VEN, WBL, WEB, and WLD</p> <p><i>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.</i></p>			

### 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>.

Summary of Required Semester Hour Credits (SHC) for each credential:

	<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>



# CURRICULUM STANDARD

Effective Term  
Fall 2015  
[2015\*03]

Curriculum Program Title	<b>Web Technologies</b>	Program Code	<b>A25290</b>
Concentration	<b>(not applicable)</b>	CIP Code	<b>11.0401</b>

## *Curriculum Description*

The Web Technologies curriculum prepares graduates for careers in the information technology arena using computers and mobile devices to disseminate and collect information via the Internet.

Course work in this program covers the terminology and use of computers, Internet-ready devices, servers, databases, programming languages, as well as Internet applications, site development and design. Studies will provide opportunity for students to learn related industry standards.

Graduates should qualify for career opportunities as designers, administrators, or developers in the areas of Internet and mobile applications, websites, web services, and related areas of Internet technologies.

## *Curriculum Requirements\**

*[for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.97 (3)]*

- I. General Education.** 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.
- 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. *(See second page for additional information.)*
- III. Other Required Hours.** A college may include courses to meet graduation or local employer requirements in a certificate, diploma, or associate in applied science 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.

	<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>

*\*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.*

# Major Hours

[ref. 1D SBCCC 400.97 (3)]

- A. Core.** The subject/course core is comprised of subject areas and/or specific courses which are required for each curriculum program. 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 subject/course core of the AAS program.
- B. Concentration.** A concentration of study must include a minimum of 12 semester hours credit from required subjects and/or courses. The majority of the course credit hours are unique to the concentration. The required subjects and/or courses that make up the concentration of study are in addition to the required subject/course 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 any prefix listed, with the exception of prefixes listed in the core or concentration. 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.

## Web Technologies A25290

	AAS	Diploma	Certificate
<b>Minimum Major Hours Required</b>	<b>49 SHC</b>	<b>30 SHC</b>	<b>12 SHC</b>
<b>A. CORE</b> <i>A diploma offered under this AAS degree requires a minimum of 12 SHC extracted from the required subject/course core of the AAS degree.</i>  <b>Required Courses:</b> CIS 115 Intro to Programming and Logic 3 SHC DBA 110 Database Concepts 3 SHC WEB 110 Internet/Web Fundamentals 3 SHC WEB 115 Web Markup and Scripting 3 SHC WEB 210 Web Design 3 SHC WEB 250 Database Driven Websites 3 SHC  Select Additional 9 SHC from WEB courses 9 SHC  <b>Required Subject Areas:</b> <b>Business/IT Project Management. Select one:</b> BUS 110 Introduction to Business 3 SHC BUS 137 Principles of Management 3 SHC BUS 151 People Skills 3 SHC BUS 280 REAL Small Business 4 SHC CTS 115 Info Sys Business Concepts 3 SHC CTS 240 Project Management 3 SHC ETR 210 Intro to Entrepreneurship 3 SHC <b>Networking/Security Concepts. Select one:</b> NET 110 Networking Concepts 3 SHC NET 125 Networking Basics 3 SHC SEC 110 Security Concepts 3 SHC WEB 240 Internet Security 3 SHC <b>Web Development/Multimedia. Select one:</b> DME 110 Intro to Digital Media 3 SHC WEB 120 Intro to Internet Multimedia 3 SHC WEB 140 Web Development Tools 3 SHC	<b>36-37 SHC</b>	<b>12 SHC</b>	
<b>B. CONCENTRATION</b> <i>(Not applicable)</i>			
<b>C. OTHER MAJOR HOURS</b> <i>To be selected from the following prefixes: ACC, BUS, CCT, CJC, CIS, CSC, CTI, CTS, DBA, DFT, DME, ECM, ETR, GIS, GRA, GRD, ITN, MKT, NET, NOS, OMT, OST, PHO, SEC, SGD, WBL, and WEB</i>  <i>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.</i>			