



NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

R. Scott Ralls, Ph.D.

President

MEMORANDUM

TO: Presidents
Chief Academic Officers

FROM: Wesley E. Beddard, Associate Vice President
Programs

SUBJECT: State Board Action on February 20, 2015
New and Revised Curriculum Standards

On February 20, 2015, the State Board of Community Colleges approved the requested revision to the following curriculum standard:

Brewing, Distillation and Fermentation (A15250)

Please be aware that you must implement the revised standard 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 programs.

In addition, the State Board of Community Colleges approved curriculum courses and a curriculum standard for the following new curriculum program:

Musculoskeletal Sonography (Certificate) (C45850)

Tier IA funding classification for the new Musculoskeletal Sonography (MSK) curriculum prefix has been approved.

An outline of the specific curriculum standard revision, revised curriculum standard, new courses, and new curriculum standard are attached for your convenience. You may view all curriculum standards and courses by visiting the Programs website at:

<http://www.nccommunitycolleges.edu/Programs/index.html>

If you have any questions concerning the State Board action items, please contact Jennifer Frazelle at 919.807.7120 or frazellej@nccommunitycolleges.edu.

WB/JF/gr

Attachments

c: Dr. Lisa M. Chapman
Ms. Jennifer Frazelle
Ms. Elizabeth Self
Program Coordinators

CC15-008
Email

**Outline of Curriculum Standard Revisions
State Board of Community Colleges – February 20, 2015**

Brewing, Distillation and Fermentation (A15250) Revisions:

- Added the following course to the Core:
BDF 125 Bev Tech & Calculations
- Provided a choice between the following courses instead of requiring both courses:
HYD 110 Hydraulics/Pneumatics I
WLD 214 Sanitary Welding

Musculoskeletal Sonography Courses

MSK 110 Musculoskeletal Sonography I

Class: 2 Lab: 2 Clinical: 3 Credit: 4

Prerequisites: None

Corequisites: None

This course introduces musculoskeletal (MSK) sonography. Emphasis is placed on the sonographic anatomy of the upper and lower extremities with correlated laboratory exercises. Upon completion, students should be able to recognize and acquire basic MSK images and correlate with normal anatomical structures.

MSK 111 Musculoskeletal Sonography II

Class: 1 Lab: 2 Clinical: 3 Credit: 3

Prerequisites: None

Corequisites: MSK 110

This course covers musculoskeletal (MSK) pathology recognizable on sonograms. Emphasis is placed on abnormal MSK sonograms with correlated sonographic cases. Upon completion, students should be able to recognize pathological processes seen in sonographic examinations.

MSK 112 Musculoskeletal Sonography III

Class: 2 Lab: 2 Clinical: 0 Credit: 3

Prerequisites: None

Corequisites: MSK 110

This course provides additional musculoskeletal (MSK) sonography applications which may include pediatrics and interventional studies. Emphasis is placed on interventional and pediatric applications. Upon completion, students should be able to recognize and acquire MSK images used in interventional and pediatric applications.

MSK 189 Musculoskeletal Topics

Class: 2 Lab: 0 Clinical: 0 Credit: 2

Prerequisites: None

Corequisites: MSK 110

This course provides an overview of musculoskeletal (MSK) sonography. Emphasis is placed on registry preparation. Upon completion, students should be able to demonstrate comprehensive knowledge of musculoskeletal sonography and may be eligible to take the American Registry of Diagnostic Medical Sonography MSK registry exam.

CURRICULUM STANDARD

Effective Term
Fall 2015
2015*03

Curriculum Program Title	Musculoskeletal Sonography (Certificate)	Code	C45850
Concentration	(not applicable)		CIP Code: 51.0910

Curriculum Description

The Musculoskeletal Sonography curriculum provides sonographers the didactic and clinical experience necessary to perform entry level musculoskeletal (MSK) sonography.

Course work includes introduction to normal and abnormal anatomy and physiology of the upper and lower extremities, sonographic physical principles, and the production of sonographic images of the musculoskeletal system using state of the art equipment.

Graduates may be eligible to apply to the American Registry of Diagnostic Medical Sonography (ARDMS) for national registry in Musculoskeletal Sonography. Graduates may find employment in clinics, hospitals, physicians' offices, mobile services, and educational institutions.

Individuals entering this curriculum must be registered or registry-eligible for the American Registry of Diagnostic Medical Sonography (ARDMS) or American Registry for Radiologic Technology (ARRT) exam for sonography.

Curriculum Requirements*

[for associate degree, diploma, and certificate programs in accordance with ID 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
Total Semester Hours Credit (SHC)	64-76	36-48	12-18

*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.

Musculoskeletal Sonography (Certificate) C45850

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE Required Courses: MSK 110 Musculoskeletal Sonography I 4 SHC MSK 111 Musculoskeletal Sonography II 3 SHC MSK 112 Musculoskeletal Sonography III 3 SHC MSK 189 Musculoskeletal Topics 2 SHC SON 111 Sonographic Physics 4 SHC			16 SHC
B. CONCENTRATION <i>(Not applicable)</i>			
C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> MED, MSK, and SON <i>Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 2 semester hours of credit.</i>			

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 4th 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.

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>						
Communication:						
*COM 101 Workplace Communication 3 SHC	6 SHC	3-6 SHC	Optional			
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						
Humanities/Fine Arts:						
*HUM 101 Values in the Workplace 2 SHC	3 SHC	0-3 SHC	Optional			
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						
Social /Behavioral Sciences:						
ECO 151 Survey of Economics 3 SHC	3 SHC	0-3 SHC	Optional			
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						
Natural Sciences/Mathematics:						
BIO 111 General Biology I 4 SHC				3 SHC	0-3 SHC	Optional
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.

Plant Systems: Brewing, Distillation and Fermentation	AAS	Diploma	Certificate
Minimum Major Hours Required:	49 SHC	30 SHC	12 SHC
A. Technical Core: <i>Courses required for the diploma are designated with an asterisk (*).</i> <ul style="list-style-type: none"> * BDF 110 Fermentation Production 4 SHC * BDF 111 BDF Safety and Sanitation 4 SHC * BDF 115 Applied Craft Bev Microbiology 4 SHC * BDF 125 Bev Tech & Calculations 2 SHC *Agriculture/Sustainability (Choose one) <ul style="list-style-type: none"> 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 *Business/Entrepreneurship (Choose one) <ul style="list-style-type: none"> BDF 261 Bev Marketing & Sales 3 SHC BUS 110 Introduction to Business 3 SHC BUS 137 Principles of Management 3 SHC ETR 210 Intro to Entrepreneurship 3 SHC *Facility Operations (Choose one) <ul style="list-style-type: none"> 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 	29-33	20-21	

<p>Required Subject Areas: Select one pathway</p> <p><i>Specialty Agriculture for Fermentation</i> BDF 210 Hops Selection and Production 4 SHC HOR 162 Applied Plant Science 3 SHC HOR 166 Soils & Fertilizers 3 SHC</p> <p><i>Brewing Production, Marketing and Management</i> BDF 215 Legal Issues-Fermentation 3 SHC HRM 220 Cost Control-Food & Bev 3 SHC HRM 225 Beverage Management 3 SHC</p> <p><i>Brewing Equipment, Packaging and Maintenance</i> BDF 236 Brewing/Packaging Maintenance 4 SHC</p> <p><i>Choose One:</i> 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><i>Choose One:</i> HYD 110 Hydraulics/Pneumatics I 3 SHC or WLD 214 Sanitary Welding 4 SHC</p> <p>B. Program Major: Not Applicable</p>			
<p>C. Other Major Hours. <i>To be selected from the following prefixes:</i></p> <p>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 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