



NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

R. Scott Ralls, Ph.D.

President

June 18, 2014

To: Presidents
Chief Academic Officers

From: Wesley Beddard, Associate Vice President
Student Learning and Success

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 Summer 2014 CRC meeting, held on May 29, 2014, 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 5/29/14*”, since only the electronic version of the standard template will be revised.

- Biopharmaceutical Technology (A20180)
- Computer Information Technology (A25260)
- Health Information Technology (A45360)
- Information Systems Security (A25270)
- Information Systems Security/Security Hardware (A2527B)
- Marine Technology (A15320)
- Networking Technology (A25340)

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 of CRC-approved changes to one or more core courses:

Aquaculture Technology (A15120)	Medical Dosimetry (D45450)
Chemical Technology (A20120)	Professional Crafts: Fiber (A30320)

The following curriculum standard involved CRC approved core course revisions **and additional standard revision requests** that will be presented at the July State Board meeting:

Interventional Cardiac and Vascular Technology (A45410)

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.

Business Administration Alignment Project (BAAP)

In addition to traditional course requests, the CRC approved thirty-four course revisions that were submitted as part of the Business Administration Alignment Project (BAAP). These courses are reflected on a separate log.

The following curriculum standard revisions, proposed by the BAAP participants, will be taken to the State Board for additional action in July and August:

Business Administration (A25120)
Business Administration/Shooting & Hunting Sports Mgt (A2512J)(Convert to Stand-Alone)
Business Administration Concentrations (A2512A/B/C/D/F/G/H/I/K)(Request to Archive)
Global Logistics Tech (A25170) & Business Administration/Logistics Mgt (A2512E)
(Request to archive both and convert to a new standard):
Global Logistics and Distribution Management Technology (A25xxx)

Student Learning Outcomes have been added to BUS 110 and BUS 137. The approved revision for BUS 115 was a change to the course description and the addition of Student Learning Outcomes. BUS 110, 115 and 137 are core courses for 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 5/29/14*", since only the electronic version of the standard template will be revised. These standards can be located at <http://www.nccommunitycolleges.edu/programs>:

Accounting (A25100)	Healthcare Business Informatics (A25510)
Automotive Management (A60320)	Health Information Technology (A45360)
Brewing, Distillation & Fermentation (A15250)	Information Systems Security (A25270)
Business Analytics (A25350)	Info. Sysys Security/Security Hrdware (A2527B)
Cancer Information Management (A45130)	Motorsports Mgt. Tech. (A60270)
Computer Information Technology (A25260)	Networking Technology (A25340)
Computer Programming (A25130)	Office Admin/Legal (A2537A)
Database Management (A25150)	Project Management Technology (A25390)
Entrepreneurship (A25490)	Real Estate Appraisal (A25420)
Equine Business Technology (A15170)	Swine Management Technology (A15150)
Financial Services (A25330)	Web Technologies (A25290)

In addition, the CRC took action upon the following items:

Student Learning Outcomes:

The CRC is in the process of reviewing criteria for Student Learning Outcomes, therefore the CRC has suspended college requests for new or revised Student Learning Outcomes until defined SLO criteria is developed. Student Learning Outcomes that are submitted as part of a Curriculum Improvement Project or an Alignment Project will still be considered by the Curriculum Review Committee during the hiatus.

MAT 001 Math Skills Support Clarification

The CRC approved the *MAT 001 Math Skills Support* course on February 27, 2014. At the May CRC meeting, the following statement, which will be placed as an information statement under the existing version of MAT 001 in the *Combined Course Library*, was approved as clarification of the intent for MAT 001.

MAT 001 is a supplemental lab for students in their first gateway math course. Colleges may choose to require this co-requisite for students who bypassed placement testing under the Multiple Measures for Placement policy as identified by college-established criteria.

In addition, the CRC received an information item that noted that Colleague functionality has been added that would enable colleges to add a local suffix to indicate the appropriate corequisite course for MAT 001 and that the following comment has been added to the course in the CCL:

Colleges may utilize the following letter suffixes to designate the specific corequisite math course:

MAT 001M for MAT 110 Math Measurement & Literacy

MAT 001P for MAT 171 Precalculus Algebra;

MAT 001Q for MAT 143 Quantitative Literacy;

MAT 001S for MAT 152 Statistical Methods I

MAT 001T for MAT 121 Algebra/Trigonometry I

The title of Math Skills Support should not be altered.

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 or (919) 807-7120.

WB/dm

Attachments

c: Curriculum Review Committee

Dr. Lisa Chapman

Ms. Elizabeth Self

Ms. Cynthia Liston

Ms. Jennifer Frazelle

Program Coordinators

Business Administration Alignment Project (BAAP)

Course Requests Approved by Curriculum Review Committee - (Effective Fall 2015)

Course #	Current Course Title	Action	Curriculum Standard Core Course
BAF-110	Principles of Banking	Student Learning Outcomes added	A25350, A25510, A25340, A25260, A15250, A15120, A25290, A2527B, A25280, A25150, A25130, A25490, A2512A*
BAF-131	Fund of Bank Lending	Student Learning Outcomes added	A2512A*
BAF-141	Law & Banking: Principles	Student Learning Outcomes added	A2512A*
BAF-222	Money & Banking	Student Learning Outcomes added	A2512A*
BUS-110	Introduction to Business	Student Learning Outcomes added	A25350, A25510, A25340, A25260, A15250, A15120, A25290, A2527B, A25270, A25150, A25130, A25490
BUS-115	Business Law	Course Description Revised Student Learning Outcomes added	A25120* (A2512A-I, K*), A25390, A2537A, A25330, A25420, A25100
BUS-116	Business Law II	Course Description Revised	NA
BUS-137	Principles of Management	Student Learning Outcomes added	A25120* (A2512A-I, K*) A15250, A15170, A15150, A45360, A25290, A45130, A25390, A25420, A60320, A60270
ECM-168	Electronic Business	Couse Prefix changed to BUS	A2512I*
BUS-217	Employment Laws and Regs	Student Learning Outcomes added	A2512C*
BUS-234	Training and Development	Student Learning Outcomes added	A2512C*
BUS-256	Recruit Select & Per Plan	Student Learning Outcomes added	A2512C*
BUS-258	Compensation and Benefits	Student Learning Outcomes added	A2512C*
BUS-259	HRM Applications	Student Learning Outcomes added	A2512C*
IEC-225	International Shipping	Student Learning Outcomes added	A2512K*
IEC-226	Intro to Export Admin Reg	Student Learning Outcomes added	A2512K*
IEC-227	Elec Import/Export Doc	Student Learning Outcomes added	A2512K*
IEC-228	Importing	Student Learning Outcomes added	A2512K*
INT-110	International Business	Student Learning Outcomes added	A2512D*
INT-210	International Trade	Student Learning Outcomes added	A2512D*
INT-220	International Economics	Student Learning Outcomes added	A2512D*
INT-230	International Law	Student Learning Outcomes added	A2512D*
MKT-120	Principles of Marketing	Student Learning Outcomes added	A25120* (A2512A-I, K)*
MKT-123	Fundamentals of Selling	Student Learning Outcomes added	NA

Course #	Current Course Title	Action	Curriculum Standard Core Course
MKT-220	Advertising and Sales Promotio	Student Learning Outcomes added	A2512F*, A2512J*
MKT-225	Marketing Research	Student Learning Outcomes added	A2512F*
MKT-227	Marketing Applications	Student Learning Outcomes added	A2512F*
MKT-232	Social Media Marketing	Student Learning Outcomes added	NA
OMT-112	Materials Management	Student Learning Outcomes added	A2512G*
OMT-260	Issues in Operations Mgt.	Student Learning Outcomes added	A2512G*
PAD-151	Intro to Public Admin	Student Learning Outcomes added	A2512H*
PAD-152	Ethics in Government	Student Learning Outcomes added	A2512H*
PAD-251	Public Finance & Budgeting	Student Learning Outcomes added	A2512H*
PAD-252	Public Policy Analysis	Student Learning Outcomes added	A2512H*

***Curriculum Standards for Additional State Board Action for BAAP**

A request will be sent to the State Board for action in July and August to archive the following curriculum standards. If approved, “unique/concentration” course restrictions as indicated on the concentration curriculum standards will be removed which will allow colleges to utilize these previously restricted courses in other programs.

*Business Admin./Banking & Finance (A2512A)
 Business Admin./Customer Service (A2512B)
 Business Admin./Electronic Commerce (A2512I)
 Business Admin./Human Resourc Mgt (A2512C)
 Business Admin./Import Export Comp.(A2512K)*

*Business Admin/International Bus. (A2512D)
 Business Admin/Mkting & Retailing (A2512F)
 Business Admin/Operations Mgt (A2512G)
 Business Admin/Public Admin (A2512H)*

A request will be sent to the State Board for action in July and August to revise the following curriculum standards.

*Business Administration (A25120)
 Business Administration/Shooting and Hunting Sports Mgt (A2512J)(Convert to a stand-alone)*

A request will be sent to the State Board for action in July and August to archive the following two curriculum standards and convert them into a new standard titled, Global Logistics and Distribution Management Technology (A25xxx):

Business Admin/Logistics Mgt (A2512E)

Global Logistics Technology (A25170)

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
on May 29, 2014**

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
AQU 280	Aquaculture Project	Change course hours from 0-6-3" to "0-6-2" Change prerequisites from "AQU 112" to "BIO 111"	Summer 2015 (2015*02)	Aquaculture Technology (A15120)
CTC 230	Organic Chemistry II	Change course title to "Biochemistry" Change prerequisite from "CTC 220" to "CTC 140"	Fall 2014 (2014*03) Early Implement	Chemical Technology (A20120)
CTC 240	Industrial Analysis I	Change course title to "Instru I:Spectroscopy"	Fall 2014 (2014*03) Early Implement	Chemical Technology (A20120)
CTC 250	Industrial Analysis II	Change course title to "Instru II:Chromatography" Change prerequisites from "CTC 240 to CTC 140"	Fall 2014 (2014*03) Early Implement	Chemical Technology (A20120)
CTI 260	Data Center Troubleshooting	New CCL course	Fall 2014 (2014*03)	NA
CTI 270	Data Center Design & Prob Resol	New CCL course	Fall 2014 (2014*03)	NA
DMA 060	Polynomial/Quadratic Appl	Change course description, competencies and Student Learning Outcomes	Fall 2014 (2014*03) Early Implement	NA
DMA 070	Rational Express/Equation	Change course description, competencies and Student Learning Outcomes	Fall 2014 (2014*03) Early Implement	NA
DMA 080	Radical Express/Equation	Change course description, competencies and Student Learning Outcomes	Fall 2014 (2014*03) Early Implement	NA
DOS 240	Clinical Education I	Change course hours from "0-0-24-8" to "0-0-15-5"	Fall 2014 (2014*03) Early Implement	Medical Dosimetry (D45450)
DOS 242	Clinical Education III	Change course hours from "0-0-15-5" to "0-0-24-8"	Fall 2014 (2014*03) Early Implement	Medical Dosimetry (D45450)

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
on May 29, 2014**

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
ENV 220	Applied Ecology	Change prerequisites from "Take one group: Set 1: BIO 111 and ENV 110" or Set 2: BIO 111, BIO 140 and BIO 140A " to Take one group: Set 1:ENV 110 and BIO 111, Set 2:ENV 110 and BIO 110, or Set 3 BIO 111, BIO 140 and BIO 140A"	Fall 2014 (2014*03) Early Implement	NA
GRD 273	New Media Design Communication	New CCL course	Fall 2014 (2014*03)	NA
HIT 210	Healthcare Statistics	Change prerequisites from "MAT 110" to "MAT 110 or MAT 143"	Fall 2014 (2014*03) Early Implement	Health Information Technology (A45360)
ICV 110	Patient Care/Fundamentals	Change course description	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 112	ICV Ionizing RAD Effects	Change corequisites from "None" to "ICV 111"	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 113	Inter Neuro Radiography	Change title from "Inter Neuro Radiography" to "ICV Neurovascular Procedures"	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 114	ICV Physics I	Archive Course	End Term Summer 2015 (2015*02)	Inverventional Cardiac and Vascular Technology (A45410)
ICV 118	Cardiology Procedures I	New CCL course	Fall 2014 (2014*03)	NA
ICV 120	ICV Clinical Ed I	Change course description Change corequisites from "None" to "ICV 111"	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
on May 29, 2014**

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
ICV 125	ICV Clinical Ed II	Change course description Change prerequisites from "None" to "ICV 111"	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 130	ICV Clinical Ed III	Change course description	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 212	ICV Imaging Physics	New CCL course	Fall 2014 (2014*03)	NA
ICV 214	ICV Physics II	Archive Course	End Term Summer 2015 (2015*02)	Inverventional Cardiac and Vascular Technology (A45410)
ICV 215	ICV Quality Assurance	Archive Course	End Term Summer 2015 (2015*02)	Inverventional Cardiac and Vascular Technology (A45410)
ICV 216	ICV Pharmacology	Change course description	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 217	Inter Equip & Supplies	Change course description	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 218	Cardiac Physiology & Proc	Change course description, Change prerequisites from "None" to "ICV 118" Change title to "Cardiology Procedures II" Change course hours from "3-0-0-3" to "1-2-0-2"	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
on May 29, 2014**

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
ICV 219	Vascular Physiology & Proc	Change course description Change corequisites from "None" to "ICV 113"	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 220	ICV Clinical Ed IV	Change course description	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
ICV 230	ICV Clinical Ed V	Change course description	Fall 2014 (2014*03) Early Implement	Inverventional Cardiac and Vascular Technology (A45410)
MAT 001	Skills Support	Add informational comment to clarify intent	Added comment to existing version of course (2014*02)	NA
MSC 114	Training Cruise III	Change prerequisite from "MSC 112" to "MSC 110 or "MSC 112"	Summer 2015 (2015*02)	Marine Technology (A15320)
MSC 216	Training Cruise IV	Change prerequisite from "MSC 114" to "MSC 110 and MSC 114) or (MSC 112 and MSC 114) and MSC 152"	Summer 2015 (2015*02)	NA
MSC 218	Training Cruise V	Change prerequisite from "MSC 216" to "(MSC 114 or MSC 216) and MSC 152"	Summer 2015 (2015*02)	NA
NOS 230	Windows Admin I	Change prerequisite from "NOS 130" to "None"	Fall 2014 (2014*03) Early Implement	Computer Information Technology (A25260) Information Systems Security (A25270) Information Systems Securitys Security/Security Hardware (A2527B) Networking Technology (A25340)
NUR 215	Paramedic/RN Bridge Concepts	New CCL course	Fall 2014 (2014*03)	NA
PCF 211	Production Methods for Textiles	Change course hours from "2- 15-7" to "2-12-6"	Summer 2015 (2015*02)	Professional Crafts:Fiber (A30320)
PCF 213	Professional Textiles	Change course hours from "2- 15-7" to "2-10-7"	Summer 2015 (2015*02)	Professional Crafts:Fiber (A30320)
PTC 120	Pharmaceutical Quality Control	Change prerequisite from "MAT 121 and PTC 110" to "PTC 110"	Fall 2014 (2014*03) Early Implement	Biopharmaceutical Technology (A20180)

**Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
on May 29, 2014**

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
REF 131	Ind Ammonia Refrig Safety Mgmt	New CCL course	Fall 2014 (2014*03)	NA
REF 132	Ind. Ammonia Refrigeration I	New CCL course	Fall 2014 (2014*03)	NA
REF 133	Ind Ammonia Refrigeration II	New CCL course	Fall 2014 (2014*03)	NA
REF 134	Ind Refrig Troubleshoot/Maint	New CCL course	Fall 2014 (2014*03)	NA
RTT 130	Radiation Physics for Oncology	New CCL course	Fall 2014 (2014*03)	NA
SEC 240	Wireless Security	Change prerequisite from "SEC 110 and NET 175" to "None"	Summer 2015 (2015*02)	NA

CURRICULUM STANDARD

Effective Term
Summer 2006
[2006*02]

Curriculum Program Title

Information Systems Security

Code

A2527B

Concentration

Security Hardware

CIP Code: 11.1003

Curriculum Description

Security Hardware is a concentration under the curriculum title of Information Systems Security. This curriculum covers a broad expanse of technology concepts. This curriculum provides individuals with the skills required to implement effective and comprehensive information network security controls.

Course work includes advanced networking technologies, operating systems administration, information security policy, intrusion detection, firewall technologies, information assurance, security administration, and industry best practices to protect data communications.

Graduates should be prepared for employment as network security specialists, network administrators, or security administrators. Additionally, they will acquire the skills that allow them to pursue hardware, advanced networking and security certifications.

*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
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.

Information Systems Security/Security Hardware A2527B

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <i>Courses restricted to this curriculum are designated with ***</i> Required Courses: <ul style="list-style-type: none"> CIS 115 Intro to Prog & Logic 3 SHC DBA 110 Database Concepts 3 SHC NET 125 Networking Basics 3 SHC NET 126 Routing Basics 3 SHC NOS 110 Operating System Concepts 3 SHC NOS 130 Window Single User 3 SHC SEC 110 Security Concepts 3 SHC SEC 150 Secure Communications 3 SHC SEC 160 Secure Admin I 3 SHC SEC 210 Intrusion Detection 3 SHC *** SEC 220 Defense-in-Depth 3 SHC *** SEC 289 Security Capstone Project 3 SHC Required Subject Areas: Basic Computer Skills. Select one: <ul style="list-style-type: none"> CIS 110 Introduction to Computers 3 SHC CIS 111 Basic PC Literacy 2 SHC Business. Select one: <ul style="list-style-type: none"> BUS 110 Introduction to Business 3 SHC CTS 115 Info Sys Business Concepts 3 SHC Operating Systems. Select one: <ul style="list-style-type: none"> NOS 120 Linux/UNIX Single User 3 SHC NOS 230 Windows Admin I 3 SHC 	44-45 SHC	NR	NR
Continued on next page			

Information Systems Security/Security Hardware A2527B

<p>B. CONCENTRATION <i>(not applicable)</i> <i>Courses unique to a concentration are designated with **</i></p> <p>NET 225 Routing & Switching I 3 SHC NET 226 Routing & Switching II 3 SHC ** SEC 270 Secure Routing/Firewalls 3 SHC ** SEC 275 Advanced Firewalls 4 SHC</p>	13 SHC	NR	NR
<p>C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i></p> <p>BUS, CCT, CET, CIS, CJC, COE, CSC, CTI, CTS, DBA, ITN, NET, NOS, SEC, TNE, *WBL, and WEB</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> <p><i>*WBL prefix will be available in fall 2014.</i></p>			

CURRICULUM STANDARD

Effective Term
Fall 2014
2014*03

Curriculum Program Title

Chemical Technology

Code

A20120

Concentration

(not applicable)

CIP Code: 41.0301

Curriculum Description

The Chemical Technology curriculum prepares individuals for work as analytical technicians in chemical laboratories associated with chemical production, environmental concerns, pharmaceuticals, or general analysis.

Course work includes general chemistry, organic chemistry, introductory chemical engineering, qualitative analysis, and quantitative analysis, including such instrumental techniques as spectroscopy (UV-Vis, IR, AA) and chromatography (GC, LC). Students also utilize computerized data collection, reduction, and graphic presentation.

Graduates should qualify as entry-level chemical laboratory technicians. Their duties may include chemical solution preparation; raw material, product, or environmental sampling; and/or sample testing via wet chemistry or instrumental techniques.

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
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.

Chemical Technology A20120

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <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> Required Courses: CTC 111 Basic Chemistry I 7 SHC CTC 112 Basic Chemistry II 7 SHC CTC 120 Organic Chemistry I 2 SHC CTC 140 Organic Processes 7 SHC CTC 220 Organic Chemistry II 6 SHC CTC 230 Biochemistry 5 SHC CTC 240 Instru I: Spectroscopy 5 SHC CTC 250 Instru II: Chromatography 5 SHC Required Subject Areas: None	44 SHC	12 SHC	
B. CONCENTRATION <i>(Not applicable)</i>			
C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> BIO, CHM, CIS, COE, CSC, CTC, CTS, HEA, ISC, MSC, PHY, SST 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

Effective Term
Fall 2011
[2011*03]

Curriculum Program Title

Biopharmaceutical Technology

Code

A20180

Concentration

(not applicable)

CIP Code: 15.0612

Curriculum Description

The Biopharmaceutical Technology curriculum is designed to prepare individuals for employment in pharmaceutical manufacturing and related industries. Major emphasis is placed on manufacturing processes and quality assurance procedures.

Course work includes general education, computer applications, biology, chemistry, industrial safety, and an extensive array of very detailed pharmaceutically specific classes.

Graduates should qualify for numerous positions within the industry. Employment opportunities include, but are not limited to, the following: Chemical Quality Assurance, Microbiological Quality Assurance, Product Inspection, Documentation Review, Manufacturing, and Product/Process Validation.

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
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.

Biopharmaceutical Technology A20180

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <i>Courses required for the diploma are designated with *</i> Required Courses: * CHM 131 Introduction to Chemistry 3 SHC * CHM 131A Introduction to Chemistry Lab 1 SHC * CHM 132 Organic and Biochemistry 4 SHC * PTC 110 Industrial Environment 3 SHC * PTC 120 Pharmaceutical Quality Control 4 SHC BPM 110 Bioprocess Practices 5 SHC Required Subject Areas: *Biology. Select one: BIO 110 Principles of Biology 4 SHC BIO 111 General Biology I 4 SHC	24 SHC	19 SHC	
B. CONCENTRATION <i>(Not applicable)</i>			
C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> BIO, BPM, CHM, CIS, COE, CSC, ENV, ISC, PTC, 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> <i>*WBL prefix will be available in fall 2014.</i>			

CURRICULUM STANDARD

Effective Term
Spring 2006
*[2006*01]*

Curriculum Program Title	Computer Information Technology	Code	A25260
Concentration	(not applicable)		<i>CIP Code: 11.0103</i>

Curriculum Description

The Computer Information Technology curriculum is designed to prepare graduates for employment with organizations that use computers to process, manage, and communicate information. This is a flexible curriculum that can be customized to meet community information systems needs.

Course work will develop a student's ability to communicate complex technical issues related to computer hardware, software, and networks in a manner that computer users can understand. Classes cover computer operations and terminology, operating systems, database, networking, security, and technical support.

Graduates should qualify for employment in entry-level positions with businesses, educational systems, and governmental agencies which rely on computer systems to manage information. Graduates should be prepared to sit for industry-recognized certification exams.

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
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.

Computer Information Technology A25260

	AAS	Diploma	Certificate																																													
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC																																													
<p>A. CORE <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></p> <p>Required Courses:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;">CIS 115</td><td style="width: 65%;">Intro to Programming and Logic</td><td style="width: 20%; text-align: right;">3 SHC</td></tr> <tr><td>CTS 120</td><td>Hardware/Software Support</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>CTS 285</td><td>Systems Analysis & Design</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>CTS 289</td><td>Systems Support Project</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>DBA 110</td><td>Database Concepts</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NOS 110</td><td>Operating System Concepts</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NOS 130</td><td>Windows Single User</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NOS 230</td><td>Windows Admin I</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>SEC 110</td><td>Security Concepts</td><td style="text-align: right;">3 SHC</td></tr> </table> <p>Required Subject Areas:</p> <p>Basic Computer Skills. Select one:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;">CIS 110</td><td style="width: 65%;">Introduction to Computers</td><td style="width: 20%; text-align: right;">3 SHC</td></tr> <tr><td>CIS 111</td><td>Basic PC Literacy</td><td style="text-align: right;">2 SHC</td></tr> </table> <p>Business. Select one:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;">BUS 110</td><td style="width: 65%;">Introduction to Business</td><td style="width: 20%; text-align: right;">3 SHC</td></tr> <tr><td>CTS 115</td><td>Info Sys Business Concepts</td><td style="text-align: right;">3 SHC</td></tr> </table> <p>Networking. Select one:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;">NET 110</td><td style="width: 65%;">Networking Concepts</td><td style="width: 20%; text-align: right;">3 SHC</td></tr> <tr><td>NET 125</td><td>Networking Basics</td><td style="text-align: right;">3 SHC</td></tr> </table>	CIS 115	Intro to Programming and Logic	3 SHC	CTS 120	Hardware/Software Support	3 SHC	CTS 285	Systems Analysis & Design	3 SHC	CTS 289	Systems Support Project	3 SHC	DBA 110	Database Concepts	3 SHC	NOS 110	Operating System Concepts	3 SHC	NOS 130	Windows Single User	3 SHC	NOS 230	Windows Admin I	3 SHC	SEC 110	Security Concepts	3 SHC	CIS 110	Introduction to Computers	3 SHC	CIS 111	Basic PC Literacy	2 SHC	BUS 110	Introduction to Business	3 SHC	CTS 115	Info Sys Business Concepts	3 SHC	NET 110	Networking Concepts	3 SHC	NET 125	Networking Basics	3 SHC	35-36 SHC	12 SHC	
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<p>C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> ACC, BUS, CCT, CET, CIS, COE, CSC, CTI, CTS, DBA, DES, DME, ECO, ELN, GIS, GRD, HBI, HPC, MIT, NET, NOS, OMT, OST, SEC, SGD, *WBL, and WEB</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> <p><i>*WBL prefix will be available in fall 2014.</i></p>																																																

CURRICULUM STANDARD

Effective Term
Spring 2006
[2006*01]

Curriculum Program Title

Information Systems Security

Code

A25270

Concentration

(not applicable)

CIP Code: 11.1003

Curriculum Description

Information Systems Security covers a broad expanse of technology concepts. This curriculum provides individuals with the skills required to implement effective and comprehensive information security controls.

Course work includes networking technologies, operating systems administration, information policy, intrusion detection, security administration, and industry best practices to protect data communications.

Graduates should be prepared for employment as security administrators. Additionally, they will acquire the skills that allow them to pursue security certifications.

*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.

Information Systems Security A25270

	AAS	Diploma	Certificate																																																						
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC																																																						
<p>A. CORE <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></p> <p style="text-align: center;"><i>Courses restricted to this curriculum are designated with ***</i></p> <p>Required Courses:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>CIS 115</td><td>Intro to Programming and Logic</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>DBA 110</td><td>Database Concepts</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NET 125</td><td>Networking Basics</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NET 126</td><td>Routing Basics</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NOS 110</td><td>Operating System Concepts</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NOS 130</td><td>Windows Single User</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>SEC 110</td><td>Security Concepts</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>SEC 150</td><td>Secure Communications</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>SEC 160</td><td>Secure Admin I</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>SEC 210</td><td>Intrusion Detection</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>*** SEC 220</td><td>Defense-in-Depth</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>*** SEC 289</td><td>Security Capstone Project</td><td style="text-align: right;">3 SHC</td></tr> </table> <p>Required Subject Areas:</p> <p>Basic Computer Skills. Select one:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>CIS 110</td><td>Introduction to Computers</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>CIS 111</td><td>Basic PC Literacy</td><td style="text-align: right;">2 SHC</td></tr> </table> <p>Business. Select one:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>BUS 110</td><td>Introduction to Business</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>CTS 115</td><td>Info Sys Business Concepts</td><td style="text-align: right;">3 SHC</td></tr> </table> <p>Operating Systems. Select one:</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>NOS 120</td><td>Linux/UNIX Single User</td><td style="text-align: right;">3 SHC</td></tr> <tr><td>NOS 230</td><td>Windows Admin I</td><td style="text-align: right;">3 SHC</td></tr> </table>	CIS 115	Intro to Programming and Logic	3 SHC	DBA 110	Database Concepts	3 SHC	NET 125	Networking Basics	3 SHC	NET 126	Routing Basics	3 SHC	NOS 110	Operating System Concepts	3 SHC	NOS 130	Windows Single User	3 SHC	SEC 110	Security Concepts	3 SHC	SEC 150	Secure Communications	3 SHC	SEC 160	Secure Admin I	3 SHC	SEC 210	Intrusion Detection	3 SHC	*** SEC 220	Defense-in-Depth	3 SHC	*** SEC 289	Security Capstone Project	3 SHC	CIS 110	Introduction to Computers	3 SHC	CIS 111	Basic PC Literacy	2 SHC	BUS 110	Introduction to Business	3 SHC	CTS 115	Info Sys Business Concepts	3 SHC	NOS 120	Linux/UNIX Single User	3 SHC	NOS 230	Windows Admin I	3 SHC	44-45 SHC	12 SHC	
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B. CONCENTRATION (<i>not applicable</i>)																																																									

Information Systems Security A25270 (Continued)

C. OTHER MAJOR HOURS

To be selected from the following prefixes:

ACC, BUS, CCT, CET, CIS, CJC, COE, CSC, CTI, CTS, DBA, ECM, ITN,
NET, NOS, OMT, OST, SEC, TNE, *WBL, and WEB

*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.*

**WBL prefix will be available in fall 2014.*

CURRICULUM STANDARD

Effective Term
Summer 2006
[2006*02]

Curriculum Program Title

Networking Technology

Code

A25340

Concentration

(not applicable)

CIP Code: 11.0901

Curriculum Description

The Networking Technology curriculum prepares individuals for employment supporting network infrastructure environments. Students will learn how to use technologies to provide reliable transmission and delivery of data, voice, image, and video communications in business, industry, and education.

Course work includes design, installation, configuration, and management of network infrastructure technologies and network operating systems. Emphasis is placed on the implementation and management of network software and the implementation and management of hardware such as switches and routers.

Graduates may find employment in entry-level jobs as local area network managers, network operators, network analysts, and network technicians. Graduates may also be qualified to take certification examinations for various network industry certifications, depending on their local program.

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
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.

Networking Technology A25340

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <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> Required Courses: CIS 115 Intro to Prog & Logic 3 SHC CTS 120 Hardware/Software Support 3 SHC DBA 110 Database Concepts 3 SHC NET 125 Networking Basics 3 SHC NET 126 Routing Basics 3 SHC NET 225 Routing & Switching I 3 SHC NET 226 Routing & Switching II 3 SHC NOS 110 Operating Systems Concepts 3 SHC NOS 120 Linux/UNIX Single User 3 SHC NOS 130 Windows Single User 3 SHC SEC 110 Security Concepts 3 SHC Required Subject Areas: Basic Computer Skills. Select one: CIS 110 Introduction to Computers 3 SHC CIS 111 Basic PC Literacy 2 SHC Business. Select one: BUS 110 Introduction to Business 3 SHC CTS 115 Info Sys Business Concepts 3 SHC Design. Select one: NET 240 Network Design 3 SHC NET 289 Networking Project 3 SHC Operating System Administration. Select one: NOS 220 Linux/UNIX Admin I 3 SHC NOS 230 Windows Admin I 3 SHC	44-45 SHC	12 SHC	
B. CONCENTRATION (Not applicable)			

Networking Technology A25340 (Continued)

<p>C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> BUS, CCT, CET, CIS, COE, CSC, CTI, CTS, DBA, ELC, HBI, NET, NOS, OMT, SEC, SGD, TNE, *WBL, and WEB</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> <p><i>*WBL prefix will be available in fall 2014.</i></p>			
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CURRICULUM STANDARD

Curriculum Program Title

Professional Crafts: Fiber

Code

A30320

Concentration

(not applicable)

CIP Code: 50.0712

Curriculum Description

The Professional Crafts: Fiber curriculum is designed to train individuals as professional handweavers. Instruction includes technical weaving knowledge, dye work, design skills, and marketing and business essentials.

Students will learn warping techniques, weaving theory and technique, dye applications, and finishing methods. Students will receive design skills to aid them in personalizing their own work. Additional instruction will provide the bases for starting and running a small business.

Graduates will be able to open and operate their own weaving studio, work for an existing weaving business, or transfer to a four-year degree program.

*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.

Professional Crafts: Fiber A30320

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <i>Courses required for the diploma are designated with *</i> Required Courses: * PCF 110 Introduction to Weaving 7 SHC * PCF 111 Intermediate Weaving 7 SHC PCF 113 Sewing with Hand-Wovens 4 SHC PCF 211 Production Mthds/Textiles 6 SHC PCF 213 Professional Textiles 7 SHC Required Subject Areas: None	31 SHC	14 SHC	
B. CONCENTRATION (Not applicable)			
C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> ART, CIS, COE, CSC, DES, PCD, PCF, PCR, PHO, TEX, and WBL <i>Up to three semester hour credits may be selected from the following prefixes:</i> ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.			

CURRICULUM STANDARD

Effective Term
Fall 2011
[2011*03]

Curriculum Program Title	Health Information Technology	Code	A45360
Concentration	(not applicable)		CIP Code: 51.0707

Curriculum Description

The Health Information Technology curriculum provides individuals with the knowledge and skills to process, analyze, abstract, compile, maintain, manage, and report health information.

Students will supervise departmental functions; classify, code, and index diagnoses and procedures; coordinate information for cost control, quality management, statistics, marketing, and planning; monitor governmental and non-governmental standards; facilitate research; and design system controls to monitor patient information security.

Graduates of this program may be eligible to write the national certification examination to become a Registered Health Information Technician (RHIT). Employment opportunities include hospitals, rehabilitation facilities, nursing homes, health insurance organizations, outpatient clinics, physicians' offices, hospice, and mental health facilities.

*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
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. ID 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.

Health Information Technology A45360

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <i>Courses required for the diploma are designated with *</i> REQUIRED COURSES: HIT 110 Fundamentals of HIM 3 SHC * HIT 112 Health Law and Ethics 3 SHC * HIT 114 Health Data Sys/Standards 3 SHC HIT 210 Healthcare Statistics 3 SHC * HIT 211 ICD Coding 4 SHC * HIT 214 CPT/Other Coding Systems 2 SHC HIT 216 Quality Management 2 SHC HIT 280 Professional Issues 2 SHC * MED 121 Medical Terminology I 3 SHC * MED 122 Medical Terminology II 3 SHC * BIO 271 Pathophysiology 3 SHC <i>or</i> * HIT 226 Principles of Disease 3 SHC REQUIRED SUBJECT AREAS: ANATOMY & PHYSIOLOGY. Select one sequence: BIO 165 Anatomy and Physiology I 4 SHC & BIO 166 Anatomy and Physiology II 4 SHC <i>or</i> BIO 168 Anatomy and Physiology I 4 SHC & BIO 169 Anatomy and Physiology II 4 SHC MANAGEMENT. Select one: BUS 135 Principles of Supervision 3 SHC BUS 137 Principles of Management 3 SHC HIT 218 Mgmt Principles in HIT 3 SHC DIRECTED PRACTICE. Select 1-6 SHC: HIT 122 Prof Practice Exp I 1 SHC * HIT 124 Prof Practice Exp II 1 SHC * HIT 222 Prof Practice Exp III 2 SHC HIT 224 Prof Practice Exp IV 2 SHC	42-49 SHC	24 SHC	
B. CONCENTRATION (<i>Not applicable</i>)			

Health Information Technology A45360 (Continued)

C. OTHER MAJOR HOURS

To be selected from the following prefixes:

BIO, BUS, CIS, COE, CSC, CTS, DBA, HIT, HSC, MED, OST, SEC, and WBL

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.

Curriculum Standard for Animal Systems: Aquaculture Technology

Career Cluster: Agriculture, Food, and Natural Resources **

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

Pathway: Animal Systems

Effective Term: Summer 2015 (2015*02)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code	Credential Level(s) Offered	Program Major Code
Aquaculture Technology	CIP Code 01.0303	AAS/Diploma/Certificate A15120

Pathway Description:

The Aquaculture Technology curriculum prepares individuals for careers in aquaculture and management of aquatic ecosystems. It provides a broad background in science and math as well as specialized course work and practical experience in fish, shellfish, and aquatic plant production and management.

Course work includes biology, chemistry, and math, as well as water quality and limnology, nutrition and feeding, genetics and breeding, facilities construction, and business. Students will spend time working in the industry through the cooperative work experience or conducting an individualized study through the aquaculture project.

Graduates may find employment on private farms and government hatcheries or at public aquariums. Graduates may also start new businesses in fish, shellfish, or aquatic plant farming; pond and lake management services; or home/office aquarium or water garden management services.

*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**:*

Aquaculture Technology. A program that prepares individuals to select, culture, propagate, harvest, and market domesticated fish, shellfish, and marine plants, both freshwater and saltwater. Potential course work includes instruction in the basic principles of aquatic and marine biology; health and nutrition of aquatic and marine life; design and operation of fish farms, breeding facilities, culture beds, and related enterprises; and related issues of safety, applicable regulations, logistics, and supply.

*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 09/08/12; Editorial Revision 12/14/12; SBCC Revised 07/19/13; Editorial Revision 08/21/13; CRC Revised—05/29/2014.

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.

Animal Systems: Aquaculture Technology

Recommended General Education Academic Core	AAS	Diploma	Certificate
Minimum General Education Hours Required:	15 SHC	6 SHC	0 SHC
<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>			
<i>*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.</i>			
Communication:			
*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 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:			
ART 111 Art Appreciation	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		
Social /Behavioral Sciences:			
ECO 151 Survey of Economics	3 SHC		
ECO 251 Prin of Microeconomics	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 140 Environmental Biology	3 SHC		
BIO 160 Introductory Life Science	3 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/Trigonometry I	3 SHC		
MAT 140 Survey of Mathematics	3 SHC		
MAT 151 Statistics I	3 SHC		
MAT 155 Statistical Analysis	3 SHC		
MAT 171 Precalculus Algebra	3 SHC		
PHY 110 Conceptual Physics	3 SHC		
PHY 121 Applied Physics I	4 SHC		
	6 SHC	3-6 SHC	Optional
	3 SHC	0-3 SHC	Optional
	3 SHC	0-3 SHC	Optional
	3 SHC	0-3 SHC	Optional

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.

Animal Systems: Aquaculture Technology	AAS	Diploma	Certificate
Minimum Major Hours Required:	49 SHC	30 SHC	12 SHC
<p>A. Technical Core:</p> <ul style="list-style-type: none"> *AQU 111 Aquaculture I 3 SHC *AQU 220 Aquaculture Facilities 3 SHC *BIO 111 General Biology I 4 SHC *CHM 151 General Chemistry I 4 SHC <p>B. Program Major(s): Aquaculture Technology</p> <ul style="list-style-type: none"> *Culture Techniques. Choose one. <ul style="list-style-type: none"> AQU 112 Aquaculture II 3 SHC AQU 260 Aquariology 3 SHC * Business. Choose one: <ul style="list-style-type: none"> AQU 120 Aquabusiness 3 SHC BUS 110 Introduction to Business 3 SHC BUS 280 REAL Small Business 4 SHC * Culture Environment. Choose one: <ul style="list-style-type: none"> AQU 210 Limnology & Water Quality 3 SHC AQU 270 Water Gardens 3 SHC BIO 243 Marine Biology 4 SHC FWL 234 Aquatic Ecology 3 SHC Other. Choose one: <ul style="list-style-type: none"> AQU 280 Aquaculture Project 2 SHC WBL 112 Work-Based Learning I 2 SHC <p><i>Select additional courses from the AQU, BIO, BUS, or FWL prefix for a minimum of 12 SHC for the Aquaculture Technology AAS program.</i></p> <p><i>Courses required for the Aquaculture Technology Diploma are designated with *</i></p>	25-27 SHC	25-27 SHC	

C. Other Major Hours.

To be selected from the following prefixes:

ACC, AGR, AQU, ART, BIO, BTC, BUS, CHM, CIS, CSC, ECO, EGR, ETR FWL, GIS, HOR, MAT, MKT, PHY, TRF, SRV, and WBL.

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

III. Other Required Hours

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

IV. Employability Competencies

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

- A. **Interpersonal Skills and Teamwork** – The ability to work effectively with others, especially to analyze situations, establish priorities, and apply resources for solving problems or accomplishing tasks.
- B. **Communication** – The ability to effectively exchange ideas and information with others through oral, written, or visual means.
- C. **Integrity and Professionalism** – Workplace behaviors that relate to ethical standards, honesty, fairness, respect, responsibility, self-control, criticism and demeanor.
- D. **Problem-solving** – The ability to identify problems and potential causes while developing and implementing practical action plans for solutions.
- E. **Initiative and Dependability** – Workplace behaviors that relate to seeking out new responsibilities, establishing and meeting goals, completing tasks, following directions, complying with rules, and consistent reliability.
- F. **Information processing** – The ability to acquire, evaluate, organize, manage, and interpret information.
- G. **Adaptability and Lifelong Learning** – The ability to learn and apply new knowledge and skills and adapt to changing technologies, methods, processes, work environments, organizational structures and management practices.
- H. **Entrepreneurship** – The knowledge and skills necessary to create opportunities and develop as an employee or self-employed business owner.

*An **Employability Skills Resource Toolkit** has been developed by NC-NET for the competencies listed above.

Additional information is located at: <http://www.nc-net.info/employability.php>

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

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

	AAS	Diploma	Certificate
Minimum General Education Hours	15	6	0
Minimum Major Hours	49	30	12
Other Required Hours	0-7	0-4	0-1
Total Semester Hours Credit (SHC)	64-76	36-48	12-18

CURRICULUM STANDARD

Effective Term
Fall 2014
2014*03

Curriculum Program Title	Medical Dosimetry (Diploma)	Code	D45450
Concentration	(not applicable)		CIP Code: 51.0907

Curriculum Description

The curriculum is designed to prepare ARRT certified radiation therapists to work in the care of cancer patients as medical dosimetrist. The curriculum provides instruction to enable the participant to become a member of the radiation oncology team.

The curriculum content includes specific coursework to provide classroom and direct clinical experience to train the student in the fundamentals of medical dosimetry practice using current technology, tools and techniques. Students will participate in studies related to the role of the medical dosimetrist and professional ethics, radiation oncology anatomy, treatment planning, dose calculations, clinical oncology, brachytherapy, dosimetry physics, radiation protection, quality assurance and computer applications.

Graduates of the program will be able to obtain employment as a medical dosimetrist and apply to the Medical Dosimetrist Certification Board (MDCB) to sit for a national certification.

Admission criteria include the completion of a bachelors degree.

*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
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.

Medical Dosimetry (Diploma) (D45450)

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE		38 SHC	
Required Courses:			
DOS 210 Introduction to Dosimetry	2 SHC		
DOS 220 Treatment Planning I	2 SHC		
DOS 221 Treatment Planning II	2 SHC		
DOS 230 Clinical Research Exper	2 SHC		
DOS 240 Clinical Education I	5 SHC		
DOS 241 Clinical Education II	8 SHC		
DOS 242 Clinical Education III	8 SHC		
DOS 243 Dosimetry Physics	2 SHC		
DOS 250 Dose Calculations	2 SHC		
DOS 260 Brachytherapy Planning	3 SHC		
DOS 270 Medical Dosimetry Capstone	2 SHC		
B. CONCENTRATION (<i>Not applicable</i>)			
C. OTHER MAJOR HOURS			
<i>To be selected from the following prefixes:</i>			
CIS, COE, CSC, CTS, DOS, RAD, RTT, 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 Natural Resource Systems: Marine Technology

Career Cluster: Agriculture, Food, and Natural Resources **

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

Pathway: Natural Resource Systems

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code	CIP Code	Credential Level(s) Offered	Program Major Code
Marine Science	26.1302	AAS/Diploma/Certificate	A15310
Marine Technology	03.0301	AAS/Diploma/Certificate	A15320

Pathway Description:

These curricula prepare individuals for a variety of marine-related occupations such as marine conservation, water analysis, marine scientific research support and commercial fishing. Individuals will be prepared as naturalists within the ecotourism industry and be trained in observational and measurement techniques aboard a variety of vessels including ocean-going research vessels.

Course work includes a unique blend of traditional and contemporary vocational, technical, and scientific marine education. Course work specific for Marine Sciences includes instruction in biological sciences, environmental sciences, and marine sciences. Field and laboratory experiences prepare students to identify, observe, and collect scientific data associated with the fauna and flora found in the rivers, estuaries, sounds, and ocean. Course work in Marine Technologies includes instruction in the use of physical, chemical, meteorological, biological, and geological oceanographic instrumentation and sampling equipment.

Graduates are prepared for employment opportunities with aquariums, fisheries, corps of engineers, marine patrol, ecotourism companies, commercial fishing industries, entry-level field or laboratory positions with industries, state and federal agencies, and educational facilities associated with marine science and research. Career opportunities include oceanography, environmental science, marine biology, geophysical exploration, and fisheries-related employment.

*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**:*

Marine Science: A program that focuses on the scientific study of the ecology and behavior of microbes, plants, and animals inhabiting oceans, coastal waters, and saltwater wetlands and their interactions with the physical environment. Potential course work includes instruction in chemical, physical, and geological oceanography; molecular, cellular, and biochemical studies; marine microbiology; marine botany; ichthyology; mammalogy; marine population dynamics and biodiversity; reproductive biology; studies of specific species, phyla, habitats, and ecosystems; marine paleocology and palentology; and applications to fields such as fisheries science and biotechnology.

Marine Technology: A program that focuses on the scientific study of the husbandry and production of non-domesticated fish and shellfish populations for recreational and commercial purposes and the management of fishing and marine/aquatic product processing to ensure adequate conservation and efficient utilization. Potential course work includes instruction in the principles of marine/aquatic biology, freshwater and saltwater ecosystems, water resources, fishing production operations and management, fishing policy and regulation, and the management of recreational and commercial fishing activities.

*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.

I. General Education Academic Core

[Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(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.

Natural Resource Systems: Marine Technology

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> <p>Communication:</p> <ul style="list-style-type: none"> *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 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 <p>Humanities/Fine Arts:</p> <ul style="list-style-type: none"> *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 <p>Social /Behavioral Sciences:</p> <ul style="list-style-type: none"> ECO 151 Survey of Economics 3 SHC 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 <p>Natural Sciences/Mathematics:</p> <ul style="list-style-type: none"> BIO 140 Environmental Biology 3 SHC BIO 160 Introductory Life Science 3 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/Trigonometry I 3 SHC MAT 140 Survey of Mathematics 3 SHC MAT 151 Statistics I 3 SHC MAT 155 Statistical Analysis 3 SHC PHY 110 Conceptual Physics 3 SHC PHY 121 Applied Physics I 4 SHC 	<p>6 SHC</p> <p>3 SHC</p> <p>3 SHC</p> <p>3 SHC</p>	<p>3-6 SHC</p> <p>0-3 SHC</p> <p>0-3 SHC</p> <p>0-3 SHC</p>	<p>Optional</p> <p>Optional</p> <p>Optional</p> <p>Optional</p>

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, 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.

Natural Resource Systems: Marine	AAS	Diploma	Certificate																																												
Minimum Major Hours Required:	49 SHC	30 SHC	12 SHC																																												
<p>A. Technical Core:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">*MSC 122 Boat Handling/Seamanship</td> <td style="width: 10%; text-align: right;">3 SHC</td> <td rowspan="8" style="width: 10%; text-align: center; vertical-align: middle;">35 SHC</td> <td rowspan="8" style="width: 10%; text-align: center; vertical-align: middle;">12- 32 SHC</td> </tr> <tr> <td>*MSC 124 Industrial Skills</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>*MSC 132 Fishing Gear Tech I</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>*MSC 150 Marine Navigation</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>*MSC 160 Oceanography</td> <td style="text-align: right;">4 SHC</td> </tr> <tr> <td>MSC 180 Water Analysis</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>MSC 276 Marine Vertebrate Zoo</td> <td style="text-align: right;">4 SHC</td> </tr> </table> <p>B. Program Major(s):</p> <p>Marine Science <i>Select a minimum of 12 SHC from the following courses for the Marine Science AAS program:</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">BIO 111 General Biology I</td> <td style="width: 10%; text-align: right;">4 SHC</td> </tr> <tr> <td>BIO 146 Regional Natural History</td> <td style="text-align: right;">4 SHC</td> </tr> <tr> <td>BIO 243 Marine Biology</td> <td style="text-align: right;">4 SHC</td> </tr> </table> <p>Ecology. Select 4-7 SHC:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">BIO 145 Ecology</td> <td style="width: 10%; text-align: right;">4 SHC <i>or</i></td> </tr> <tr> <td>ENV 110 Environmental Science</td> <td style="text-align: right;">3 SHC <i>and</i></td> </tr> <tr> <td>ENV 220 Applied Ecology</td> <td style="text-align: right;">4 SHC</td> </tr> </table> <p><i>Select a minimum of 12 SHC from technical core or program major courses for a diploma in Marine Science.</i></p> <p>Marine Technology <i>Select a minimum of 12 SHC from the following courses for the Marine Technology AAS program:</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">*MSC 110 Training Cruise I</td> <td style="width: 10%; text-align: right;">1 SHC</td> </tr> <tr> <td>*MSC 112 Training Cruise II</td> <td style="text-align: right;">1 SHC</td> </tr> <tr> <td>*MSC 114 Training Cruise III</td> <td style="text-align: right;">1 SHC</td> </tr> <tr> <td>*MSC 126 Marine Engines</td> <td style="text-align: right;">2 SHC</td> </tr> <tr> <td>*MSC 134 Fishing Gear Technology II</td> <td style="text-align: right;">2 SHC</td> </tr> <tr> <td>*MSC 152 Marine Instrumentation</td> <td style="text-align: right;">2 SHC</td> </tr> <tr> <td>*MSC 172 Marine Biology</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>*MSC 174 Marine Invertebrate Zoo</td> <td style="text-align: right;">4 SHC</td> </tr> </table> <p><i>Courses required for the Marine Technology diploma are designated with *</i></p>	*MSC 122 Boat Handling/Seamanship	3 SHC	35 SHC	12- 32 SHC	*MSC 124 Industrial Skills	3 SHC	*MSC 132 Fishing Gear Tech I	3 SHC	*MSC 150 Marine Navigation	3 SHC	*MSC 160 Oceanography	4 SHC	MSC 180 Water Analysis	3 SHC	MSC 276 Marine Vertebrate Zoo	4 SHC	BIO 111 General Biology I	4 SHC	BIO 146 Regional Natural History	4 SHC	BIO 243 Marine Biology	4 SHC	BIO 145 Ecology	4 SHC <i>or</i>	ENV 110 Environmental Science	3 SHC <i>and</i>	ENV 220 Applied Ecology	4 SHC	*MSC 110 Training Cruise I	1 SHC	*MSC 112 Training Cruise II	1 SHC	*MSC 114 Training Cruise III	1 SHC	*MSC 126 Marine Engines	2 SHC	*MSC 134 Fishing Gear Technology II	2 SHC	*MSC 152 Marine Instrumentation	2 SHC	*MSC 172 Marine Biology	3 SHC	*MSC 174 Marine Invertebrate Zoo	4 SHC			
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C. Other Major Hours.
To be selected from the following prefixes:
 AGR, AQU, BIO, BUS, CHM, CIS, COE, CSC, DFT, ELN, ETR, ENV, HEA, FOR, FWL, GIS, HOR, REC, TRF, MAT, MSC, PED, PHO, PHY, REC, TXY, VEN, WBL, WLD, WPP and ZAS

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

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

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

- A. Interpersonal Skills and Teamwork** – The ability to work effectively with others, especially to analyze situations, establish priorities, and apply resources for solving problems or accomplishing tasks.
- B. Communication** – The ability to effectively exchange ideas and information with others through oral, written, or visual means.
- C. Integrity and Professionalism** – Workplace behaviors that relate to ethical standards, honesty, fairness, respect, responsibility, self-control, criticism and demeanor.
- D. Problem-solving** – The ability to identify problems and potential causes while developing and implementing practical action plans for solutions.
- E. Initiative and Dependability** – Workplace behaviors that relate to seeking out new responsibilities, establishing and meeting goals, completing tasks, following directions, complying with rules, and consistent reliability.
- F. Information processing** – The ability to acquire, evaluate, organize, manage, and interpret information.
- G. Adaptability and Lifelong Learning** – The ability to learn and apply new knowledge and skills and adapt to changing technologies, methods, processes, work environments, organizational structures and management practices.
- H. Entrepreneurship** – The knowledge and skills necessary to create opportunities and develop as an employee or self-employed business owner.

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

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

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

	AAS	Diploma	Certificate
Minimum General Education Hours	15	6	0
Minimum Major Hours	49	30	12
Other Required Hours	0-7	0-4	0-1
Total Semester Hours Credit (SHC)	64-76	36-48	12-18