NORTH CAROLINA COMMUNITY COLLEGE SYSTEM
Mr. George Fouts
Interim President

November 13, 2015

MEMORANDUM

To: Presidents
Chief Academic Officers

From: Wesley Beddard, Associate Vice President
Programs

Subject: Curriculum Review Committee Course Approvals

The Curriculum Review Committee (CRC) has the responsibility for maintaining the curriculum courses in the *Combined Course Library* (CCL). The approved course requests from the Fall 2015 CRC meeting, held on October 22, 2015, are attached for your information. *Course revisions may involve the removal of required prerequisites or corequisites. Please note that colleges may add local prerequisites and/or corequisites if they determine a need exists.*

Course Revision Impact to Curriculum Standards
The CRC approved requests to revise the **course description, prerequisite(s), corequisite(s), and/or class/lab hours** of core courses found on the curriculum standards listed below. Please note that the only change indicated on the printed standard will be the inclusion of the statement *"CRC Revised-Electronic Only 10/22/15"*, since only the electronic version of the standard in Colleague will be revised.

Computed Tomography and Magnetic Resonance Imaging Technology (Diploma) (D45200)
Dental Hygiene (A45260)
Surgical Technology (A45700)

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

Biomedical Equipment Technology (A50100)
Healthcare Business Informatics (A25510)
Telecommunications and Network Engineering Technology (A40400)

CC15-035
Email

Mailing Address: 5016 Mail Service Center | Raleigh, NC | 27699-5016
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Information Technology Alignment Project (ITAP)
In addition to traditional course requests, the CRC approved course requests that were submitted as part of the Information Technology Alignment Project (ITAP). These courses are reflected on a separate log.

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.

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/academic-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 M. Chapman
Ms. Elizabeth Self
Ms. Jennifer Frazelle
Program Coordinators

Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
October 22, 2015

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
ART 275	Intro to Commercial Art	Change course description, Change title to "Introduction to Graphic Design"	Fall 2016	NA
ART 276	Interactive Media Design	New CCL course	Spring 2016	NA
CAT 211	CT Procedures	Change corequisite from "CAT 210" to "None"	Spring 2016 (Early Implementation)	Computed Tomography & Magnetic Resonance Imaging Technology (D45200)
DEN 123	Nutrition/Dental Health	Change description	Spring 2016 (Early Implementation)	Dental Hygiene (A45260)
DEN 140	Dental Hygiene Theory II	Change description	Spring 2016 (Early Implementation)	Dental Hygiene (A45260)
DEN 220	Dental Hygiene Theory III	Change description	Spring 2016 (Early Implementation)	Dental Hygiene (A45260)
DEN 230	Dental Hygiene Theory IV	Change description	Spring 2016 (Early Implementation)	Dental Hygiene (A45260)
DEN 232	Community Dental Health	Change course hours from “2-0-3-3” to “2-3-0-3"	Spring 2016 (Early Implementation)	Dental Hygiene (A45260)
LEX 273	NCCP Review Course	New CCL course	Spring 2016	NA
MEG 118	Advanced Scroll Drawing	Change title to "Scroll Drawing", Change prerequisites from "MEG 111" to "None"	Fall 2016	NA
ODL 222	Minimum Impact Outdoor Skills	New CCL course	Spring 2016	NA
ODL 245	Wilderness Therapeutic Models	Change course hours from “3-2-0-4” to “2-2-0-3”	Fall 2016	NA

Curriculum Course Requests Approved By the Curriculum Review Committee (CRC)
October 22, 2015

Course Prefix #	Title	Request	Effective Semester	Curriculum Standard Core Course
ODL 248	Filed Techniques in WT	Change course hours from “2-6-0-4” to “1-6-0-3”	Fall 2016	NA
ODL 275	Advanced Swift Water Rescue	New CCL course	Spring 2016	NA
ODL 277	Technical Rope Rescue	New CCL course	Spring 2016	NA
PSG 113	PSG Instrumentation	New CCL course	Spring 2016	NA
PSG 114	PSG Clinical Education I	New CCL course	Spring 2016	NA
SUR 122	Surgical Procedures I	Change corequisites from "SUR 123 or STP 101" to "SUR 123"	Spring 2016 (Early Implementation)	Surgical Technology (A45740)
SUR 134	Surgical Procedures II	Change prerequisites from "SUR 123 or STP 101" to "SUR 123"	Spring 2016 (Early Implementation)	Surgical Technology (A45740)
*TOM 120	Introduction to Trucking	New CCL course	Spring 2016	NA
*TOM 130	Fleet Maintenance	New CCL course	Spring 2016	NA
*TOM 250	Operations of Trucking I	New CCL course	Spring 2016	NA
*TOM 260	Operations of Trucking II	New CCL course	Spring 2016	NA

***Release of TOM courses into the *Combined Course Library* is pending January State Board action.**

Information Technology Program
New and Revised Courses
Approved by Curriculum Review Committee (10/22/15)
Effective Term: Fall 2016

NEW COURSES

Course #	Current Course Title	Action Description
CSC-116	Intro to Functional Prog.	New course created (see attached)
CSC-121	Python Programming	New course created (see attached)
CSC-122	Python Application Development	New course created (see attached)
CSC-124	Intro to Data Science Prog.	New course created (see attached)
CSC-154	Software Development	New course created (see attached)
CSC-163	C# Application Development	New course created (see attached)
CSC-174	Server-Side JavaScript	New course created (see attached)
CSC-216	Software Architecture	New course created (see attached)
CSC-221	Advanced Python Programming	New course created (see attached)
CSC-226	.NET Programming	New course created (see attached)
CSC-227	Cloud Application Development	New course created (see attached)
CSC-256	Software Quality Assurance	New course created (see attached)
CTI-131	Enterprise Hardware Foundation	New course created (see attached)
CTI-175	Intro to Wireless Technology	New course created (see attached)
CTS-225	Spreadsheet Data Analysis	New course created (see attached)
DBA-125	Database Reporting	New Course created (see attached)
DBA-130	Intro to noSQL Databases	New course created (see attached)
NET-135	Data Center Networking	New course created (see attached)
NOS-125	Linux/UNIX Scripting	New course created (see attached)
NOS-140	Legacy Operating Systems	New course created (see attached)
NOS-160	Mobile Operating Systems	New course created (see attached)
NOS-250	Enterprise Database Servers	New course created (see attached)
SEC-151	Intro to Protocol Analysis	New course created (see attached)

SEC-175	Perimeter Defense	New course created (see attached)
SEC-251	Advanced Protocol Analysis	New course created (see attached)
SEC-258	Security Compliance	New course created (see attached)

REVISED COURSES

Course #	Current Course Title	Action	Core Course	Action Description
NET-115	Telecom Fundamentals	Revise	None	Change the title to ***Telecom for IT Professional***s, change the description and hours.
NET-125	Networking Basics	Revise	Biomedical Equipment Technology (A50100), Healthcare Business Informatics (A25510), Telecommunications and Network Engineering Technology (A40400); *Following Curriculum Standards which have been archived with end term of Summer 2017)*: Computer Programming (A25130); Database Management (A25150); Computer Information Technology (A25260); Information Systems Security (A25270); Information Systems Security/Security Hardware (A2527B); Web Technologies (A25290); Networking Technology (A25340)	Change the title to ***Introduction to Networks*** and change the description.

CURRICULUM STANDARD

Effective Term
Fall 2016
*[2016*03]*

Curriculum Program Title	**Healthcare Business Informatics**	Program Code	**A25510**
Concentration	**(not applicable)**	CIP Code	***51.0709***

Curriculum Description

The Healthcare Business Informatics curriculum prepares individuals for employment as specialists in installation, data management, data archiving/retrieval, system design and support, and computer training for medical information systems.

Students learn about the field through multidisciplinary coursework including the study of terminology relating to informatics, systems analysis, networking technology, computer/network security, data warehousing, archiving and retrieval of information, and healthcare computer infrastructure support.

Graduates should qualify for employment as database/data warehouse analysts, technical support professionals, informatics technology professionals, systems analysts, networking and security technicians, and computer maintenance professionals in the healthcare field.

*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.

Healthcare Business Informatics A25510

		AAS	Diploma	Certificate
Minimum Major Hours Required		**49 SHC**	**30 SHC**	**12 SHC**
A. CORE *Courses required for the diploma are designated with **		**33-42 SHC**		
Required Courses:				
CTS 120 Hardware/Software Support	3 SHC			
*HBI 110 Issues and Trends in HBI	3 SHC			
*HBI 113 Survey of Med Insurance	3 SHC			
*HBI 250 Data Mgmt and Utilization	3 SHC			
Require Subject Areas:				
***Basic Computer Skills.* Select one:**				
CIS 110 Introduction to Computers	3 SHC			
CIS 111 Basic PC Literacy	2 SHC			
***Operating Systems.* Select one:**				
CTI 130 OS and Device Foundation	6 SHC			
NOS 110 Operating System Concepts	3 SHC			
***Information Security.* Select one:**				
CTI 120 Network & Sec Foundation	3 SHC			
SEC 110 Security Concepts	3 SHC			

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Approved by the State Board of Community Colleges on July 16, 2010; Correction 10/05/10; Editorial correction 11/23/10; Revised 12/5/11; Revised 12/14/11; Editorial Correction 02/22/12; CRC Revised - Electronic Only 02/29/12; SBCC Revised 08/16/12; CRC Revised—Electronic Only 05/29/13; Editorial Revision 04/22/14; CRC Revised—Electronic Only 05/29/14; Prefix Addition 08/01/15; CRC Revised 10/22/15.

Network Systems. Select one: NET 110 Networking Concepts 3 SHC NET 125 Introduction to Networks 3 SHC TNE 111 Campus Networks I 3 SHC **Database. Select one:** DBA 110 Database Concepts 3 SHC DBA 120 Database Programming I 3 SHC DBA 210 Database Administration 3 SHC **Medical Terminology. Select one set:** MED 120 Survey of Med Terminology 2 SHC *or* MED 121 Medical Terminology I 3 SHC *and* MED 122 Medical Terminology II 3 SHC *or* OST 141 Med Terms I-Med Office 3 SHC *and* OST 142 Med Terms II-Med Office 3 SHC **Medical Legal and Regulatory Issues. Select one:** MED 118 Medical Law and Ethics 2 SHC OST 149 Medical Legal Issues 3 SHC HMT 215 Legal Asp of Healthcare Admin 3 SHC **Business Management. Select one:** BUS 110 Introduction to Business 3 SHC ETR 210 Introduction to Entrepreneurship 3 SHC HMT 110 Intro to Healthcare Mgt 3 SHC LOG 110 Introduction to Logistics 3 SHC CTS 115 Info Sys Business Concepts 3 SHC			
B. CONCENTRATION *(Not applicable)*			
C. OTHER MAJOR HOURS *To be selected from the following prefixes/courses:* ACC, BIO, BUS, CCT, CIS, COM, CSC, CTI, CTS, DBA, ETR, GIS, GRO, HBI, HMT, ISC, LOG, MAT, MED, MKT, NET, NOS, OMT, OST, SEC, TNE, WBL, and WEB *Up to two semester hour credits may be selected from ACA.* *Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.*			

CURRICULUM STANDARD

Effective Term
Fall 1997
*[1997*03]*

Curriculum Program Title	**Dental Hygiene**	Program Code	**A45260**
Concentration	**(not applicable)**	CIP Code	***51.0602***

Curriculum Description

The Dental Hygiene curriculum provides individuals with the knowledge and skills to access, plan, implement, and evaluate dental hygiene care for the individual and the community.

Students will learn to prepare the operatory, take patient histories, note abnormalities, plan care, teach oral hygiene, clean teeth, take x-rays, apply preventive agents, complete necessary chart entries, and perform other procedures related to dental hygiene care.

Graduates of this program may be eligible to take national and state/regional examinations for licensure which are required to practice dental hygiene. Employment opportunities include dental offices, clinics, schools, public health agencies, industry, and professional education.

*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.

Dental Hygiene A45260

			AAS	Diploma	Certificate
Minimum Major Hours Required			**49 SHC**	**30 SHC**	**12 SHC**
A. CORE			**53-54 SHC**	**NR**	
Required Courses:					
BIO 175	General Microbiology	3 SHC			
DEN 110	Orofacial Anatomy	3 SHC			
DEN 111	Infection/Hazard Control	2 SHC			
DEN 112	Dental Radiography	3 SHC			
DEN 120	Dental Hygiene Preclinic Lecture	2 SHC			
DEN 121	Dental Hygiene Preclinic Laboratory	2 SHC			
DEN 123	Nutrition/Dental Health	2 SHC			
DEN 124	Periodontology	2 SHC			
DEN 130	Dental Hygiene Theory I	2 SHC			
DEN 131	Dental Hygiene Clinic I	3 SHC			
DEN 140	Dental Hygiene Theory II	1 SHC			
DEN 141	Dental Hygiene Clinic II	2 SHC			
DEN 220	Dental Hygiene Theory III	2 SHC			
DEN 221	Dental Hygiene Clinic III	4 SHC			
DEN 222	General and Oral Pathology	2 SHC			
DEN 223	Dental Pharmacology	2 SHC			
DEN 224	Materials and Procedures	2 SHC			
DEN 230	Dental Hygiene Theory IV	1 SHC			
DEN 231	Dental Hygiene Clinic IV	4 SHC			
DEN 232	Community Dental Health	3 SHC			
DEN 233	Professional Development	2 SHC			
Required Subject Areas:					
Anatomy & Physiology. Select one course:					
BIO 163	Basic Anatomy & Physiology	5 SHC			
BIO 165	Anatomy and Physiology I	4 SHC			
BIO 168	Anatomy and Physiology I	4 SHC			
B. CONCENTRATION *(Not applicable)*					

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Dental Hygiene A45260 (Continued)			
C. OTHER MAJOR HOURS *To be selected from the following prefixes:*			
BIO, CHM, CIS, CSC, DEN, HSC, and WBL *Up to two semester hour credits may be selected from ACA.* *Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.*			

Approved by the State Board of Community Colleges on November 13, 1996; SBCC Revised 05/17/02; SBCC Revised 09/21/07; SBCC Template Revised 10/17/08; Prefix Addition 08/01/15; CRC Revised—Electronic Only 10/22/15.

CURRICULUM STANDARD

Effective Term
Spring 2012
*[2012*01]*

Curriculum Program Title	**Surgical Technology**	Program Code	**A45740**
Concentration	**(not applicable)**	CIP Code	***51.0909***

Curriculum Description

The Surgical Technology curriculum prepares individuals to assist in the care of the surgical patient in the operating room and to function as a member of the surgical team.

Students will apply theoretical knowledge to the care of patients undergoing surgery and develop skills necessary to prepare supplies, equipment, and instruments; maintain aseptic conditions; prepare patients for surgery; and assist surgeons during operations.

Employment opportunities include labor/delivery/emergency departments, inpatient/outpatient surgery centers, dialysis units/facilities, physicians' offices, and central supply processing units.

Students of Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredited programs are required to take the national certification exam administered by the National Board on Certification in Surgical Technology and Surgical Assisting (NBSTSA) within a four week period prior to or after graduation.

*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.

Surgical Technology A45740

	AAS	Diploma	Certificate
Minimum Major Hours Required	**49 SHC**	**30 SHC**	**12 SHC**
A. CORE *Courses required for the diploma are designated with **	**37 SHC**	**33 SHC**	
Required Courses: * SUR 110 Introduction to Surgical Technology 3 SHC * SUR 111 Perioperative Patient Care 7 SHC * SUR 122 Surgical Procedures I 6 SHC * SUR 123 SUR Clinical Practice I 7 SHC * SUR 134 Surgical Procedures II 5 SHC * SUR 135 SUR Clinical Practice II 4 SHC * SUR 137 Professional Success Preparation 1 SHC SUR 210 Advanced SUR Clinical Practice 2 SHC SUR 211 Advanced Theoretical Concepts 2 SHC			
Required Subject Areas: None			
B. CONCENTRATION *(Not applicable)*			
C. OTHER MAJOR HOURS *To be selected from the following prefixes:* BIO, BUS, CIS, CSC, ECO, ENG, HSC, MED, PSY, SOC, STP, SUR, and WBL *Up to two semester hour credits may be selected from ACA.* *Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.*			

Approved by the State Board of Community Colleges on November 13, 1996; Revised 07/17/98; Corrected 03/13/01; Revised 11/21/01; SBCC Revised 05/17/02; CRC Revised – Electronic Only 03/21/07; SBCC Revised 09/21/07; SBCC Revised 08/15/08; SBCC Template Revision 10/17/08; Revised 10/22/08; CRC Revised-Electronic Only 3/16/10; SBCC Revised 10/21/11; Editorial Revision 01/17/14; Prefix Addition 08/01/15; CRC Revised—Electronic Only 10/22/15.

CURRICULUM STANDARD

Effective Term
Spring 2009
*[2009*01]*

Curriculum Program Title	**Computed Tomography & Magnetic Resonance Imaging Technology (Diploma)**	Program Code	**D45200**
Concentration	**(not applicable)**	CIP Code	***51.0999***

Curriculum Description

The Computed Tomography and Magnetic Resonance Imaging Technology curriculum prepares the individual to use specialized equipment to visualize cross-sectional anatomical structures and aid physicians in the demonstration of pathologies and disease processes. *Individuals entering this curriculum must be registered or registry- eligible radiologic technologist, radiation therapist, or nuclear medicine technologist.*

Course work prepares the technologist to provide patient care and perform studies utilizing imaging equipment, professional communication, and quality assurance in scheduled and emergency procedures through academic and clinical studies.

Graduates may be eligible to sit for the American Registry of Radiologic Technologist Advanced-Level testing in Computed Tomography and/or Magnetic Resonance Imaging examinations. They may find employment in facilities which perform these imaging procedures.

*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.

Computed Tomography & Magnetic Resonance Imaging Technology (Diploma) D45200

			AAS	Diploma	Certificate
Minimum Major Hours Required			**49 SHC**	**30 SHC**	**12 SHC**
A. CORE				**36 SHC**	
Required Courses:					
CAT 210	CT Physics and Equipment	3 SHC			
CAT 211	CT Procedures	4 SHC			
MRI 210	MRI Physics and Equipment	3 SHC			
MRI 211	MRI Procedures	4 SHC			
Required Subject Areas:					
CAT Clinical Practicum. Select 11 SHC:					
CAT 223	CT Clinical Practicum	3 SHC			
CAT 224	CT Clinical Practicum	4 SHC			
CAT 225	CT Clinical Practicum	5 SHC			
CAT 226	CT Clinical Practicum	6 SHC			
CAT 227	CT Clinical Practicum	7 SHC			
CAT 228	CT Clinical Practicum	8 SHC			
CAT 231	CT Clinical Practicum	11 SHC			
MRI Clinical Practicum. Select 11 SHC:					
MRI 223	MRI Clinical Practicum	3 SHC			
MRI 224	MRI Clinical Practicum	4 SHC			
MRI 225	MRI Clinical Practicum	5 SHC			
MRI 226	MRI Clinical Practicum	6 SHC			
MRI 227	MRI Clinical Practicum	7 SHC			
MRI 228	MRI Clinical Practicum	8 SHC			
MRI 231	MRI Clinical Practicum	11 SHC			
B. CONCENTRATION *(Not applicable)*					
C. OTHER MAJOR HOURS					
To be selected from the following prefixes:					
CAT, CIS, CSC, HSC, IMG, MRI, and WBL					
Up to two semester hour credits may be selected from ACA.					
Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.					

Approved by the State Board of Community Colleges on November 13, 1996; SBCC Revised 05/17/02; SBCC Revised 09/21/07; SBCC Revised 08/15/08; SBCC Template Revised 10/17/08; Editorial Revision 06/25/14; Editorial Revision 04/22/15; Editorial Revision 06/10/15; Prefix Addition 08/01/15; CRC Revised—Electronic Only 10/22/15.

Curriculum Standard for Engineering and Technology: Electrical Engineering Technology

Career Cluster: Science, Technology, Engineering, Mathematics**

Cluster Description: Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, and engineering) including laboratory and testing services, and research and development services.

Pathway: Engineering and Technology | **Effective Term:** Fall 2016 (2016*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Biomedical Equipment Technology	CIP Code: 15.0401	AAS/Diploma/Certificate	A50100
Computer Engineering Technology	CIP Code: 15.1201	AAS/Diploma/Certificate	A40160
Electrical Engineering Technology	CIP Code: 15.0399	AAS/Diploma/Certificate	A40180
Electronics Engineering Technology	CIP Code: 15.0303	AAS/Diploma/Certificate	A40200
Laser and Photonics Technology	CIP Code: 15.0304	AAS/Diploma/Certificate	A40280
Telecommunications and Network Engineering Technology	CIP Code: 15.0305	AAS/Diploma/Certificate	A40400

Pathway Description: These curriculums are designed to prepare students through the study and application of principles from mathematics, natural sciences, and technology and applied processes based on these subjects.

Course work includes mathematics, natural sciences, engineering sciences and technology.

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

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

Biomedical Equipment Technology: A course of study that prepares the students to use basic engineering principles and technical skills to install, operate, troubleshoot, and repair sophisticated devices and instrumentation used in the health care delivery system. Includes instruction in instrument calibration, design and installation testing, system safety and maintenance procedures, procurement and installation procedures, and report preparation. With an AAS degree and two years' experience, an individual should be able to become a certified Biomedical Equipment Technician.

Computer Engineering Technology: A course of study that prepares the students to use basic engineering principles and technical skills for installing, servicing, and maintaining computers, peripherals, networks, and microprocessor and computer controlled equipment. Includes instruction in mathematics, computer electronics and programming, prototype development and testing, systems installation and testing, solid state and microminiature circuitry, peripheral equipment, and report preparation. Graduates should qualify for employment opportunities in electronics technology, computer service, computer networks, server maintenance, programming, and other areas requiring knowledge of electronic and computer systems. Graduates may also qualify for certification in electronics, computers, or networks.

Electrical Engineering Technology: A course of study that prepares the students to apply basic engineering principles and technical skills in electrical maintenance and management or in the design, planning, construction, development, and installation of electrical systems, machines, and power generating equipment. Includes instruction in electrical circuitry, prototype development and testing, systems analysis and testing, systems maintenance, instrument calibration, and report preparation. Graduates may seek employment as technicians, engineering assistants, technical managers, or salespersons in electrical generation/distribution, industrial maintenance, electronic repair, or other fields requiring a broad-based knowledge of electrical and electronic concepts.

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

Approved by the State Board of Community Colleges on August 16, 2012; Editorial Revision 12/14/12; CRC Revised—Electronic Only 05/29/13; Editorial Revision 08/19/13; Editorial Revision 08/21/13; Editorial Revision 04/22/14; Editorial Revision 02/26/15; Prefix Addition 08/01/15; CRC Revised 10/22/15.

Electronics Engineering Technology: A course of study that prepares the students to apply basic engineering principles and technical skills to become technicians who design, build, install, test, troubleshoot, repair, and modify developmental and production electronic components, equipment, and systems such as industrial/computer controls, manufacturing systems, communication systems, and power electronic systems. Includes instruction in mathematics, basic electricity, solid-state fundamentals, digital concepts, and microprocessors or programmable logic controllers. Graduates should qualify for employment as electronics engineering technician, field service technician, instrumentation technician, maintenance technician, electronic tester, electronic systems integrator, bench technician, and production control technician.

Laser and Photonics Technology: A course of study that prepares the students to apply basic engineering principles and technical skills for specifying, operating, and maintaining laser-based systems. Includes instruction in mathematics, science, communications, electronics, and optics courses emphasizing laboratory learning experiences that develops the hands-on skills needed. Graduates of the curriculum qualify for current and emerging employment opportunities in fiber optic communications, materials processing, laser surgery, research, and a variety of related fields.

Telecommunications and Network Engineering Technology: A course of study that prepares the students to apply basic engineering principles and technical skills for positions in the telecommunication networking industry. Includes instruction in mathematics, basic electricity, solid-state fundamentals, digital concepts, microprocessors, telecommunications and network systems with an emphasis on analyzing and troubleshooting telecommunications and network systems. Graduates should qualify for employment as electronic engineering technician, field service technician, maintenance technician, network system technician, network specialist, network systems integrator, and network administrator.

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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.*

Engineering and Technology: Electrical Engineering Technology

General Education Academic Core				**AAS**	**Diploma**	**Certificate**
Minimum General Education Hours Required:				**15 SHC**	**6 SHC**	**0 SHC**
Courses listed below are recommended general education courses for this curriculum standard. Colleges may choose to include additional or alternative general education courses to meet local curriculum needs. **Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.*						
Communications:						
*COM	101	Workplace Communication	3 SHC	**6 SHC**	**3-6 SHC**	**Optional**
COM	110	Introduction to Communication	3 SHC			
COM	120	Intro Interpersonal Com	3 SHC			
COM	231	Public Speaking	3 SHC			
ENG	101	Applied Communications I	3 SHC			
*ENG	102	Applied Communications II	3 SHC			
ENG	110	Freshman Composition	3 SHC			
ENG	111	Expository Writing	3 SHC			
ENG	114	Professional Research & Reporting	3 SHC			
ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:						
*HUM	101	Values in the Workplace	2 SHC	**3 SHC**	**0-3 SHC**	**Optional**
HUM	110	Technology and Society	3 SHC			
HUM	115	Critical Thinking	3 SHC			
HUM	230	Leadership Development	3 SHC			
PHI	230	Introduction to Logic	3 SHC			
PHI	240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:						
ECO	151	Survey of Economics	3 SHC	**3 SHC**	**0-3 SHC**	**Optional**
ECO	251	Prin of Microeconomics	3 SHC			
GEO	110	Introduction to Geography	3 SHC			
GEO	111	World Regional Geography	3 SHC			
GEO	131	Physical Geography I	4 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 Process	3 SHC			
Natural Sciences/Mathematics:				**3 SHC**	**0-3 SHC**	**Optional**
MAT	120	Geometry and Trigonometry	3 SHC			
MAT	121	Algebra/Trigonometry I	3 SHC			
MAT	161	College Algebra	3 SHC			
MAT	171	Precalculus Algebra	3 SHC			
MAT	175	Precalculus	4 SHC			
MAT	223	Applied Calculus	3 SHC			
MAT	271	Calculus I	4 SHC			

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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 hour's 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 any prefix listed, with the exception of prefixes listed in the core.

Engineering and Technology: Electrical Engineering Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**24-28 SHC**		
Analog			
ELN 131 Analog Electronics I 4 SHC			
Circuits			
ELC 131 Circuit Analysis I 4 SHC			
OR			
ELC 138 DC Circuit Analysis 4 SHC			
AND			
ELC 139 AC Circuit Analysis 4 SHC			
Digital			
ELN 133 Digital Electronics 4 SHC			
B. Program Major(s). *For AAS Degree select one program major plus additional courses from the prefixes listed within the same program major for a minimum of (12) semester hours of credits.*			
I. Electrical Engineering Technology			
ELC 128 Intro to PLC 3 SHC			
OR			
ELN 260 Prog Logic Controllers 4 SHC			
ELC 135 Electrical Machines I 3 SHC			
ELC 231 Electric Power Systems 4 SHC			
Electronics Engineering Technology			
Choose at least 2 courses:			
ATR 214 Advanced PLCs 4 SHC			
ELC 128 Intro to PLC 3 SHC			
ELC 228 PLC Applications 4 SHC			
ELN 232 Intro to Microprocessors 4 SHC			
ELN 234 Communication Systems 4 SHC			
ELN 260 Prog Logic Controllers 4 SHC			

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Computer Engineering Technology

Choose one course:

CET 111	Computer Upgrade/Repair I	3 SHC
CTI 130	OS and Device Foundation	6 SHC
CTS 120	Hardware/Software Support	3 SHC

Choose at least one:

CSC 133	C Programming	3 SHC
CSC 134	C ++ Programming	3 SHC
CSC 139	Visual BASIC Prog	3 SHC
CSC 151	JAVA Programming	3 SHC
ELN 232	Intro to Microprocessors	4 SHC
NOS 110	Operating Systems Concepts	3 SHC

Telecommunications and Networking Engineering Technology

CET 130	Operating System Prin	3 SHC

Choose one pair of courses:

TNE 111	Campus Networks I	3 SHC
AND		
TNE 121	Campus Networks II	3 SHC
	OR	
NET 125	Introduction to Networks	3 SHC
AND		
NET 126	Routing Basics	3 SHC

Laser and Photonics Engineering Technology

LEO 211	Photonics Technology	7 SHC
LEO 212	Photonics Applications	4 SHC

Biomedical Equipment Technology

BMT 111	Intro to Biomed Field	2 SHC
BMT 212	BMET Instrumentation I	6 SHC

Choose at least one:

CET 111	Computer Upgrade/Repair I	3 SHC
NET 110	Networking Concepts	3 SHC
NET 125	Introduction to Networks	3 SHC
SEC 110	Security Concepts	3 SHC

C. Other Major Hours. ***To be selected from the following prefixes:***

AHR, ALT, ATR, BAT, BIO, BMT, BPR, CET, CHM, CIS, CSC, CTI, CTS, DBA, DEA, DFT, EGR, ELC, ELN, EPP, HYD, ISC, LEO, MAT, MEC, MNT, NET, NOS, OMT, PCI, PHY, SEC, SGD, SST, TNE, WBL, WEB, and WLD

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

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

III. Other Required Hours

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

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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**

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