

STATE BOARD OF COMMUNITY COLLEGES

NEW AND ARCHIVED CURRICULUM STANDARDS

Information Technology Alignment Project (ITAP) for 2014-2015

The State Board is asked to approve the following new curriculum standard:

Information Technology (A25xxx)

The State Board is asked to archive the following curriculum standards and allow colleges that currently have approval for the archived curriculum programs to receive approval for the new Information Technology (A25xxx) program:

Computer Information Technology (A25260)
Computer Programming (A25130)
Computer Technology Integration (A25500)
Database Management (A25150)
High Performance Computing (A25230)
Information Systems Security (A25270)
Information Systems Security/ Security Hardware (A2527B)
Networking Technology (A25340)
Web Technologies (A25290)

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**NEW, REVISED AND ARCHIVED CURRICULUM STANDARDS
Information Technology Alignment Project (ITAP) for 2014-2015**

As a result of the recommendations of the Information Technology Alignment Project (ITAP) participants, the State Board is requested to approve the following:

1. Archive the following curriculum standards and consolidate the content into one new career cluster model curriculum standard titled Information Technology (A25xxx) which contains specialty subject areas:

Computer Information Technology (A25260)
Computer Programming (A25130)
Computer Technology Integration (A25500)
Database Management (A25150)
Information Systems Security (A25270)
Information Systems Security/ Security Hardware (A2527B)
Networking Technology (A25340)
Web Technologies (A25290)

2. Allow colleges that currently have approval for any of the above proposed archived programs to receive approval for the new Information Technology (A25xxx) program.
3. Archive the following curriculum standard which none of the 58 colleges are currently approved to offer:

High Performance Computing (A25230)

Rationale

The participants of the Information Technology Alignment Project (ITAP) performed a comprehensive review of the Information Technology related programs and felt that the new and archived curriculum standard requests were needed in order to:

- Align the information technology programs with current industry and employer needs;
- Integrate current programs, representing different areas of Information Technology into one program with a common core;
- Incorporate program subject areas that can lead to potential industry certifications and stackable credentials;
- Strengthen pathways between high schools and colleges and between colleges and four-year institutions for students pursuing an Information Technology program;
- Align the proposed curriculum standard with the Information Technology Career Cluster[®] model;

Please note the proposed curriculum standard reflects the ITAP course requests which were approved by the Curriculum Review Committee (CRC) on May 27, 2015.

Information Technology Alignment Project - Voting Summary

Over seventy-five faculty participants, along with the NC Department of Public Instruction, senior institution and industry representatives collaborated to provide recommendations for the Information Technology program and courses. All fifty-eight colleges were invited to provide feedback and a formal vote on the ITAP participant recommendations. The following are the vote results for the proposed curriculum standard requests:

Colleges approved to offer IT related Programs:	58
Colleges in favor of recommendations:	51
Colleges not in favor of recommendations:	1*
Colleges not responding to vote:	6

**The opposing college has a concern that the proposed curriculum standard provides too much flexibility and does not provide enough required courses for each specialty area.*

Coordinator: Dr. Hilmi Lahoud

PROPOSED Curriculum Standard for Information Technology			
Career Cluster: Web and Digital Communications, Information Support and Services, Programming and Software Development, and Network Systems.			
Cluster Description: Building linkages in IT occupations framework: for entry level, technical, and professional careers related to the design, development, support, and management of hardware, software, multi-media, and systems integration services.			
Pathway: Information 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	
Information Technology	CIP Code: 11.0103	AAS/Diploma/Certificate	A25XXX
Pathway Description:			
<p>The Information Technology (IT) curriculum prepares graduates for employment in the technology sector as designers, testers, support technicians, system administrators, developers, or programmers who use computer software and/or hardware to design, process, implement and manage information systems in specialties such as database services, security, business intelligence, healthcare informatics and others depending on the technical path selected within this curriculum.</p> <p>Course work includes development of a student's ability to create, store, communicate, exchange and use information to solve technical issues related to information support and services, interactive media, network systems, programming and software development, information security and other emerging technologies based on the selected area of study.</p> <p>Graduates should qualify for employment in entry-level positions with businesses, educational systems, and governmental agencies which rely on computer systems to design and manage information. The program will incorporate the competencies of industry-recognized certification exams.</p>			
I. General Education Academic Core			
<p><i>Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1 D SBCC 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.</i></p>			
Information 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>Communication:</p> <p>COM 110 Introduction to Communication 3 SHC</p> <p>COM 120 Intro Interpersonal Com 3 SHC</p> <p>COM 231 Public Speaking U 3 SHC</p> <p>ENG 111 Writing and Inquiry U 3 SHC</p> <p>ENG 112 Writing/Research in the Disc U 3 SHC</p> <p>ENG 114 Prof Research & Reporting 3 SHC</p> <p>ENG 116 Technical Report Writing 3 SHC</p>	6 SHC	3-6 SHC	Optional

Attachment PROG 7

Humanities/Fine Arts:	ART 111 Art Appreciation U 3 SHC HUM 110 Technology and Society 3 SHC HUM 115 Critical Thinking 3 SHC HUM 230 Leadership Development 3 SHC MUS 110 Music Appreciation U 3 SHC PHI 240 Introduction to Ethics U 3 SHC	3 SHC	0-3 SHC	Optional
Social /Behavioral Sciences:	ECO 151 Survey of Economics 3 SHC ECO 251 Prin of Microeconomics U 3 SHC ECO 252 Prin of Macroeconomics U 3 SHC POL 120 American Government U 3 SHC PSY 118 Interpersonal Psychology 3 SHC PSY 150 General Psychology U 3 SHC SOC 210 Introduction to Sociology U 3 SHC	3 SHC	0-3 SHC	Optional
Natural Sciences/Mathematics:	MAT 110 Math Measurement and Literacy 3 SHC MAT 121 Algebra/Trigonometry I 3 SHC MAT 143 Quantitative Literacy U 3 SHC MAT 152 Statistical Methods I U 4 SHC MAT 171 Precalculus Algebra U 4 SHC	3-4 SHC	0-3 SHC	Optional
<p>U indicates a Universal General Education Transfer Component (UGETC) course included in the Comprehensive Articulation Agreement. UGETC courses are guaranteed to transfer to any of the sixteen University of North Carolina senior institutions as equivalent credit within defined distribution limits.</p>				

II. Major Hours. AAS, diploma, and certificate programs must include courses that offer specific job knowledge and skills. Work Based Learning (WBL) 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 of 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 of credit from required subjects and/or courses. The Program Major hours are in addition to the technical core hours.
- 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.

Information Technology	AAS	Diploma	Certificate
Minimum Major Hours Required:	49 SHC	30 SHC	12 SHC
<p>A. Technical 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>CTS 115 Info Sys Business Concepts 3 SHC CTI 110 Web, Pgm, & DB Foundation 3 SHC CTI 120 Network & Sec Foundation 3 SHC</p> <p><i>Select one:</i></p> <p>CET 111 Computer Upgrade/Repair I 3 SHC CIS 110 Introduction to Computers 3 SHC CIS 115 Intro to Prog and Logic 3 SHC CSC 120 Computing Fundamentals I 4 SHC CTI 115 Computer Systems Foundation 3 SHC CTI 130 Os and Device Foundation 6 SHC CTS 120 Hardware/Software Support 3 SHC NOS 110 Operating Systems Concepts 3 SHC OST 137 Office Software Applicat. 3 SHC</p> <p>B. Program Major: Information Technology Required Subject Areas (Select one subject area):</p> <p>Information Systems <i>12 SHC to be selected from:</i> CIS, CTI, CTS and/or NOS prefixes</p> <p>Computer Programming and Development <i>Select one:</i></p> <p>CSC 134 C++ Programming 3 SHC CSC 139 Visual BASIC Programming 3 SHC CSC 151 JAVA Programming 3 SHC CSC 153 C# Programming 3 SHC</p> <p><i>Select one:</i></p> <p>CSC 234 Advanced C++ Programing 3 SHC CSC 239 Advanced Visual BASIC Prog 3 SHC CSC 249 Data Structure & Algorithms 3 SHC CSC 251 Advanced JAVA Programing 3 SHC CSC 253 Advanced C# Programing 3 SHC</p> <p>Database Administration and Data Center Technologies <i>Select two:</i></p> <p>DBA 120 Database Programming I 3 SHC DBA 210 Database Administration 3 SHC CTI 140 Virtualization Concepts 3 SHC CTI 141 Cloud & Storage Concepts 3 SHC NOS 120 Linux/UNIX Single User 3 SHC</p> <p>Data Management <i>Select two:</i></p> <p>BUS 228 Business Statistics 3 SHC CTS 130 Spreadsheet 3 SHC DBA 110 Database Concepts 3 SHC DBA 115 Database Applications 3 SHC DBA 120 Database Programming I 3 SHC</p> <p>Data Support Services</p>	18-27 SHC	12 SHC	

Select two:

DBA 110	Database Concepts	3 SHC
DBA 115	Database Applications	3 SHC
DBA 120	Database Programming I	3 SHC
DBA 220	Oracle DB Programing II	3 SHC
DBA 221	SQL Server DB Prog II	3 SHC
DBA 240	Database Analysis/ Design	3 SHC

Digital Media Production*Select two:*

DME 110	Intro to Digital Media	3 SHC
DME 115	Graphic Design Tools	3 SHC
DME 120	Intro to Multimedia Appl	3 SHC
DME 130	Digital Animation I	3 SHC
WEB 210	Web Design	3 SHC

Game and Simulation Programming*Select one:*

CSC 134	C++ Programming	3 SHC
CSC 151	JAVA Programming	3 SHC
CSC 153	C# Programming	3 SHC
SGD 113	SGD Programming	3 SHC

Select one:

SGD 111	Introduction to SGD	3 SHC
SGD 112	SGD Design	3 SHC

Healthcare Informatics

HBI 110	Issues and Trends in HBI	3 SHC
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Select one:

DBA 110	Database Concepts	3 SHC
DBA 120	Database Programming I	3 SHC
DBA 210	Database Administration	3 SHC
HBI 113	Survey of Med Insurance	3 SHC

IT Business Support*Select two:*

CTS 130	Spreadsheet	3 SHC
CTS 240	Project Management	3 SHC
DBA 110	Database Concepts	3 SHC
DBA 240	Database Analysis/Design	3 SHC
WEB 151	Mobile Applications Dev I	3 SHC

Mobile Applications Developer*Select two:*

CTI 150	Mobile Computing Devices	3 SHC
WEB 125	WEB Mobile Design	3 SHC
WEB 141	Mobile Interface Design	3 SHC
WEB 151	Mobile Applications Dev I	3 SHC
WEB 251	Mobile Applications Dev II	3 SHC

Network Management*Select one:*

NET 110	Networking Concepts	3 SHC
NET 125	Networking Basics	3 SHC

Select one:

CTI 140	Virtualization Concepts	3 SHC
CTI 141	Cloud & Storage Concepts	3 SHC
NET 126	Routing Basics	3 SHC
NOS 120	Linux/UNIX Single User	3 SHC
NOS 230	Windows Administration I	3 SHC

Network Telecommunications*Select two:*

NET 125	Networking Basics	3 SHC
NET 130	Convergence Concepts	3 SHC
NET 241	Introduction to VOIP	3 SHC
TNE 111	Campus Networks I	3 SHC
TNE 250	Intro to Telecom Networks	3 SHC

Software and Web Development*Select two:*

CSC 139	Visual BASIC Programming	3 SHC
CSC 143	Object-Oriented Prog	3 SHC
CSC 151	JAVA Programming	3 SHC
CSC 153	C# Programming	3 SHC
DBA 120	Database Programming I	3 SHC
WEB 115	Web Markup and Scripting	3 SHC

Support and Services

CTS 155	Tech Support Functions	3 SHC
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Select one:

CET 211	Computer Upgrade/Repair I	3 SHC
CTS 135	Integrated Software Intro	4 SHC
CTS 220	Adv Hard/Software Support	3 SHC
CTS 250	User Support & Software Eval	3 SHC
CTS 255	Adv Tech Support Functions	3 SHC
CTS 272	Desktop Support: Apps	3 SHC

Systems Security

SEC 110	Security Concepts	3 SHC
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Select one:

CCT 110	Intro to Cyber Crime	3 SHC
NET 110	Networking Concepts	3 SHC
NET 125	Networking Basics	3 SHC
SEC 150	Secure Communications	3 SHC
SEC 160	Secure Administration I	3 SHC

Web Administration and Design*Select two:*

DBA 120	Database Programming I	3 SHC
NOS 120	Linux/UNIX Single User	3 SHC
NOS 230	Windows Administration I	3 SHC
WEB 115	Web Markup and Scripting	3 SHC
WEB 210	Web Design	3 SHC
WEB 250	Database Driven Websites	3 SHC

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

ACC, ART, BAS, BUS, CCT, CET, CIS, CJC, CSC, CTI, CTS, DBA, DEA, DES, DFT, DME, ECM, ECO, EGR, ELC, ELN, ETR, GIS, GRA, GRD, HBI, HIT, HMT, ISC, ITN, MAT, MIT, MKT, NET, NOS, OMT, OST, PCI, PHO, PMT, SEC, SGD, SGR, 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.

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

***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