

## 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:** Spring 2022 (2022\*01)

### Program Major 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
		A25590

### Pathway Description:

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.

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.

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.

### I. General Education Academic Core

*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1 D SBCC 400.10: 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.*

### Information Technology

Recommended General Education Academic Core	AAS	Diploma	Certificate																												
<b>Minimum General Education Hours Required:</b>	<b>15 SHC</b>	<b>6 SHC</b>	<b>0 SHC</b>																												
<p><i>Courses listed below are recommended general education courses for this curriculum standard. Colleges may choose to include additional or alternative general education courses to meet local curriculum needs.</i></p> <p><b>Communication:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">COM</td> <td style="width: 10%;">110</td> <td style="width: 40%;">Introduction to Communication</td> <td style="width: 10%;">3 SHC</td> </tr> <tr> <td>COM</td> <td>120</td> <td>Intro Interpersonal Com</td> <td>3 SHC</td> </tr> <tr> <td>COM</td> <td>231</td> <td>Public Speaking <b>U</b></td> <td>3 SHC</td> </tr> <tr> <td>ENG</td> <td>111</td> <td>Writing and Inquiry <b>U</b></td> <td>3 SHC</td> </tr> <tr> <td>ENG</td> <td>112</td> <td>Writing/Research in the Disc <b>U</b></td> <td>3 SHC</td> </tr> <tr> <td>ENG</td> <td>114</td> <td>Prof Research &amp; Reporting</td> <td>3 SHC</td> </tr> <tr> <td>ENG</td> <td>116</td> <td>Technical Report Writing</td> <td>3 SHC</td> </tr> </table>	COM	110	Introduction to Communication	3 SHC	COM	120	Intro Interpersonal Com	3 SHC	COM	231	Public Speaking <b>U</b>	3 SHC	ENG	111	Writing and Inquiry <b>U</b>	3 SHC	ENG	112	Writing/Research in the Disc <b>U</b>	3 SHC	ENG	114	Prof Research & Reporting	3 SHC	ENG	116	Technical Report Writing	3 SHC	<b>6 SHC</b>	<b>3-6 SHC</b>	<b>Optional</b>
COM	110	Introduction to Communication	3 SHC																												
COM	120	Intro Interpersonal Com	3 SHC																												
COM	231	Public Speaking <b>U</b>	3 SHC																												
ENG	111	Writing and Inquiry <b>U</b>	3 SHC																												
ENG	112	Writing/Research in the Disc <b>U</b>	3 SHC																												
ENG	114	Prof Research & Reporting	3 SHC																												
ENG	116	Technical Report Writing	3 SHC																												

\*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 September 18, 2015. Editorial revision September 21, 2015; Editorial Revision 09/25/15; CRC Revised 10/22/15; CRC Revised 05/26/16; CRC Revised—Electronic Only 05/25/17; Prefix addition 09/18/17; CCRC Revised—Electronic Only 05/23/19; CCRC Revised—Electronic Only (RISE Initiative) 10/24/19; Revised 02/13/20; CCRC Electronic Only 2/25/21; CCRC Revised 02/25/21; Prefix Addition 5/24/21; CCRC Revised 5/27/21; Prefix Addition 3/17/22; CCRC Revised 05/24/2023.

<b>Humanities/Fine Arts:</b>				<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
ART	111	Art Appreciation <b>U</b>	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 <b>U</b>	3 SHC			
PHI	240	Introduction to Ethics <b>U</b>	3 SHC			
<b>Social/Behavioral Sciences:</b>				<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
ECO	151	Survey of Economics	3 SHC			
ECO	251	Prin of Microeconomics <b>U</b>	3 SHC			
ECO	252	Prin of Macroeconomics <b>U</b>	3 SHC			
POL	120	American Government <b>U</b>	3 SHC			
PSY	118	Interpersonal Psychology	3 SHC			
PSY	150	General Psychology <b>U</b>	3 SHC			
SOC	210	Introduction to Sociology <b>U</b>	3 SHC			
<b>Natural Sciences/Mathematics:</b>				<b>3-4 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
MAT	110	Math Measurement and Literacy	3 SHC			
MAT	121	Algebra/Trigonometry I	3 SHC			
MAT	143	Quantitative Literacy <b>U</b>	3 SHC			
MAT	152	Statistical Methods I <b>U</b>	4 SHC			
MAT	171	Precalculus Algebra <b>U</b>	4 SHC			
<p><b>U</b> 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.
- C. Other Major Hours.** Other Major Hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

<b>Information Technology</b>	<b>AAS</b>	<b>Diploma</b>	<b>Certificate</b>
<b>Minimum Major Hours Required:</b>	<b>49 SHC</b>	<b>30 SHC</b>	<b>12 SHC</b>
<b>A. Technical Core:</b> <i>A diploma offered under this AAS degree requires a minimum of 12 SHC extracted from the required subject/course core of the AAS degree</i>	<b>18-27 SHC</b>	<b>12 SHC</b>	
CTS 115 Info Sys Business Concepts 3 SHC CTI 110 Web, Pgm, & DB Foundation 3 SHC CTI 120 Network & Sec Foundation 3 SHC  <i>Select one:</i> 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 Applications I 3 SHC WEB 110 Internet/WEB Fundamentals 3 SHC			
<b>Information Technology            Required Subject Areas (Select one subject area):</b>			
<b>Information Systems</b> <i>12 SHC to be selected from:</i> CIS, CTI, CTS, DME, NOS and/or WEB prefixes			
<b>Computer Programming and Development</b> <i>Select one:</i> 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  <i>Select one:</i> 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			
<b>Database Administration and Data Center Technologies</b> <i>Select two:</i> BAS 120 Intro to Analytics 3 SHC 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			
<b>Data Management</b> <i>Select two:</i> 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			

<b>Data Support Services</b>						
<i>Select two:</i>						
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			
<b>Digital Media Production</b>						
<i>Select two:</i>						
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			
<b>Game and Simulation Programming</b>						
<i>Select one:</i>						
CSC	134	C++ Programming	3 SHC			
CSC	151	JAVA Programming	3 SHC			
CSC	153	C# Programming	3 SHC			
SGD	113	SGD Programming I	3 SHC			
<i>Select one:</i>						
SGD	111	Introduction to SGD	3 SHC			
SGD	112	SGD Design I	3 SHC			
<b>Healthcare Informatics</b>						
HBI	110	Issues and Trends in HBI	3 SHC			
<i>Select one:</i>						
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			
<b>IT Business Support</b>						
<i>Select two:</i>						
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			
<b>Mobile Applications Developer</b>						
<i>Select two:</i>						
CTI	150	Mobile Computing Devices	3 SHC			
WEB	125	Responsive Web Frameworks	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			
<b>Network Management</b>						
<i>Select one:</i>						
NET	110	Networking Concepts	3 SHC			
NET	125	Introduction to Networks	3 SHC			
<i>Select one:</i>						
CTI	140	Virtualization Concepts	3 SHC			
CTI	141	Cloud & Storage Concepts	3 SHC			
NET	126	Switching and Routing	3 SHC			
NOS	120	Linux/UNIX Single User	3 SHC			
NOS	230	Windows Administration I	3 SHC			

<b>Network Telecommunications</b>						
<i>Select two:</i>						
NET	125	Introduction to Networks	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			
<b>Software and Web Development</b>						
<i>Select two:</i>						
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			
<b>Support and Services</b>						
CTS	155	Tech Support Functions	3 SHC			
<i>Select one:</i>						
CET	211	Computer Upgrade/Repair II	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			
<b>Systems Security</b>						
SEC	110	Security Concepts	3 SHC			
<i>Select one:</i>						
CCT	110	Intro to Cyber Crime	3 SHC			
NET	110	Networking Concepts	3 SHC			
NET	125	Introduction to Networks	3 SHC			
SEC	150	Secure Communications	3 SHC			
SEC	160	Security Administration I	3 SHC			
<b>Web Administration and Design</b>						
<i>Select two:</i>						
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, ATR, BAS, BUS, CCT, CET, CIS, CJC, CSC, CTI, CTS, DBA, DEA, DES, DFT, DME, ECM, ECO, EDU, EGR, ELC, ELN, ETR, GIS, GRA, GRD, HBI, HIT, HMT, ISC, ITN, MAT, MCO, MED, MIT, MKT, NET, NOS, OMT, OST, PCI, PHO, PMT, SEC, SGD, SGR, TNE, WBL, and WEB.

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

*Three semester hour credits may be selected from PTE.*

*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](http://www.nc-net.info/NC_career_clusters_guide.php) or <http://www.careertech.org/>

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

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