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)

**Contact Person:**
Jennifer Frazelle, Director
Academic Programs
919.807.7120
frazellej@nccommunitycolleges.edu
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


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)

<table>
<thead>
<tr>
<th>Program Major / Classification of Instruction Programs (CIP) Code</th>
<th>Credential Level(s) Offered</th>
<th>Program Major Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Technology</td>
<td>AAS/Diploma/Certificate</td>
<td>A25XXX</td>
</tr>
</tbody>
</table>

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 400.97 (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. |

Information Technology

<table>
<thead>
<tr>
<th>Recommended General Education Academic Core</th>
<th>AAS</th>
<th>Diploma</th>
<th>Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum General Education Hours Required:</td>
<td>15 SHC</td>
<td>6 SHC</td>
<td>0 SHC</td>
</tr>
</tbody>
</table>

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.

Communication:

| COM 110 Introduction to Communication | 3 SHC |
| COM 120 Intro Interpersonal Com       | 3 SHC |
| COM 231 Public Speaking U             | 3 SHC |
| ENG 111 Writing and Inquiry U         | 3 SHC |
| ENG 112 Writing/Research in the Disc U| 3 SHC |
| ENG 114 Prof Research & Reporting     | 3 SHC |
### 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

### 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

### 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

*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.

---

**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

### Minimum Major Hours Required:

<table>
<thead>
<tr>
<th>Total</th>
<th>AAS</th>
<th>Diploma</th>
<th>Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 SHC</td>
<td>30 SHC</td>
<td>12 SHC</td>
<td></td>
</tr>
</tbody>
</table>

#### A. Technical Core:

A diploma offered under this AAS degree requires a minimum of 12 SHC extracted from the required subject/course core of the AAS degree.

- CTS 115 Info Sys Business Concepts 3 SHC
- CTI 110 Web, Pgm, & DB Foundation 3 SHC
- CTI 120 Network & Sec Foundation 3 SHC

Select one:

- 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

#### B. Program Major: Information Technology

**Required Subject Areas (Select one subject area):**

- **Information Systems**
  12 SHC to be selected from:
  - CIS, CTI, CTS and/or NOS prefixes

- **Computer Programming and Development**
  Select one:
  - 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

  Select one:
  - CSC 234 Advanced C++ Programming 3 SHC
  - CSC 239 Advanced Visual BASIC Prog 3 SHC
  - CSC 249 Data Structure & Algorithms 3 SHC
  - CSC 251 Advanced JAVA Programming 3 SHC
  - CSC 253 Advanced C# Programming 3 SHC

- **Database Administration and Data Center Technologies**
  Select two:
  - 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

- **Data Management**
  Select two:
  - 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
### Data Support Services
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 Programing  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
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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>SHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOS 230</td>
<td>Windows Administration I</td>
<td>3</td>
</tr>
</tbody>
</table>

**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

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

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:

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

SBCC
08/21/2015