NORTH CAROLINA COMMUNITY COLLEGE SYSTEM
Dr. R. Scott Ralls, President

August 20, 2012

MEMORANDUM

TO: Presidents
Chief Academic Officers

FROM: Sharon E. Morrissey
Senior Vice President and Chief Academic Officer

SUBJECT: State Board Action on August 16, 2012
Code Green Super CIP
Revised Program Application Process/Accountability Report

On August 16, 2012, the State Board of Community Colleges approved thirty-two curriculum standards, accompanied by a new curriculum standard format, which represents the work of the Code Green Super Curriculum Improvement Project (CIP). *Recall that on May 29, 2012, the Curriculum Review Committee approved action to approximately 360 courses as a result of course requests from the Code Green Super CIP (CC12-017).* Colleges may begin utilizing the revised standards as early as fall of 2013, but must have implemented the revisions by no later than one year after the effective term (fall of 2014).

The curriculum standards, developed by the Code Green Super CIP, are aligned with Career Cluster titles which assist in identification of secondary and postsecondary pathways. The attached crosswalk is provided to assist you in locating the placement of current program titles. A complete set of the approved curriculum standards is also attached.

Colleges currently approved to offer Automotive Systems Technology (A60160) have been provided with *optional* State Board approval for the following new programs upon completion of the attached form:

Alternative Transportation Technology (D60420)
Automotive Light-Duty Diesel Technology (D60430)

In order to secure the optional approval, please complete the attached form. We encourage colleges to submit the completed form to us as quickly as possible. ***Please note that the form must be completed and submitted prior to June 1, 2013, in order to obtain the optional approval. Requests for the Alternative Transportation Technology and/or Automotive Light-Duty Diesel Technology program(s) received after June 1, 2013 will need to be accompanied by a full program application.***

MAILING ADDRESS: 5016 MAIL SERVICE CENTER ~ RALEIGH, NC 27699-5016
Street Address: 200 West Jones ~ Raleigh, NC 27603 ~ 919-807-7100 ~ Fax 919-807-7173

In additional action, the State Board of Community Colleges approved the revision of the Program Application process. The revised process allows colleges to tie program planning to economic development initiatives; emphasizes local board of trustee certification of the program feasibility plan; simplifies the system-wide impact assessment process and requires colleges to complete an *Accountability Report* which will be sent to the State Board within three years of program implementation. **Program applications received on/after October 1, 2012, are required to utilize the requirements of the revised process.** The new program application process (defined in Sections 3, 3A and 3B of the *Curriculum Procedures Reference Manual*) is attached.

Further State Board action included the approval of the requested revisions to the following attached curriculum standards:

Healthcare Business Informatics (A25510)
Medical Dosimetry (Diploma) (D45450)
Positron Emission Tomography (Diploma) (D45820)

Please be aware that you must implement the Code Green Super CIP revised standards and the traditional revised curriculum standards no later than one year after the effective term. This process includes updating your college's electronic programs of study and receiving approval from the System Office prior to implementation of the revised program. *(Programs of Study filed for Fall 2013 and beyond should only be filed in Colleague. Please do not enter these into IIPS. Colleges will receive additional information about Colleague training in the immediate future.)* You may view all curriculum standards and courses by visiting the Programs website at:

http://www.nccommunitycolleges.edu/Programs/index.html

If you have any questions concerning the State Board action items, please contact Jennifer Frazelle at (919) 807-7120 or frazellej@nccommunitycolleges.edu.

SEM/JF/gr
Attachments
c: Dr. Van Wilson
Ms. Jennifer Haygood
Ms. Elizabeth Self
Ms. Jennifer Frazelle
Program Coordinators

CC12-024
Email

Alternative Transportation Technology (D60420)
Automotive Light-Duty Diesel Technology (D60430)

Request for Approval

Our college is currently approved for the Automotive Systems Technology (A60160) program. We would like to obtain program approval for one or both of the following programs:

☐ Alternative Transportation Technology (D60420)
With an effective term of *(earliest effective term is Fall 2013)*:_____

☐ Automotive Light-Duty Diesel Technology (D60430)
With an effective term of *(earliest effective term is Fall 2013)*:_____

_____
College Name

_____ _____
Signature, President of College *Date*

Please submit the completed/signed form to: Jennifer Frazelle, Director
Academic Programs
5016 Mail Service Center
Raleigh, NC 27699-5016

Forms may be faxed to: 919-807-7173

Your college will receive a letter of program approval within two weeks of receipt of this completed/signed form. Your college will then be directed to file an electronic program of study for review. The electronic POS must be submitted and approved prior to implementation of the program(s).

Requests for the Alternative Transportation Technology and/or Automotive Light-Duty Diesel Technology program(s) received after June 1, 2013, will need to be accompanied by a full program application.

Code Green Super Curriculum Improvement Project (CIP)
New/Revised/Archived Program Major Titles
Approved by State Board of Community Colleges on 08/16/2012

Current Program Major Code	Current Program Major Title	Program major is now located on this New Curriculum Standard Title	Program Major is Classified under this Career Cluster
AGRICULTURAL AND NATURAL RESOURCES TECHNOLOGY			
A15100	Agribusiness Technology *(Revised)*	Agribusiness: Agricultural Science Technology	Agriculture, Food and Natural Resources
A15280	Applied Animal Science Technology *(Revised)*	Animal Systems: Applied Animal Science Technology	Agriculture, Food and Natural Resources
A1528B	Applied Animal Science Technology/Swine Management *(Archived 08/16/12 - Converted to Swine Management Technology A15150). Colleges currently approved for A1528B will receive approval for A15150.*	Archived - Not Applicable	Archived - Not Applicable
A15120	Aquaculture Technology *(Revised)*	Animal Systems: Aquaculture Technology	Agriculture, Food and Natural Resources
A15170	Equine Business Technology *(New)*	Animal Systems: Equine Science Technology	Agriculture, Food and Natural Resources
A15140	Equine Technology *(Archived 08/16/12 - Split into Equine Business Technology A15170 and Equine Training Technology A15190). Colleges approved for A15140 will receive approval for A15170 and A15190.*	Archived - Not Applicable	Archived - Not Applicable
A15190	Equine Training Technology *(New)*	Animal Systems: Equine Science Technology	Agriculture, Food and Natural Resources
A15160	Fish and Wildlife Management Technology *(Revised)*	Natural Resources Technology	Agriculture, Food and Natural Resources
A15200	Forestry Management Technology *(Revised)*	Natural Resources Technology	Agriculture, Food and Natural Resources
A15230	Golf Course Management Technology *(New)*	Plant Systems: Horticultural Science Technology	Agriculture, Food and Natural Resources
A15240	Horticulture Technology *(Revised)*	Plant Systems: Horticultural Science Technology	Agriculture, Food and Natural Resources
A1524A	Horticulture Technology/Management *(Archived 08/16/12)*	Archived - Not Applicable	Archived - Not Applicable
A15260	Landscape Gardening *(Revised)*	Plant Systems: Horticultural Science Technology	Agriculture, Food and Natural Resources
A15310	Marine Science *(Revised)*	Natural Resource Systems: Marine Technology	Agriculture, Food and Natural Resources
A15320	Marine Technology *(Revised)*	Natural Resource Systems: Marine Technology	Agriculture, Food and Natural Resources

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A15360	Parks and Natural Resource Management *(Archived 08/16/12)*	Archived - Not Applicable	Archived - Not Applicable
A15130	Poultry Management Technology *(New)*	Animal Systems: Applied Animal Science Technology	Agriculture, Food and Natural Resources
A15410	Sustainable Agriculture *(Revised)*	Agribusiness: Agricultural Science Technology	Agriculture, Food and Natural Resources
A15150	Swine Management Technology *(New)*	Animal Systems: Applied Animal Science Technology	Agriculture, Food and Natural Resources
A15420	Turfgrass Management Technology *(Revised)*	Plant Systems: Horticultural Science Technology	Agriculture, Food and Natural Resources
A1542A	Turfgrass Management Technology/Golf Course Management *(Archived 08/16/12 - Converted to Golf Course Management Technology A15230). Colleges currently approved for A1542A will receive approval for A15230.*	Archived - Not Applicable	Archived - Not Applicable
A15430	Viticulture and Enology Technology	Plant Systems: Viticulture and Enology Technology	Agriculture, Food and Natural Resources
BIOLOGICAL AND CHEMICAL TECHNOLOGIES			
A20110	Agricultural Biotechnology *(Revised)*	Science and Math: Biotechnology	Science, Technology, Engineering, and Math
A20260	Aquarium Science Technology *(New)*	Science and Math: Zoo and Aquarium Science Technology	Science, Technology, Engineering, and Math
A20100	Biotechnology *(Revised)*	Science and Math: Biotechnology	Science, Technology, Engineering, and Math
A20150	Environmental Biotechnology *(New)*	Science and Math: Biotechnology	Science, Technology, Engineering, and Math
A20230	Environmental Management Technology *(New)*	Science and Math: Environmental Science Technology	Science, Technology, Engineering, and Math
A20140	Environmental Science Technology *(Revised)*	Science and Math: Environmental Science Technology	Science, Technology, Engineering, and Math
A2014A	Environmental Science Technology/Water Resources Management *(Archived 08/16/12 - Converted to Environmental Management Technology A20230). Colleges currently approved for A2014A will receive approval for A20230.*	Archived - Not Applicable	Archived - Not Applicable
A2014B	Environmental Science Technology/Environmental Management	Archived - Not Applicable	Archived - Not Applicable

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	(Archived 08/16/12 - Converted to Environmental Management Technology A20230). Colleges currently approved for A2014B will receive approval for A20230.		
A2014C	Environmental Science Technology/Invasive Species Management *(Archived 08/16/12 - Converted to Invasive Species Management Technology A20240). Colleges currently approved for A2014C will receive approval for A20240.*	Archived - Not Applicable	Archived - Not Applicable
A20240	Invasive Species Management Technology *(New)*	Science and Math: Environmental Science Technology	Science, Technology, Engineering, and Math
A20160	Laboratory Technology *(Revised)*	Science and Math: Biotechnology	Science, Technology, Engineering, and Math
A20170	Marine Biotechnology *(New)*	Science and Math: Biotechnology	Science, Technology, Engineering, and Math
A20220	Zoo and Aquarium Science Technology *(Archived 08/16/12 - Split into Zoological Science Technology A20250 and Aquarium Science Technology A20260. Colleges currently approved for A20220 will receive approval for A20250 and A20260.*	Archived - Not Applicable	Archived - Not Applicable
A20250	Zoological Science Technology *(New)*	Science and Math: Zoo and Aquarium Science Technology	Science, Technology, Engineering, and Math
CONSTRUCTION TECHNOLOGIES			
A35100	Air Conditioning, Heating and Refrigeration Technology *(Revised)*	Air Conditioning, Heating, and Refrigeration Technology	Architecture and Construction
D35120	Boat Building *(Revised)*	Construction: Boat Building	Architecture and Construction
A35140	Building Construction Technology *(Revised)*	Construction: Architecture & Construction Technology	Architecture and Construction
D35180	Carpentry *(Revised)*	Construction: Architecture & Construction Technology	Architecture and Construction
A35190	Construction Management Technology *(Revised)*	Construction: Architecture & Construction Technology	Architecture and Construction
A35220	Electrical/Electronics Technology *(Archived 8/16/12 - Converted to Electrical Systems Technology A35130). Colleges currently*	Archived - Not Applicable	Archived - Not Applicable

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Current Program Major Code	Current Program Major Title	Program major is now located on this New Curriculum Standard Title	Program Major is Classified under this Career Cluster
	approved for A35220 will receive approval for A35130.		
A35130 ~~A35220~~	Electrical Systems Technology *(New)* ~~Electrical/Electronics Technology~~	Electrical Systems Technology	Architecture and Construction
A35110	Historic Preservation Technology *(Revised)*	Construction: Historic Preservation Technology	Architecture and Construction
D35280	Masonry *(Revised)*	Construction: Architecture & Construction Technology	Architecture and Construction
D35300	Plumbing *(Revised)*	Construction: Architecture & Construction Technology	Architecture and Construction
ENGINEERING TECHNOLOGIES			
A40130	Applied Engineering Technology *(Revised)*	Engineering and Technology: Applied, Automation, Mechatronics Engineering Technology	Science, Technology, Engineering, and Mathematics
A40100	Architectural Technology *(Revised)*	Construction: Architecture & Construction Technology	Architecture and Construction
A40120	Automation Engineering Technology *(Revised)*	Engineering and Technology: Applied, Automation, Mechatronics Engineering Technology	Science, Technology, Engineering, and Mathematics
A40140	Civil Engineering Technology *(Revised)*	Engineering and Technology: Civil Engineering and Geomatics Technologies	Science, Technology, Engineering, and Mathematics
A40160	Computer Engineering Technology *(Revised)*	Engineering and Technology: Electrical Engineering Technology	Science, Technology, Engineering, and Mathematics
A40180	Electrical Engineering Technology *(Revised)*	Engineering and Technology: Electrical Engineering Technology	Science, Technology, Engineering, and Mathematics
A40200	Electronics Engineering Technology *(Revised)*	Engineering and Technology: Electrical Engineering Technology	Science, Technology, Engineering, and Mathematics
A40150	Environmental Engineering Technology *(New)*	Engineering and Technology: Civil Engineering and Geomatics Technologies	Science, Technology, Engineering, and Mathematics
A40420 ~~A40380~~	Geomatics Technology *(New)* ~~Surveying Technology~~	Engineering and Technology: Civil Engineering and Geomatics Technologies	Science, Technology, Engineering, and Mathematics
A40110	Geospatial Mapping Technology *(New)*	Engineering and Technology: Civil Engineering and Geomatics Technologies	Science, Technology, Engineering, and Mathematics
A40220	Geospatial Technology *(Revised)*	Engineering and Technology: Geospatial	Science, Technology, Engineering, and

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		Technology	Mathematics
A40240	Industrial Engineering Technology *(Revised)*	Manufacturing Production and Process Development: Manufacturing and Industrial Engineering Technology	Manufacturing
A40260	Landscape Architecture Technology *(Revised)*	Construction: Landscape Architecture Technology	Architecture and Construction
A40280	Laser and Photonics Technology *(Revised)*	Engineering and Technology: Electrical Engineering Technology	Science, Technology, Engineering, and Mathematics
A40290	Low Impact Development *(Revised)*	Construction: Low Impact Development	Architecture and Construction
A40320	Mechanical Engineering Technology *(Revised)*	Engineering and Technology: Mechanical Engineering Technology	Science, Technology, Engineering, and Mathematics
A40350	Mechatronics Engineering Technology *(Revised)*	Engineering and Technology: Applied, Automation, Mechatronics Engineering Technology	Science, Technology, Engineering, and Mathematics
A40380	Surveying Technology *(Archived 08/16/12 - Converted to Geomatics Technology A40420. Colleges currently approved for A40380 will receive approval for A40420.*	Archived - Not Applicable	Archived - Not Applicable
A40370	Sustainability Technologies *(Revised)*	Sustainability Technologies	Science, Technology, Engineering, and Mathematics
A40400	Telecommunications and Network Engineering Technology *(Revised)*	Engineering and Technology: Electrical Engineering Technology	Science, Technology, Engineering, and Mathematics
INDUSTRIAL TECHNOLOGIES			
A50100	Biomedical Equipment Technology *(Revised)*	Engineering and Technology: Electrical Engineering Technology	Science, Technology, Engineering, and Mathematics
A50150	Computer-Aided Drafting Technology *(Revised)*	Engineering and Technology: Drafting Technology	Science, Technology, Engineering, and Mathematics
A50240	Industrial Systems Technology *(Revised)*	Industrial Systems Technology	Manufacturing
A50260	Industrial Management Technology *(Revised)*	Manufacturing Production and Process Development: Manufacturing and Industrial Engineering Technology	Manufacturing
A50320	Manufacturing Technology *(Revised)*	Manufacturing Production and Process Development: Manufacturing and Industrial Engineering Technology	Manufacturing
A5032D	Manufacturing Technology/Composites *(Archived 08/16/12)*	Archived - Not Applicable	Archived - Not Applicable

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New/Revised/Archived Program Major Titles
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Current Program Major Code	Current Program Major Title	Program major is now located on this New Curriculum Standard Title	Program Major is Classified under this Career Cluster
A5032C	Manufacturing Technology/Integrated Operations *(Archived 08/16/12)*	Archived - Not Applicable	Archived - Not Applicable
A5032A	Manufacturing Technology/Plastics *(Archived 08/16/12)*	Archived - Not Applicable	Archived - Not Applicable
A50340	Mechanical Drafting Technology *(Revised)*	Engineering and Technology: Drafting Technology	Science, Technology, Engineering, and Mathematics
A50350	Nondestructive Examination Technology *(Revised)*	Quality Assurance: Nondestructive Examination Technology	Manufacturing
A50550	Quality Assurance and Continuous Improvement *(New)*	Manufacturing Production and Process Development: Manufacturing and Industrial Engineering Technology	Manufacturing
A50420	Welding Technology *(Revised)*	Production: Welding Technology	Manufacturing
PUBLIC SERVICE TECHNOLOGIES			
A55100	Animal Care and Management Technology *(Revised)*	Animal Systems: Animal Care Management Technology	Agriculture, Food and Natural Resources
A55330	Outdoor Leadership *(Revised)*	Education/Training: Outdoor Leadership	Education & Training
TRANSPORT SYSTEMS TECHNOLOGIES			
A60410	Agricultural Systems Technology *(New)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
D60420	Alternative Transportation Technology *(New)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
A60190	Automotive Customizing Technology *(Revised)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
D60430	Automotive Light-Duty Diesel Technology *(New)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
D60140	Automotive Restoration Technology *(Revised)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
A60160	Automotive Systems Technology *(Revised)* (Colleges currently approved for Automotive Systems Technology A60160 may receive *optional* approval for Alternative Transportation Technology D60420 and/or Automotive Light-Duty Diesel Technology D60430. See CC12-024 for instructions/form.)	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics

Code Green Super Curriculum Improvement Project (CIP)
New/Revised/Archived Program Major Titles
Approved by State Board of Community Colleges on 08/16/2012

Current Program Major Code	Current Program Major Title	Program major is now located on this New Curriculum Standard Title	Program Major is Classified under this Career Cluster
A60130	Collision Repair and Refinishing Technology *(Revised)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
A60450	Construction Equipment Systems Technology *(New)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
A60460	Diesel and Heavy Equipment Technology *(New)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
A60240	Heavy Equipment and Transport Technology *(Archived 08/16/12 - Converted to Diesel and Heavy Equipment Technology A60460). Colleges currently approved for A60240 will receive approval for A60460.*	Archived - Not Applicable	Archived - Not Applicable
A6024A	Heavy Equipment and Transport Technology/Agricultural Systems *(Archived 08/16/12 - Converted to Agriculture Systems Technology A60410). Colleges currently approved for A6024A will receive approval for A60410.*	Archived - Not Applicable	Archived - Not Applicable
A6024B	Heavy Equipment and Transport Technology/Construction Equipment Systems *(Archived 08/16/12 - Converted to Construction Equipment Systems Technology A60450). Colleges currently approved for A6024B will receive approval forA60450.*	Archived - Not Applicable	Archived - Not Applicable
A6024C	Heavy Equipment and Transport Technology/Marine Systems *(Archived 08/16/12 - Converted to Diesel and Heavy Equipment Technology A60460). Colleges currently approved for A6024C will receive approval for A60460.*	Archived - Not Applicable	Archived - Not Applicable
A60260 ~~D60260~~	Motorcycle Mechanics *(Program was converted from a diploma to an Associate in Applied Science program.) Colleges currently approved for D60260 will receive approval for A60260.* ~~Motorcycle Mechanics (Diploma)~~	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics
D60310	Recreational Vehicle Maintenance and Repair Technology *(Revised)*	Mobile Equipment Maintenance and Repair	Transportation, Distribution and Logistics

NC Community Colleges

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Curriculum Procedures Reference Manual
Section 3

Curriculum Program Application for Existing Program Titles Procedures and Accountability Report

(Associate in Applied Science, Diploma, and Certificate Curriculum Programs)

Implementation October 1, 2012

Originally Approved by the State Board of Community Colleges on January 21, 2000. Revised on April 17, 2002; March 7, 2005; August 26, 2005; November 8, 2006; April 18, 2008; September 19, 2008; January 21, 2011 and August 16, 2012.

North Carolina Community College System
Curriculum Program Application Procedures and Accountability Report for Existing Program Titles

Please note that colleges may utilize the Special Curriculum Program Application process when applying for a concentration program if the applying college already has approval for the parent program. Please see Section 3A of the Curriculum Procedures Manual for information concerning the Special Curriculum Program Application process.

The State Board of Community Colleges has established rules to guide the approval of programs:

> *(1) The approval of a college or of a group of colleges in a collaborative arrangement to award the associate degree, diploma, or certificate shall be by individual curriculum program title. Approval by the State Board shall be granted when the college has demonstrated an established need and has provided evidence to the State Board of sufficient instructional faculty, facilities, equipment, and materials required to meet the needs of the communities served without supplanting or duplicating existing programs.*
>
> *(2) The application shall be signed by the college president and the chairman of the college's board of trustees.*
>
> *(3) The System President shall recommend action on the college's curriculum program application to the State Board.*
>
> *(4) Approval to grant degrees, diplomas, and certificates shall be withdrawn if the State Board determines that a college is not maintaining approved programs or graduation requirements.*
>
> *SBCCC 02E.0201*

In addition, the State Board has adopted the attached Curriculum Program Application Procedures to guide community colleges in preparing and submitting applications for curriculum program approval.

Submission of Program Application:
Colleges seeking curriculum program approval should submit an application using the attached procedures. All items must be completed and documented as indicated before the program can be considered for approval by the State Board. Colleges are encouraged to contact the appropriate program coordinator at the System Office for assistance in the completion of this application. (See Section 7 of the *Curriculum Procedures Reference Manual* for a list of Program Coordinators).

Two (2) copies of the application with original signatures should be submitted to:

Senior Vice President and Chief Academic Officer
North Carolina Community College System Office
5016 Mail Service Center
Raleigh, North Carolina 27699-5016

Deadlines:
Program applications may be submitted at any time, but should be submitted within a reasonable amount of time after the initial planning notification.

Program applications for existing program titles that meet the following criteria will be "fast-tracked" and may be processed within 60 days of submission:

- The application is complete, requires no further analysis or documentation, and is received by the System Office by the first working day of the month;
- There are no negative impact assessments; and
- The college does not go outside of its service area for planning purposes.

Example Timeline
March 1 - Application received by System Office
April Board Meeting - System Office presents to Board as "**Fast Track for Action**"

Completed applications that do *not* meet the "Fast Track for Action" criteria that are received by the first working day of the month will be processed within 90 days of submission.

Example Timeline
March 1 - Application received by System Office
April Board Meeting - System Office presents to Board "**For Future Action**"
May Board Meeting - System Office presents to Board "**For Action**"

The approval process for applications which are received after the first working day of the month, are incomplete, or require further analysis may exceed this 90-day schedule. Since the State Board normally does not meet in June or December, application processing schedules which include these months may also exceed 90 days.

The *Three Year Accountability Report* must be submitted three years after program implementation.

CURRICULUM PROGRAM APPLICATION PROCEDURES

Instructions for Completing Attached Application:

All items must be completed and documented as indicated before the program can be considered for approval by the State Board. ***Please note that colleges may utilize the Special Curriculum Program Application process when applying for a concentration program if the applying college already has approval for the parent program.*** *Please see Section 3A of the Curriculum Procedures Manual for information concerning the Special Curriculum Program Application process.*

I. Program Planning

Items A and B should be presented in narrative format and include appropriate documentation to support the case for the proposed program. This narrative will serve as the primary resource for the State Board's consideration. The narrative is restricted to three to five pages.

A. Purpose:

Discuss the purpose of the proposed program and demonstrate how the proposed program directly relates to the mission of the college and the college's Institutional Effectiveness Plan.

B. Rationale:

Build a narrative case for starting the new program. The narrative may include the following: an analysis of employment opportunities using existing labor market databases; illuminating excerpts from letters of support from existing businesses and industries; an explanation of the tie-in to local or regional economic development board initiatives; or excerpts from letters of support from county commissioner boards, chambers of commerce, or other relevant stakeholders who can express significant need for the program to be implemented at the college. The rationale should also indicate the method of delivery for the program. Additional information may be provided to substantiate the college's rationale and justification for starting the new program.

C. Local Certification:

Complete the institutional certification. A copy of the minutes from the Board of Trustees meeting(s) at which the proposed program was discussed and approved must be attached to the application.

II. Program Planning Notification

Using the *Curriculum Program Planning Notification Form* to notify all community college presidents, all chief academic officers, and the Senior Vice President and Chief Academic Officer at the System Office that the college intends to apply for the proposed program.

In the notification, please indicate the intended planning area (the specific counties to be served by the program), as well as the anticipated starting semester. If the planning area includes counties served by other community colleges, please identify those colleges in the planning announcement. If the planning area is redefined as part of the application process, a revised program planning notification must be sent to all parties listed above.

Attach a copy of the notification to the application.

A separate notification is required for each program application.

This notification of the intent to apply for the proposed program does not imply or give proprietary right to any college to offer the proposed program.

III. Impact of the Proposed Program on Other Programs in the System

A. Impact Assessment Form

The applying college must send completed hard copies of the ***Impact Assessment Form*** to other colleges which have been identified as approved to offer the same or similar program(s). Please follow these guidelines:

- If the proposed program does NOT include a clinical requirement, send the Impact Assessment Form to colleges that are approved to offer the same or similar programs and that have a service area which is contiguous to the counties in your service area. The Impact Assessment Forms must document the perceived impact of implementing the proposed program on the existing program(s) at the contiguous colleges.
- If the proposed program includes a clinical requirement, send the Impact Assessment Form to all NCCCS colleges approved to offer the same or similar programs. The Impact Assessment Form should document the perceived impact of the proposed program on existing program(s) at other colleges, including the impact on clinical sites used by other colleges.

B. Documenting Impact Assessment

Include in the application a list of colleges who received an Impact Assessment Form and a narrative summary of the responses received. If the applying college does not receive a response from a college, please attempt to contact that college's president to obtain a response. Attach copies of signed Impact Assessment Forms from all responding college(s).

If the applying college receives a negative response as a result of the original Notification or the Impact Assessment Form, provide a narrative summary of the actions the college took to resolve the negative responses and the outcome of those actions. Document the outcome of a resolution meeting using the Impact Assessment Resolution Form.

C. Impact Assessment Conflict Resolution Appeals Process

If the college presidents cannot reach agreement on the impact of the proposed program, the Senior Vice President and Chief Academic Officer will refer the issue to the System President. If a meeting with the System President does not resolve the issues, the presidents may request a hearing before the Program Committee of the State Board. The Program Committee will make a recommendation to the State Board on the disposition of the proposed program. The State Board's decision regarding resolution of the matter is final.

IV. Implementation of Level III Instructional Service Agreement (ISA) Plan

(Required for both the "parent" and concentration program application, if applicable)

If the applying college intends to collaborate with one or more colleges to offer the proposed program, a Level III Instructional Agreement (ISA) should be included with the program application. Please utilize Section 6 of the *Curriculum Procedures Reference Manual* to obtain the guidelines and suggested format for Level III ISAs.

V. Proposed Program of Study

(Required for Both the "Parent" and Concentration Program Applications)

The proposed program of study should be designed to be in compliance with the curriculum standard approved by the State Board of Community Colleges. The State Board approved curriculum standard for each program is located at: http://www.nccommunitycolleges.edu/Programs/curriculum_standards.html.

The proposed program of study should also be designed using the appropriate courses listed in the *Combined Course Library* which is located at: http://www.nccommunitycolleges.edu/ccl.html.

VI. Three Year Accountability Report

A *Three Year Accountability Report* must be submitted three years after program implementation. The report must include information on enrollment, completers, employment, licensure/accreditation and other pertinent information.

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CURRICULUM PROGRAM APPLICATION

College _____

Program Title_____

Concentration Title_____
(If applicable)

Program Code __ __ __ __ __ __

Credential (*Indicate the highest credential to be awarded*)

_____ AAS _____ Diploma _____ Certificate

Proposed Semester and Year of Implementation

____ Spring _____ Summer _____Fall 20__ __

Contact Person (Name/Title): _____

Phone (_____)_____ Extension _____ E-mail_____

Does this application include the use of a Level III Instructional Service Agreement (ISA)?

_____ Yes _____ No

(If yes, please be sure to include the ISA with your application.)

I. Program Planning

Items A and B should be completed in a narrative format. ***This narrative is limited to three to five pages.***

A. Purpose: Provide a narrative which outlines the purpose of the proposed program and demonstrate how the proposed program directly relates to the mission of the college and the college's Institutional Effectiveness Plan. *(Attach additional completed pages.)*

B. Rationale: Build a narrative case for starting the new program. (See instructions provided on page 4.) *(Attach additional completed pages.)*

C. Institutional Certification: *Complete the following form and obtain required signatures. Form with original signatures should be included in the application.*

Institutional Certification

This curriculum program _____ _____
(Program Title) *(Program Code)*

will enhance the workforce of North Carolina, will provide educational and training opportunities consistent with the mission of the college, and will not duplicate the opportunities currently offered.

_____
(Community College Name)

has assessed the need for this program and the resources required to maintain a viable program and certifies that the college can operate this program efficiently and effectively within the resources available to the college.

The college understands that this proposed program will require a program accountability report that will include items such as student success measures, enrollment trends, completion rates, and employment data three years after implementation if the program is approved by the State Board.

(A copy of the minutes from the Board of Trustees meeting(s) where the proposed program was discussed and approved must be attached to the application.)

_____ _____
Signature, President of College *Date*

_____ _____
Signature, Board of Trustees Chair *Date*

II. Program Planning Notification: *Complete the form below and utilize to notify all community college presidents, chief academic officers, and the Senior Vice President and Chief Academic Officer at the System Office of your intent to apply for the proposed program. Include a copy of the completed form with the application.*

Curriculum Program Planning Notification

(Date of Notification)

_____ intends to initiate a planning process for _____.
College *Program Title/Code*

The planning process is expected to be completed by _____, with program implementation in
Date

_____, _____. The anticipated planning area to be served by this program is _____.
Semester *Year* *List Each County*

The following colleges are located within the planning area for the new program: _____
List colleges, if applicable

For colleges interested in participating in the planning process or learning about this new program, the contact

person for the program planning process is _____.
Include contact person's name and phone number

Note: If the planning area is redefined as part of the application process, a revised program planning notification must be sent to all parties listed above.

III. Impact of the Proposed Program on Other Programs in the System:

A. Impact Assessment Form*: The applying college should complete Section A or B, and sign. Send completed copies of the Impact Assessment Form to colleges which are approved to offer the same or similar program(s)(see guidelines provided on page 5). The college with the same or similar program should complete and sign their response. Include copies of signed forms in your application.*

Impact Assessment Form

Section A: (For Programs without a Clinical Requirement):

_____ intends to apply for approval to offer_____.
Applying College *Program Title/Code*

The college has determined that _____ is located in a contiguous
Name of college with same or similar program

service area and is currently offering the same or similar program entitled and coded as
.
Program Title/Code

Section B: (For Programs with a Clinical Requirement):

_____ intends to apply for approval to offer _____ which
Applying College *Program Title/Code*

contains a clinical requirement. The college has determined that _____
Name of college with same or similar program

is currently offering the same or similar program entitled and coded as _____.
Program Title/Code

The following clinical site(s) may be utilized in offering this program:

_____ _____

_____ _____

Impact Assessment:
Our college's assessment of the impact on your program is identified below:

_____

_____

_____ _____
Signature of President of Applying College *Date*

Response to Applying College:
Please indicate your response to this assessment within **two weeks** of the date of this form. (Failure to respond within two weeks may be construed as concurrence with the impact assessment.)

_____ Yes, I agree with the impact assessment. _____ No, I do not agree with the impact assessment.

If you do not agree with the impact assessment, please provide an explanation (use an additional page if needed):

_____

_____

_____ _____
Signature of President of College with Same or Similar Program *Date*

B. Documenting Impact Assessment: *Provide a list of colleges who received an Impact Assessment Form and a narrative of the responses received.*

Name of College(s) Receiving Impact Assessment Form	**Program Title**

Narrative of Responses Received: _____
_____
_____
_____
_____
_____
_____

If a negative response was received, provide a narrative summary of the actions taken to resolve the negative response and the outcome of those actions:
_____
_____
_____
_____
_____

If a negative response was received, document the outcome of the resolution by completing the following Impact Resolution Form. Include copies of the signed resolution in the application.

Impact Assessment Resolution Form

_____ intends to apply for approval to offer _____.
Applying College *Program Title/Code*

_____ has identified that there will be an impact on its program. The identified
College with Same or Similar Program

impact is:_____

_____

_____

_____ has resolved the possible impact by: _____
Applying College

_____

_____

_____

_____ _____
Signature of President of Applying College *Date*

Response to Applying College:
Please indicate your response to this impact assessment resolution within **two weeks** of the date of this form. (Failure to respond within two weeks may be construed as concurrence with the impact assessment resolution.)

_____ Yes, I agree with the impact assessment resolution identified above.

_____ No, I do not agree with the impact assessment resolution identified above.

If you do not agree with the impact assessment resolution identified above, please provide an explanation (attach an additional page if needed): _____

_____

_____

_____ _____
Signature of President of College with Same or Similar Program *Date*

IV. Level III Instructional Service Agreement (ISA): *Include a Level III Instructional Service Agreement with the application if the applying college intends to collaborate with one or more colleges to offer the proposed program. (See Section 6 of the Curriculum Procedures Reference Manual for guidelines.)*

V. Proposed Program of Study: *Complete the following to indicate the proposed program of study.*

A. 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.*

1. Communication:

The following course(s) are required:

Course Number Course Title (Credit)

ENG 111 Expository Writing (3) (Example format)

Communication Pick List if applicable:

Select a course(s) from the following:

2.Humanities/Fine Arts:

The following course(s) are required:

Course Number Course Title (Credit)

Humanities/Fine Arts Pick List if applicable:

Select a course(s) from the following:

3.Social/Behavioral Sciences:

The following course(s) are required:

Course Number Course Title (Credit)

Social/Behavioral Pick List if applicable:

Select a course(s) from the following:

4.Natural Sciences/Mathematics:

The following course(s) are required:

Course Number Course Title (Credit)

Natural Sciences/Mathematics Pick List if applicable:

Select a course(s) from the following:

Total General Education Semester Hour Credits Required _____

Program of Study (Continued)

B. MAJOR HOURS

1. Core

The core is comprised of specific courses and/or subject areas which are required for each curriculum program. These are identified on the curriculum standard for each program.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Core Semester Hour Credits____

2. Concentration (if applicable)

If the proposed program is a concentration, please list the required courses and/or subject areas. Only utilize the courses and/or subject areas identified on the curriculum standard.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Concentration Semester Hour Credits_____

Program of Study (Continued)

3. 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 unique prefixes as noted on the standard.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Other Major Semester Hour Credits ____

Total Major Semester Hour Credits_____

Please note:
Work experience 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.

Selected topics or seminar curriculum courses may be included in associate in applied science degree up to a maximum of 3 semester hours of credit; and in diploma or certificate programs up to a maximum of 3 semester hours of credit. Such curriculum courses shall be listed on a program of study as "other major" hours. Selected topics and seminar curriculum courses shall not be used more than once in a program.

Program of Study (Continued)

C. OTHER REQUIRED COURSES *(If applicable)*

A college may require other courses in order to meet graduation or local employer requirements. These requirements may be met through a maximum of 7 semester hours of credit in a degree program; 4 semester hours of credit in a diploma program, and 1 semester hour of credit in a certificate program. Restricted, unique or free elective courses may not be included as other required courses.

The following course(s) are required:

Course Number Course Title (Credit)

Total Other Required Semester Hour Credits_____

Total Semester Hours Credit in Program_____

Course Substitution (if applicable)

Course in Program_____ Substitute Course(s)_____

Course in Program_____ Substitute Course(s)_____

VI. Three Year Accountability Report: *The Three Year Accountability Report must be submitted three years <u>after</u> program implementation. Use the following template for the report.*

NCCCS New Curriculum Program Application Procedures
Template for
Three Year Accountability Report

Name of College:

_____

Title of Curriculum Program:_____

Date of State Board Approval:_____

Semester Program Started at College: Fall □ Spring □ Summer □ 20_ _

Number of Students Enrolled in Program Annually Since Implementation:
(Please break down by certificate/diploma/AAS level if applicable.)

First Year _____

Second Year _____

Third Year _____

Number of Program Completers by Year: *(Include additional years if applicable.)*

First Year _____ Certificate_____ Diploma_____ AAS_____

Second Year _____ Certificate_____ Diploma_____ AAS_____

Third Year _____ Certificate_____ Diploma_____ AAS_____

Graduates Employment:

- Number and Percentage of Graduates Employed in Major or Related Field
  First Graduating Class: _____ _____%
  Second Graduating Class: _____ _____%

- Number and Percentage of Graduates Employed in Other Fields
  First Graduating Class: _____ _____%
  Second Graduating Class: _____ _____%

- Number and Percentage of Students Continuing Education
  _____ _____%

Program Outlook for Next Five Years (Brief Narrative)

Are there external accrediting or licensing requirements for this program?

Yes □ No □

If so, please provide date of accreditation/approval: _____ 20 _ _

or projected date of accreditation/approval: _____ 20 _ _

Attach minutes of local advisory committee meetings since program implementation.

Attach any other information pertaining to the program.

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Curriculum Procedures Reference Manual
Section 3A

Special Curriculum Program Application for Selected Curriculum Titles Procedures and Accountability Report

(Associate in Applied Science, Diploma, and Certificate Selected Curriculum Programs)

Implementation October 1, 2012

North Carolina Community College System
Special Curriculum Program Application Procedures and Accountability Report for Selected Curriculum Titles

The State Board of Community Colleges is authorized to approve curriculum programs (23 SBCCC 02E .0201). The State Board has delegated to the President of the North Carolina Community College System the authority to approve new curriculum programs utilizing the special application process for the selected titles. Curriculum programs recommended to the State Board for placement on the Special Curriculum Application process list by a college or by System Office staff must meet the following criteria to be eligible:

1. *There is a widespread, immediate need for the job training and there will be minimal impact on college programs if multiple colleges offer the program; or*
2. *The program is a concentration (applying college must be approved to offer the parent program.)*

The following curriculums have been approved by the State Board of Community Colleges for the Special Application process:

- Community Spanish Interpreter (A55370)
- Entrepreneurship (A25490)
- Global Logistics (A25170)
- Industrial Systems Technology (A50240)
- Infant/Toddler Care (Certificate)(C55290)
- Information Systems Security (A25270)
- Lateral Entry (Certificate)(C55430)
- Low Impact Development (A40290)
- Medical Office Administration (A25310)
- Networking Technology (A25340)
- School-Age Care (Certificate)(C55450)
- Sustainability Technologies (A40370)
- Web Technologies (A25290)
- Welding Technology (A50420)

The following curriculums have been approved by the State Board of Community Colleges for the Special Application process, but require that the college have prior approval for the Cosmetology (A55140) program:

- Cosmetology Instructor (Certificate)(C55160)
- Esthetics Instructor (Certificate)(C55270)
- Esthetics Technology (Certificate)(C55230)
- Manicuring Instructor (Certificate)(C55380)
- Manicuring/Nail Tech. (Certificate)(C55400)

The following curriculum has been approved by the State Board of Community Colleges for the Special Application process, but requires that the college have prior approval for the Real Estate (A25400) program:

- Real Estate Licensing (Certificate) (C25480)

The following curriculum has been approved by the State Board of Community Colleges for the Special Application process, but requires that the college have prior approval for the Culinary Arts (A55150) program:

- Foodservice Technology (Diploma) (D55250)

<u>All</u> concentrations have been approved by the State Board of Community Colleges for the Special Application process, but require that the college have prior approval for the parent program. See Section 7 of the Curriculum Procedures Reference Manual for a list of concentration/parent programs.

Submission of Special Program Application:
Colleges seeking curriculum program approval process, through the special application process, should submit an application using the attached procedures. The following items must be completed and documented as indicated before the program can be considered for approval by the State Board:

1) Local Certification
2) Proposed Program of Study
3) Impact Assessment Form(s) from colleges in counties contiguous to applying college's service area approved to offer the same or similar program; *and*
4) Three Year Accountability Report (must be submitted three years after program implementation)

Two (2) copies of the application with original signatures on each copy should be submitted to:

Senior Vice President and Chief Academic Officer
North Carolina Community Colleges System Office
5016 Mail Service Center
Raleigh, North Carolina 27699-5016

Deadlines:
Special program applications may be submitted at any time. Please allow approximately three weeks for System Office review and approval. Colleges will be notified of program approval and will be instructed to submit an electronic program of study. Approval of the program and the program of study must be complete prior to implementation of the program.

SPECIAL CURRICULUM PROGRAM APPLICATION PROCEDURES

Instructions for Completing Attached Application:

All items must be completed and documented as indicated before the program can be considered for approval by the System Office. Please note that colleges may only utilize the Special Curriculum Program Application process when applying for a concentration program if the applying college already has approval for the parent program or when applying for an approved special application program title. See page 2 for a list of approved titles.

I. Local Certification:

Complete the institutional certification form. A copy of the minutes from the Board of Trustees meeting(s) at which the proposed program was discussed and approved must be attached to the application.

II. Proposed Program of Study

The proposed program of study should be designed to be in compliance with the curriculum standard approved by the State Board of Community Colleges. The State Board approved curriculum standard for each program is located at:
http://www.nccommunitycolleges.edu/Programs/curriculum_standards.html.

The proposed program of study should also be designed using the appropriate courses from the *Combined Course Library* which is located at: http://www.nccommunitycolleges.edu/ccl.html.

III. Impact of the Proposed Program on Other Programs in the System

A. Impact Assessment Form

The applying college must send completed hard copies of the ***Impact Assessment Form*** to any college that is approved to offer the same or similar program and which is contiguous to the counties in the applying college's service area. The Impact Assessment Forms must document the perceived impact of implementing the proposed program on the existing program(s) at the contiguous colleges.

B. Documenting Impact Assessment

Include in the application a list of colleges who received an Impact Assessment Form and a narrative summary of the responses received. If the applying college does not receive a response from a college, please attempt to contact that college's president to obtain a response. Attach copies of signed Impact Assessment Forms from all responding college(s).

If the applying college receives a negative response as a result of the original Notification or the Impact Assessment Form, provide a narrative summary of the actions the college took to resolve the negative responses and the outcome of those actions. Document the outcome of a resolution meeting using the Impact Assessment Resolution Form.

C. Impact Assessment Conflict Resolution Appeals Process

If the college presidents cannot reach agreement on the impact of the proposed program, the Senior Vice President and Chief Academic Officer will refer the issue to the System President. If a meeting with the System President does not resolve the issues, the presidents may request a hearing before the Program Committee of the State Board. The Program Committee will make a recommendation to the State Board on the disposition of the proposed program. The State Board's decision regarding resolution of the matter is final.

IV. Three Year Accountability Report

A *Three Year Accountability Report* must be submitted by the college three years after program implementation. The report must include information on enrollment, completers, employment, licensure/accreditation and other pertinent information.

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SPECIAL CURRICULUM PROGRAM APPLICATION

College _____
Program Title_____
Concentration Title_____
(If applicable)

Program Code __ __ __ __ __ __

Credential (*Indicate the highest credential to be awarded*)

_____ AAS _____ Diploma _____ Certificate

Proposed Semester and Year of Implementation

____ Spring _____ Summer _____Fall 20__ __

Contact Person (Name/Title): _____

Phone (_____)_____ Extension _____ E-mail_____

Does this application include the use of a Level III Instructional Service Agreement (ISA)?

_____ Yes _____ No

(If yes, please be sure to include the ISA with your application.)

I. Institutional Certification: *Complete the following form and obtain required signatures. Form with*

original signatures should be included in the application.

Institutional Certification

This curriculum program _____ _____
(Program Title) *(Program Code)*

will enhance the workforce of North Carolina, will provide educational and training opportunities consistent with the mission of the college, and will not duplicate the opportunities currently offered.

_____
(Community College Name)

has assessed the need for this program and the resources required to maintain a viable program and certifies that the college can operate this program efficiently and effectively within the resources available to the college.

The college understands that this proposed program will require a program accountability report that will include items such as student success measures, enrollment trends, completion rates, and employment data three years after implementation if the program is approved by the State Board.

(A copy of the minutes from the Board of Trustees meeting(s) where the proposed program was discussed and approved must be attached to the application.)

_____ _____
Signature, President of College *Date*

_____ _____
Signature, Board of Trustees Chair *Date*

II. Proposed Program of Study: *Complete the following to indicate the proposed program of study.*

A. 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.*

1. Communication:

The following course(s) are required:

Course Number Course Title (Credit)

ENG 111 Expository Writing (3) (Example format)

Communication Pick List if applicable:

Select a course(s) from the following:

2.Humanities/Fine Arts:

The following course(s) are required:

Course Number Course Title (Credit)

Humanities/Fine Arts Pick List if applicable:

Select a course(s) from the following:

3.Social/Behavioral Sciences:

The following course(s) are required:

Course Number Course Title (Credit)

Social/Behavioral Pick List if applicable:

Select a course(s) from the following:

4.Natural Sciences/Mathematics:

The following course(s) are required:

Course Number Course Title (Credit)

Natural Sciences/Mathematics Pick List if applicable:

Select a course(s) from the following:

Total General Education Semester Hour Credits Required _____

Program of Study (Continued)

B. MAJOR HOURS

1. Core

The core is comprised of specific courses and/or subject areas which are required for each curriculum program. These are identified on the curriculum standard for each program.

The following course(s) are required:
Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Core Semester Hour Credits____

2. Concentration (if applicable)

If the proposed program is a concentration, please list the required courses and/or subject areas. Only utilize the courses and/or subject areas identified on the curriculum standard.

The following course(s) are required:
Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Concentration Semester Hour Credits_____

Program of Study (Continued)

3. 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 unique prefixes as noted on the standard.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Other Major Semester Hour Credits ____

Total Major Semester Hour Credits_____

Please note:
Work experience 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.

Selected topics or seminar curriculum courses may be included in associate in applied science degree up to a maximum of 3 semester hours of credit; and in diploma or certificate programs up to a maximum of 3 semester hours of credit. Such curriculum courses shall be listed on a program of study as "other major" hours. Selected topics and seminar curriculum courses shall not be used more than once in a program.

Program of Study (Continued)

C. OTHER REQUIRED COURSES *(If applicable)*

A college may require other courses in order to meet graduation or local employer requirements. These requirements may be met through a maximum of 7 semester hours of credit in a degree program; 4 semester hours of credit in a diploma program, and 1 semester hour of credit in a certificate program. Restricted, unique or free elective courses may not be included as other required courses.

The following course(s) are required:

Course Number Course Title (Credit)

Total Other Required Semester Hour Credits_____

Total Semester Hours Credit in Program_____

Course Substitution (if applicable)

Course in Program_____ Substitute Course(s)_____

Course in Program_____ Substitute Course(s)_____

III. Impact of the Proposed Program on Other Programs in the System:

A. Impact Assessment Form: *The applying college should complete the impact assessment form and sign. Send completed copies of the Impact Assessment Form to colleges which are approved to offer the same of similar program(s) and which are located in counties which are contiguous to counties in your college's service area. The college with the same or similar program should complete and sign their response. Include copies of signed forms in your application.*

Impact Assessment Form – Special Curriculum Program Application

_____ intends to apply for approval to offer _____.
Applying College *Program Title/Concentration Title/Code*

The college has determined that _____ is located in a contiguous county
Name of college with same or similar program

and is currently offering the same or similar program entitled and coded as _____.
Program Title/Concentration Title/ Code

Our college's assessment of the impact on your program is identified below:

_____

_____

_____

_____

_____ _____
Signature of President of Applying College *Date*

Please indicate your response to this assessment within **two weeks** of the date of this form. (Failure to respond within two weeks may be construed as concurrence with the impact assessment.)

_____ Yes, I agree with the impact assessment. _____ No, I do not agree with the impact assessment.

_____ Explanation (attach additional comments on other pages): _____

_____

_____

_____ _____
Signature of President of College with Same or Similar Program *Date*

B. Documenting Impact Assessment: *Provide a list of colleges who received an Impact Assessment Form and a narrative of the responses received.*

Name of College(s) Receiving Impact Assessment Form	**Program Title *(Same or Similar)***

Narrative of Responses Received: _____
_____
_____
_____
_____
_____
_____

If a negative response was received, provide a narrative summary of the actions taken to resolve the negative response and the outcome of those actions:
_____
_____
_____
_____
_____

C. Impact Assessment Resolution: *If a negative response was received, document the outcome of the resolution by completing the following Impact Resolution Form. Include copies of the signed resolution in the application.*

Impact Assessment Resolution Form

_____ intends to apply for approval to offer _____.
Applying College *Program Title/Concentration Title/ Code*

_____ has identified that there will be an impact on its program. The identified impact is:
College with Same or Similar Program

_____

_____

_____

_____ has resolved the possible impact by:
Applying College

_____

_____

_____

_____

_____ _____
Signature of President of Applying College *Date*

Please indicate your response to this impact assessment resolution within **two weeks** of the date of this form. (Failure to respond within two weeks may be construed as concurrence with the impact assessment resolution.)

_____ Yes, I agree with the impact assessment resolution identified above.

_____ No, I do not agree with the impact assessment resolution identified above.

_____ Explanation (attach additional comments on other pages): _____

_____

_____

_____

_____ _____
Signature of President of College with Same or Similar Program *Date*

IV. Three Year Accountability Report: *The Three Year Accountability Report must be submitted three years <u>after</u> program implementation. Use the following template for the report.*

NCCCS New Curriculum Program Application Procedures
Template for
Three Year Accountability Report

Name of College: _____

Title of Curriculum Program:_____

Date of State Board Approval:_____

Semester Program Started at College: Fall □ Spring □ Summer □ 20_ _

Number of Students Enrolled in Program Annually Since Implementation:
(Please break down by certificate/diploma/AAS level if applicable.)

First Year _____
Second Year _____
Third Year _____

Number of Program Completers by Year: *(Include additional years if applicable.)*

First Year _____ Certificate_____ Diploma_____ AAS_____

Second Year _____ Certificate_____ Diploma_____ AAS_____

Third Year _____ Certificate_____ Diploma_____ AAS_____

Graduates Employment:

- Number and Percentage of Graduates Employed in Major or Related Field
  First Graduating Class: _____ _____%
  Second Graduating Class: _____ _____%

- Number and Percentage of Graduates Employed in Other Fields
  First Graduating Class: _____ _____%
  Second Graduating Class: _____ _____%

- Number and Percentage of Students Continuing Education
  _____ _____%

Program Outlook for Next Five Years (Brief Narrative)

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Curriculum Procedures Reference Manual
Section 3B

Curriculum Program Application for a New-to-the-System Program Title Procedures and Accountability Report

(New-to-the-System Associate in Applied Science, Diploma, and Certificate Curriculums)

Implementation October 1, 2012

North Carolina Community College System
Curriculum Program Application Procedures and Accountability Report for New-to-the-System Program Titles

The State Board of Community Colleges has established rules to guide the approval of programs:

(1) *The approval of a college or of a group of colleges in a collaborative arrangement to award the associate degree, diploma, or certificate shall be by individual curriculum program title. Approval by the State Board shall be granted when the college has demonstrated an established need and has provided evidence to the State Board of sufficient instructional faculty, facilities, equipment, and materials required to meet the needs of the communities served without supplanting or duplicating existing programs.*

(2) *The application shall be signed by the college president and the chairman of the college's board of trustees.*

(3) *The System President shall recommend action on the college's curriculum program application to the State Board.*

(4) *Approval to grant degrees, diplomas, and certificates shall be withdrawn if the State Board determines that a college is not maintaining approved programs or graduation requirements.*

SBCCC 02E.0201

In addition, the State Board has adopted the attached Curriculum Program Application Procedures to guide community colleges in preparing and submitting applications for curriculum program approval.

Submission of Program Application:
Colleges seeking curriculum program approval should submit an application using the attached procedures. All items must be completed and documented as indicated before the program can be considered for approval by the State Board. Colleges are encouraged to contact the appropriate program coordinator at the System Office for assistance in the completion of this application. (See Section 7 of the *Curriculum Procedures Reference Manual* for a list of Program Coordinators).

Two (2) copies of the application with original signatures should be submitted to:

Senior Vice President and Chief Academic Officer
North Carolina Community College System Office
5016 Mail Service Center
Raleigh, North Carolina 27699-5016

Deadlines:

Program applications may be submitted at any time, but should be submitted within a reasonable amount of time after the initial planning notification.

Completed applications that are received by the first working day of the month will be processed within 90 days of submission.

Example Timeline

March 1 - Application received by System Office
April Board Meeting - System Office presents to Board "**For Future Action**"
May Board Meeting - System Office presents to Board "**For Action**"

The approval process for applications which are received after the first working day of the month, are incomplete, or require further analysis may exceed this 90-day schedule. Since the State Board normally does not meet in June or December, application processing schedules which include these months may also exceed 90 days.

The *Three Year Accountability Report* must be submitted three years after program implementation.

CURRICULUM PROGRAM APPLICATION PROCEDURES

Instructions for Completing Attached Application:

All items must be completed and documented as indicated before the program can be considered for approval by the State Board.

I. Program Planning

Items A and B should be presented in narrative format and include appropriate documentation to support the case for the proposed program. This narrative will serve as the primary resource for the State Board's consideration. The narrative is restricted to three to five pages.

A. Purpose:

Discuss the purpose of the proposed program and demonstrate how the proposed program directly relates to the mission of the college and the college's Institutional Effectiveness Plan.

B. Rationale:

Build a narrative case for starting the new program. The narrative may include the following: an analysis of employment opportunities using existing labor market databases; illuminating excerpts from letters of support from existing businesses and industries; an explanation of the tie-in to local or regional economic development board initiatives; or excerpts from letters of support from county commissioner boards, chambers of commerce, or other relevant stakeholders who can express significant need for the program to be implemented at the college. The rationale should also indicate the method of delivery for the program. Additional information may be provided to substantiate the college's rationale and justification for starting the new program.

C. Local Certification:

Complete the institutional certification. A copy of the minutes from the Board of Trustees meeting(s) at which the proposed program was discussed and approved must be attached to the application.

II. Program Planning Notification

Using the *Curriculum Program Planning Notification Form* to notify all community college presidents, all chief academic officers, and the Senior Vice President and Chief Academic Officer at the System Office that the college intends to apply for the proposed program.

In the notification, please indicate the intended planning area (the specific counties to be served by the program), as well as the anticipated starting semester. If the planning area includes counties served by other community colleges, please identify those colleges in the planning announcement. If the planning area is redefined as part of the application process, a revised program planning notification must be sent to all parties listed above.

Attach a copy of the notification to the application.

A separate notification is required for each program application.

This notification of the intent to apply for the proposed program does not imply or give proprietary right to any college to offer the proposed program.

III. Impact of the Proposed Program on Other Programs in the System

A. Impact Assessment Form

The applying college must send completed hard copies of the ***Impact Assessment Form*** to other colleges which have been identified as approved to offer the same or similar program(s). Please follow these guidelines:

- If the proposed program does NOT include a clinical requirement, send the Impact Assessment Form to colleges that are approved to offer the same or similar programs and that have a service area which is contiguous to the counties in your service area. The Impact Assessment Forms must document the perceived impact of implementing the proposed program on the existing program(s) at the contiguous colleges.
- If the proposed program includes a clinical requirement, send the Impact Assessment Form to all NCCCS colleges approved to offer the same or similar programs. The Impact Assessment Form should document the perceived impact of the proposed program on existing program(s) at other colleges, including the impact on clinical sites used by other colleges.

B. Documenting Impact Assessment

Include in the application a list of colleges who received an Impact Assessment Form and a narrative summary of the responses received. If the applying college does not receive a response from a college, please attempt to contact that college's president to obtain a response. Attach copies of signed Impact Assessment Forms from all responding college(s).

If the applying college receives a negative response as a result of the original Notification or the Impact Assessment Form, provide a narrative summary of the actions the college took to resolve the negative responses and the outcome of those actions. Document the outcome of a resolution meeting using the Impact Assessment Resolution Form.

C. Impact Assessment Conflict Resolution Appeals Process

If the college presidents cannot reach agreement on the impact of the proposed program, the Senior Vice President and Chief Academic Officer will refer the issue to the System President. If a meeting with the System President does not resolve the issues, the presidents may request a hearing before the Program Committee of the State Board. The Program Committee will make a recommendation to the State Board on the disposition of the proposed program. The State Board's decision regarding resolution of the matter is final.

IV. Implementation of Level III Instructional Service Agreement (ISA) Plan

(Required for both the "parent" and concentration program application, if applicable)

If the applying college intends to collaborate with one or more colleges to offer the proposed program, a Level III Instructional Agreement (ISA) should be included with the program application. Please utilize Section 6 of the *Curriculum Procedures Reference Manual* to obtain the guidelines and suggested format for Level III ISAs.

V. Proposed Program of Study

(Required for Both the "Parent" and Concentration Program Applications)

The proposed program of study should be designed to be in compliance with the curriculum standard approved by the State Board of Community Colleges. The State Board approved curriculum standard for each program is located at: http://www.nccommunitycolleges.edu/Programs/curriculum_standards.html.

The proposed program of study should also be designed using the appropriate courses listed in the *Combined Course Library* which is located at: http://www.nccommunitycolleges.edu/ccl.html.

VI. Proposed Curriculum Standard

(Required for Both the "Parent" and Concentration Program Applications)

The proposed *traditional* Curriculum Standard should include:

A. Curriculum Description. The curriculum description should briefly describe the program, including statements concerning the purpose of the curriculum, subject areas or types of courses offered, and special features associated with the program.

B. Core Courses. List all the curriculum courses that must be included in the core as required courses or the standard. Include course credit hours and the total number of credit hours for the core. ***A minimum of 12 semester credit hours is required in the core.***

C. Concentrations (if applicable)**.** List all courses required for the concentration under the proposed curriculum standard. Identify those courses that are unique to the concentration and, therefore, may not be offered except in the concentration. Include credit hours for the courses and total hours for the concentration. ***A minimum of 12 semester credit hours is required in the concentration. The majority of the credit hours must be unique to the concentration.***

D. Other Major Hours. List all curriculum prefixes that would be appropriate for use when selecting courses to complete the local Program of Study. A maximum of 9 semester hours of credit (shc) may be selected from any prefix listed, with the exception of prefixes listed in the core or concentration which may utilize more than 9 shc.

If the applying college would like to utilize a curriculum standard which is aligned with a career cluster, the elements identified above should be included along with an indication of the appropriate career cluster, pathway, technical core, program major courses, recommended general education and employability competencies. The applying college should contact the appropriate Program Coordinator at the System Office to determine whether a cluster model curriculum standard should be utilized.

VII. New Courses

If the application contains courses new to the *Combined Course Library*, please submit the proposed course including the proposed course title, hours, pre/corequisites (if applicable), course description, student learning outcomes (if applicable) and restrictions (if applicable). New courses will be reviewed by the State Board and are not required to be submitted to the Curriculum Review Committee (CRC).

VIII. Three Year Accountability Report

A *Three Year Accountability Report* must be submitted three years after program implementation. The report must include information on enrollment, completers, employment, licensure/accreditation and other pertinent information.

NC Community Colleges

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CURRICULUM PROGRAM APPLICATION

College _____

Program Title_____

Concentration Title_____
(If applicable)

Program Code __ __ __ __ __ __

Credential (*Indicate the highest credential to be awarded*)

_____ AAS _____ Diploma _____ Certificate

Proposed Semester and Year of Implementation

____ Spring _____ Summer _____Fall 20__ __

Contact Person (Name/Title): _____

Phone (_____)_____ Extension _____ E-mail_____

Does this application include the use of a Level III Instructional Service Agreement (ISA)?

_____ Yes _____ No

(If yes, please be sure to include the ISA with your application.)

I. Program Planning

Items A and B should be completed in a narrative format. ***This narrative is limited to three to***

five pages.

A. Purpose: Provide a narrative which outlines the purpose of the proposed program and demonstrate how the proposed program directly relates to the mission of the college and the college's Institutional Effectiveness Plan. *(Attach additional completed pages.)*

B. Rationale: Build a narrative case for starting the new program. (See instructions provided on page 4.) *(Attach additional completed pages.)*

C. Institutional Certification: *Complete the following form and obtain required signatures. Form with original signatures should be included in the application.*

Institutional Certification

This curriculum program _____ _____
(Program Title) *(Program Code)*

will enhance the workforce of North Carolina, will provide educational and training opportunities consistent with the mission of the college, and will not duplicate the opportunities currently offered.

_____
(Community College Name)

has assessed the need for this program and the resources required to maintain a viable program and certifies that the college can operate this program efficiently and effectively within the resources available to the college.

The college understands that this proposed program will require a program accountability report that will include items such as student success measures, enrollment trends, completion rates, and employment data three years after implementation if the program is approved by the State Board.

(A copy of the minutes from the Board of Trustees meeting(s) where the proposed program was discussed and approved must be attached to the application.)

_____ _____
Signature, President of College *Date*

_____ _____
Signature, Board of Trustees Chair *Date*

II. Program Planning Notification: *Complete the form below and utilize to notify all community college presidents, chief academic officers, and the Senior Vice President and Chief Academic Officer at the System Office of your intent to apply for the proposed program. Include a copy of the completed form with the application.*

Curriculum Program Planning Notification

(Date of Notification)

_____ intends to initiate a planning process for _____.
College *Program Title/Code*

The planning process is expected to be completed by _____, with program implementation in
Date

_____, _____. The anticipated planning area to be served by this program is _____.
Semester *Year* *List Each County*

The following colleges are located within the planning area for the new program: _____
List colleges, if applicable

For colleges interested in participating in the planning process or learning about this new program, the contact

person for the program planning process is _____.
Include contact person's name and phone number

Note: If the planning area is redefined as part of the application process, a revised program planning notification must be sent to all parties listed above.

III. Impact of the Proposed Program on Other Programs in the System:

A. Impact Assessment Form*: The applying college should complete Section A or B, and sign. Send completed copies of the Impact Assessment Form to colleges which are approved to offer the same or similar program(s)(see guidelines provided on page 5). The college with the same or similar program should complete and sign their response. Include copies of signed forms in your application.*

Impact Assessment Form

Section A: (For Programs without a Clinical Requirement):

_____ intends to apply for approval to offer_____.
Applying College *Program Title/Code*

The college has determined that _____ is located in a contiguous
Name of college with same or similar program

service area and is currently offering the same or similar program entitled and coded as
.
Program Title/Code

Section B: (For Programs with a Clinical Requirement):

_____ intends to apply for approval to offer _____ which
Applying College *Program Title/Code*

contains a clinical requirement. The college has determined that _____
Name of college with same or similar program

is currently offering the same or similar program entitled and coded as _____.
Program Title/Code

The following clinical site(s) may be utilized in offering this program:

_____ _____

_____ _____

Impact Assessment:
Our college's assessment of the impact on your program is identified below:

_____

_____

_____ _____
Signature of President of Applying College *Date*

Response to Applying College:
Please indicate your response to this assessment within **two weeks** of the date of this form. (Failure to respond within two weeks may be construed as concurrence with the impact assessment.)

_____ Yes, I agree with the impact assessment. _____ No, I do not agree with the impact assessment.

If you do not agree with the impact assessment, please provide an explanation (use an additional page if needed):

_____

_____

_____ _____
Signature of President of College with Same or Similar Program *Date*

B. Documenting Impact Assessment: *Provide a list of colleges who received an Impact Assessment Form and a narrative of the responses received.*

Name of College(s) Receiving Impact Assessment Form	**Program Title**

Narrative of Responses Received: _____
_____
_____
_____
_____
_____
_____

If a negative response was received, provide a narrative summary of the actions taken to resolve the negative response and the outcome of those actions:
_____
_____
_____
_____
_____

If a negative response was received, document the outcome of the resolution by completing the following Impact Resolution Form. Include copies of the signed resolution in the application.

Impact Assessment Resolution Form

_____ intends to apply for approval to offer _____.
Applying College *Program Title/Code*

_____ has identified that there will be an impact on its program. The identified
College with Same or Similar Program

impact is:_____

_____

_____

_____ has resolved the possible impact by: _____
Applying College

_____

_____

_____

_____ _____
Signature of President of Applying College *Date*

Response to Applying College:
Please indicate your response to this impact assessment resolution within **two weeks** of the date of this form. (Failure to respond within two weeks may be construed as concurrence with the impact assessment resolution.)

_____ Yes, I agree with the impact assessment resolution identified above.

_____ No, I do not agree with the impact assessment resolution identified above.

If you do not agree with the impact assessment resolution identified above, please provide an explanation (attach an additional page if needed): _____

_____

_____

_____ _____
Signature of President of College with Same or Similar Program *Date*

IV. Level III Instructional Service Agreement (ISA): *Include a Level III Instructional Service Agreement with the application if the applying college intends to collaborate with one or more colleges to offer the proposed program. (See Section 6 of the Curriculum Procedures Reference Manual for guidelines.)*

V. Proposed Program of Study: *Complete the following to indicate the proposed program of study.*

A. 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.*

1. Communication:

The following course(s) are required:

Course Number Course Title (Credit)

ENG 111 Expository Writing (3) (Example format)

Communication Pick List if applicable:

Select a course(s) from the following:

2.Humanities/Fine Arts:

The following course(s) are required:

Course Number Course Title (Credit)

Humanities/Fine Arts Pick List if applicable:

Select a course(s) from the following:

3.Social/Behavioral Sciences:

The following course(s) are required:

Course Number Course Title (Credit)

Social/Behavioral Pick List if applicable:

Select a course(s) from the following:

4.Natural Sciences/Mathematics:

The following course(s) are required:

Course Number Course Title (Credit)

Natural Sciences/Mathematics Pick List if applicable:

Select a course(s) from the following:

Total General Education Semester Hour Credits Required _____

Program of Study (Continued)

B. MAJOR HOURS

1. Core

The core is comprised of specific courses and/or subject areas which are required for each curriculum program. These are identified on the curriculum standard for each program.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Core Semester Hour Credits____

2. Concentration (if applicable)

If the proposed program is a concentration, please list the required courses and/or subject areas. Only utilize the courses and/or subject areas identified on the curriculum standard.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Concentration Semester Hour Credits_____

Program of Study (Continued)

3. 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 unique prefixes as noted on the standard.

The following course(s) are required:

Course Number Course Title (Credit)

Required Subject Area(s) if applicable:

Total Other Major Semester Hour Credits ____

Total Major Semester Hour Credits_____

Please note:
Work experience 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.

Selected topics or seminar curriculum courses may be included in associate in applied science degree up to a maximum of 3 semester hours of credit; and in diploma or certificate programs up to a maximum of 3 semester hours of credit. Such curriculum courses shall be listed on a program of study as "other major" hours. Selected topics and seminar curriculum courses shall not be used more than once in a program.

Program of Study (Continued)

C. OTHER REQUIRED COURSES *(If applicable)*

A college may require other courses in order to meet graduation or local employer requirements. These requirements may be met through a maximum of 7 semester hours of credit in a degree program; 4 semester hours of credit in a diploma program, and 1 semester hour of credit in a certificate program. Restricted, unique or free elective courses may not be included as other required courses.

The following course(s) are required:

Course Number Course Title (Credit)

Total Other Required Semester Hour Credits_____

Total Semester Hours Credit in Program_____

Course Substitution (if applicable)

Course in Program_____ Substitute Course(s)_____

Course in Program_____ Substitute Course(s)_____

VI. Proposed **Curriculum Standard**

Program Title:_____ Program Code:_____
Concentration Title (if applicable):_____
Effective Term: ___ Fall, ___Summer or ___ Spring of 201_. (Year)

Curriculum Description *Complete this section using three paragraphs which define intent, content and graduate qualifications. Paragraphs are limited to three sentences with a maximum of 40 words for the paragraph*

Intent of the Curriculum utilizing terms such as:
This curriculum (is designed to..., prepares individuals..., provides...., etc.)

Curriculum Content utilizing statements such as:
Course work includes..., Students will..., etc.

Graduates should qualify for or accomplish (Include certifications, licensure examinations, employment opportunities, etc.)

*Curriculum Requirements**

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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(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 in Program	**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

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 of 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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

Curriculum Title/Curriculum Code			
	AAS	**Diploma**	**Certificate**
Minimum Major Hours Required	**49 SHC**	**30 SHC**	**12 SHC**
A. CORE **Required Courses:** *(List required course titles/hours. Use an * to identify courses that are required for a diploma if applicable.)* **Required Subject Areas:** *(List subject areas if applicable.)*			
B. CONCENTRATION *(list concentration courses if applicable)*			
C. OTHER MAJOR HOURS *To be selected from the following prefixes: (List appropriate course prefixes. Core prefixes should be included.)*			

VII. New Course Request(s): Please complete a separate request form for each course.

Request for New Combined Course Library (CCL) Course

Name of College _____

Chief Academic Officer

(print or type) Last Name _____ First Name _____ MI _____

Chief Academic Officer

Signature _____ Date _____

Contact Person **Phone**

Rationale for New Course

Supporting Documentation (Complete all sections.)

Utilize the keyword search function located at http://www.nccommunitycolleges.edu/ccl.htm to locate similar courses.

List a current CCL course that is most similar to the requested course. Also list any other similar CCL course(s).	How Is New Course Significantly Different from the identified courses?
Colleges That Have Been Consulted	Response From Consulted College

Proposed Course Information

Three-Letter Prefix: _____ Three-Digit Number: _____

Short Title (30 characters including spaces) _____

Long Title (for clarification) _____

Hours: Classroom _____ Lab/Shop _____ Clinical _____ Work Experience _____ Total Credit _____

Prerequisite(s): _____ Corequisite(s): _____

Description:

A sentence summary of the course using a maximum of 40 words
(This course provides/introduces/covers/is designed to/includes...)

A sentence listing the major components of the course using a maximum of 40 words
(Topics include/Emphasis is placed on...)

A sentence listing the competencies of the course using a maximum of 50 words
(Upon completion, students should be able to ...)

REQUEST FOR NEW CCL COURSE

(page 2 of 2)

Student Learning Outcomes (SLOs): Student Learning Outcomes are not required.

□ Do Not Wish to Include SLOs

If included in the course request, SLOs should be concise, measurable and directly related to the course description. List SLOs for the new course if applicable. ***(Expand if needed.)***

1.
2.
3.
4.
5.
6.

Identify the curriculum(s) for which this course is intended:

Check the appropriate box to indicate the area where this new course will be offered:

General Education

☐ Communications

☐ Humanities/Fine Arts

☐ Mathematics

☐ Social/Behavioral Sciences

☐ Natural Sciences

Major Hours

☐ Core

☐ Concentration

☐ Other Major Hours

☐ Premajor/Elective (AA/AS/AFA only)

☐ Restrict to Major

☐ Restrict to Concentration

Other

Please specify _____

Identify all the credential levels for which this course is intended:

☐ AAS

☐ Diploma

☐ Certificate

☐ AA/AS/AFA*****

*******If approved by the Curriculum Review Committee (CRC), course will be forwarded to the Transfer Advisory Committee for consideration for transfer through the Comprehensive Articulation Agreement.*

VIII. Three Year Accountability Report: *The Three Year Accountability Report must be submitted three years <u>after</u> program implementation. Use the following template for the report.*

NCCCS New Curriculum Program Application Procedures
Template for
Three Year Accountability Report

Name of College:

_____

Title of Curriculum Program:_____

Date of State Board Approval:_____

Semester Program Started at College: Fall □ Spring □ Summer □ 20_ _

Number of Students Enrolled in Program Annually Since Implementation:
(Please break down by certificate/diploma/AAS level if applicable.)

First Year _____

Second Year _____

Third Year _____

Number of Program Completers by Year: *(Include additional years if applicable.)*

First Year	_____	Certificate_____	Diploma_____	AAS_____
Second Year	_____	Certificate_____	Diploma_____	AAS_____
Third Year	_____	Certificate_____	Diploma_____	AAS_____

Graduates Employment:

- Number and Percentage of Graduates Employed in Major or Related Field
  First Graduating Class: _____ _____%
  Second Graduating Class: _____ _____%

- Number and Percentage of Graduates Employed in Other Fields
  First Graduating Class: _____ _____%
  Second Graduating Class: _____ _____%

- Number and Percentage of Students Continuing Education
  _____ _____%

Program Outlook for Next Five Years (Brief Narrative)

Are there external accrediting or licensing requirements for this program?

Yes □ No □

If so, please provide date of accreditation/approval: _____ 20 _ _

or projected date of accreditation/approval: _____ 20 _ _

Attach minutes of local advisory committee meetings since program implementation.

Attach any other information pertaining to the program.

CURRICULUM STANDARD

Effective Term
Spring 2013
*[2013*01]*

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

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 23 NCAC 02E.0204 (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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(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. 23 NCAC 02E.0204 (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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

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			

Continued on next page

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.

Network Systems. Select one: NET 110 Networking Concepts 3 SHC NET 125 Networking Basics 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, CIS, COE, COM, CSC, CTI, CTS, DBA, ETR, GIS, GRO, HBI, HMT, ISC, LOG, MAT, MED, MKT, NET, NOS, OMT, OST, SEC, TNE, and WEB *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*			

CURRICULUM STANDARD

Effective Term
Spring 2013
*[2013*01]*

Curriculum Program Title: **Medical Dosimetry (Diploma)** Code: **D45450**

Concentration: **(not applicable)**

Curriculum Description

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

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

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

Admission criteria include the completion of a bachelors degree.

*Curriculum Requirements**

[for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204 (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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(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. 23 NCAC 02E.0204 (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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

Medical Dosimetry (Diploma) (D45450)

	AAS	Diploma	Certificate
Minimum Major Hours Required	**49 SHC**	**30 SHC**	**12 SHC**
A. CORE **Required Courses:** DOS 210 Introduction to Dosimetry 2 SHC DOS 220 Treatment Planning I 3 SHC DOS 221 Treatment Planning II 2 SHC DOS 230 Clinical Research Exper 2 SHC DOS 240 Clinical Education I 8 SHC DOS 241 Clinical Education II 8 SHC DOS 242 Clinical Education III 5 SHC DOS 243 Dosimetry Physics II 2 SHC DOS 250 Dose Calculations 2 SHC DOS 260 Brachytherapy Planning 3 SHC		**37 SHC**	
B. CONCENTRATION *(Not applicable)*			
C. OTHER MAJOR HOURS *To be selected from the following prefixes:* CIS, COE, CSC, CTS, DOS, RAD, and RTT *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*			

Approved by the State Board of Community Colleges on July 21, 2006; SBCC Revised 10/20/06; CRC Revised 03/21/07; SBCC Revised 09/21/07; SBCC Template Revised 10/17/08; CRC Revised – Electronic Only 02/10/11; SBCC Revised 01/20/12 ; SBCC Revised 08/16/12.

CURRICULUM STANDARD

Effective Term
Spring 2013
*[2013*01]*

Curriculum Program Title: **Positron Emission Tomography (Diploma)** Code: **D45820**

Concentration

Curriculum Description

The Positron Emission Tomography curriculum prepares individuals, working in conjunction with PET Technologist, to perform related PET radiopharmacy, procedures, and safety.

Students will acquire the knowledge and skills necessary to perform PET studies, including the use of PET/CT and PET/CT fusion. Past, present and future PET issues and studies will also be discussed.

Graduates may be eligible to take the registry examination given by the Nuclear Medicine Technology Certification Board. Employment opportunities can be found in hospitals, freestanding PET centers and mobile PET companies.

Admission criteria include the completion of a diploma in Nuclear Medicine, Radiology or Radiation Therapy.

*Curriculum Requirements**

[for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204 (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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(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**

Approved by the State Board of Community Colleges on April 21, 2006; SBCC Revised 09/21/07; SBCC Template Revised 10/17/08; SBCC Revised 08/16/12.

Major Hours

[ref. 23 NCAC 02E.0204 (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 experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

Positron Emission Tomography (Diploma) (D45820)

	AAS	Diploma	Certificate
Minimum Major Hours Required	**49 SHC**	**30 SHC**	**12 SHC**
A. CORE **Required Courses**: PET 112 PET Procedures 3 SHC PET 125 PET Radiopharmaceuticals 3 SHC PET 145 PET Physics 3 SHC PET 218 PET Protection 3 SHC PET 225 PET Instrumentation 3 SHC		**15 SHC**	
B. CONCENTRATION ***(Not applicable)***			
C. OTHER MAJOR HOURS *To be selected from the following prefixes:* CIS, COE, CSC, and PET *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*			

Curriculum Standard for Agribusiness: Agricultural Science Technology

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

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

Pathway: Agribusiness Systems

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Agribusiness Technology	CIP Code 01.0102	AAS/Diploma/Certificate	A15100
Sustainable Agriculture	CIP Code: 01.0308	AAS/Diploma/Certificate	A15410

Pathway Description:

These curriculum are designed to provide the entrepreneurial and technical skills necessary to manage a profitable, environmentally sound, community based small farm or agricultural business. The objective is the development of a workforce knowledgeable in sustainable agriculture practices.

Students will learn the fundamentals of agriculture, focusing on crop production and business. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs relating to agriculture.

Graduates should qualify for a variety of jobs in agricultural businesses such as equipment, feed, and agricultural supply sales; store management; farm operations; wholesale and retail produce management; nursery operations; and environmental and agricultural education.

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

Agribusiness Technology: A program that prepares individuals to manage agricultural businesses and agriculturally related operations within diversified corporations. Potential course work includes instruction in agriculture, agricultural specialization, business management, accounting, finance, marketing, planning, human resources management, and other managerial responsibilities.

Sustainable Agriculture: A program that focuses on agricultural principles and practices that, over the long term, enhance environmental quality, make efficient use of nonrenewable resources, integrate natural biological cycles and controls, and are economically viable and socially responsible; and that may prepare individuals to apply this knowledge to the solution of agricultural and environmental problems. Potential course work includes instruction in principles of agroecology, crop and soil sciences, entomology, horticulture, animal science, weed science and management, soil fertility and nutrient cycling, applied ecology, agricultural economics, and rangeland ecology and watershed management.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Agribusiness Systems: Agricultural Science Technology

Recommended 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.					
Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC		
COM	110	Introduction to Communication	3 SHC		
COM	120	Intro Interpersonal Com	3 SHC		
COM	231	Public Speaking	3 SHC		
*ENG	101	Applied Communications I	3 SHC		
*ENG	102	Applied Communications II	3 SHC		
ENG	110	Freshman Composition	3 SHC		
ENG	111	Expository Writing	3 SHC		
ENG	112	Argument-Based Research	3 SHC		
ENG	114	Prof Research & Reporting	3 SHC		
ENG	115	Oral Communication	3 SHC		
ENG	116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC		
HUM	110	Technology and Society	3 SHC		
HUM	115	Critical Thinking	3 SHC		
HUM	230	Leadership Development	3 SHC		
PHI	230	Introduction to Logic	3 SHC		
PHI	240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC		
ECO	251	Prin of Microeconomics	3 SHC		
GEO	110	Introduction to Geography	3 SHC		
GEO	111	World Regional Geography	3 SHC		
*PSY	101	Applied Psychology	3 SHC		
*PSY	102	Human Relations	2 SHC		
PSY	118	Interpersonal Psychology	3 SHC		
PSY	135	Group Processes	3 SHC		
PSY	150	General Psychology	3 SHC		
*SOC	105	Social Relationships	3 SHC		
SOC	210	Introduction to Sociology	3 SHC		
SOC	215	Group Processes	3 SHC		
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
BIO	140	Environmental Biology	3 SHC		
BIO	160	Introductory Life Science	3 SHC		
*MAT	101	Applied Mathematics I	3 SHC		
MAT	110	Mathematical Measurement	3 SHC		
MAT	115	Mathematical Models	3 SHC		
MAT	120	Geometry and Trigonometry	3 SHC		
MAT	121	Algebra/Trigonometry I	3 SHC		
MAT	140	Survey of Mathematics	3 SHC		
MAT	151	Statistics I	3 SHC		
MAT	155	Statistical Analysis	3 SHC		
PHY	110	Conceptual Physics	3 SHC		
PHY	121	Applied Physics I	4 SHC		

*Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Agribusiness Systems: Agricultural Science Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: #AGR 139 Intro to Sustainable Agriculture 3 SHC #AGR 170 Soil Science 3 SHC AGR 214 Agricultural Marketing 3 SHC ANS 110 Animal Science 3 SHC Co-op Experience. Choose one: #COE 111 Co-op Work Experience I 1 SHC COE 112 Co-op Work Experience I 2 SHC COE 113 Co-op Work Experience I 3 SHC Pesticides/Alternatives. Choose one: #AGR 121 Biological Pest Mgmt 3 SHC AGR 140 Agricultural Chemicals 3 SHC	**28-30 SHC**	**12-18 SHC**	
B. Program Major(s): **Agribusiness Technology** AGR 212 Farm Business and Management 3 SHC AGR 213 Ag Law & Finance 3 SHC *Select additional courses from the AGR prefix for a minimum of 12 SHC for the Agribusiness Technology AAS program.* *An Agribusiness Technology diploma requires a minimum of 12 SHC extracted from the required technical/program major core of the AAS degree.* **Sustainable Agriculture** #AGR 111 Basic Farm Maintenance 2 SHC #AGR 160 Plant Science 3 SHC #AGR 265 Organic Crop Prod: Spring 3 SHC *Select additional courses from the AGR prefix for a minimum of 12 SHC for the Sustainable Agriculture AAS program.* *Courses required for the Sustainable Agriculture Diploma are designated with #*			

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

ACC, ACM, AGR, ANS, BIO, BTC, BUS, CHM, CIS, COE, CSC, DFT, ECO, ETR, FOR, GCM, GIS, HET, HOR, IVS, LAR, LSG, PED, PSY, SEL,TRF, VEN, WLD, and ZAS

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Animal Systems: Animal Care Management Technology	
Career Cluster: Agriculture, Food, and Natural Resources **	
Cluster Description: The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fuel, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.	
Pathway: Animal Systems	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Animal Care and Management Technology	CIP Code: 01.0599	AAS/Diploma/Certificate	A55100

Pathway Description:

The Animal Care and Management Technology curriculum is designed to provide students with the opportunity to acquire the skills, knowledge, and attitudes necessary for employment in the animal care industry.

Course work includes instruction designed to educate students in the basic sciences pertinent to animal work including legal aspects, basic management skills needed to work with both people and animals, and hands-on skills necessary for safety and health.

Graduates should qualify for opportunities with humane organizations, kennels, city and county animal control agencies, animal shelters, zoos, residency facilities, and veterinarians.

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

Animal Care and Management Technology: A program that focuses on feeding, watering, grooming, bathing, exercising, or otherwise care for pets and agricultural animals, dogs, cats, or birds, zoo animals, and mice. Graduates may work in settings such as kennels, animal shelters, zoos and circuses. Potential coursework includes courses in keeping records of feedings, treatments, animals received or discharged, and cleaning, disinfecting, and repairing cages and pens.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Animal Systems: Animal Care Management Technology

Recommended 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 not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Animal Systems: Animal Care Management Technology		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:		**25 SHC**		
ACM 110 Intro to Animal Care	3 SHC			
ACM 111 Health Care for Animals	3 SHC			
ACM 112 Facility Management	3 SHC			
ACM 113 Animal Handling	3 SHC			
B. Program Major(s):				
Animal Care Management				
ACM 210 Law Pertaining to Animals	4 SHC			
ACM 211 Applied Animal Behavior	3 SHC			
ACM 212 Community Health	3 SHC			
ACM 213 Euthanasia	3 SHC			

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

ACM, ANS, BIO, BUS, CIS, CJC, COE, CSC, POL, PSY, AND VET.

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Animal Systems: Applied Animal Science Technology

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

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

Pathway: Animal Systems | **Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Applied Animal Science Technology	CIP Code 01.0302	AAS/Diploma/Certificate	A15280
Poultry Management Technology	CIP Code 01.0907	AAS/Diploma/Certificate	A15XXX
Swine Management Technology	CIP Code: 01.0906	AAS/Diploma/Certificate	A1528X

Pathway Description:

This curriculum is designed to prepare students for careers in the production, processing, and distribution of livestock, swine, and poultry and their products according to scientific principles essential to efficient and profitable operation.

Students should learn skills necessary for the operation of efficient and profitable livestock, swine, and poultry enterprises. Coursework includes production practices, animal health, nutrition, reproduction, and management.

Graduates should qualify for entry-level jobs as herd or flock managers, field service persons, feed salespersons, equipment salespersons, feed mill workers, buyers of poultry and livestock, owners/operators, farm managers, department supervisors, field service representatives, and waste management technicians.

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

Applied Animal Science Technology: A program that prepares individuals to select, breed, care for, process, and market livestock and small farm animals. Potential course work includes instruction in basic animal science**,** animal nutrition, and animal health as applied to various species and breeds; design and operation of housing, feeding, and processing facilities; and related issues of safety, applicable regulations, logistics, and supply.

Poultry Management Technology: A program that focuses on the application of biological and chemical principles to the production and management of poultry animals and the production and handling of poultry products. Potential course work includes instruction in avian sciences, nutrition sciences, food science and technology, biochemistry, hatchery design, and related aspects of human and animal health and safety.

Swine Management Technology: A program that focuses on the application of biological and chemical principles to the production and management of swine animals and the production and handling of meat and other products. Potential course work includes instruction in animal sciences, range science, nutrition sciences, food science and technology, biochemistry, and related aspects of human and animal health and safety.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Animal Systems: Applied Animal Science Technology

Recommended 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 not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Animal Systems: Applied Animal Science		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:		**24 SHC**	**6-18 SHC**	
*ANS 110 Animal Science	3 SHC			
*ANS 115 Animal Feeds and Nutrition	3 SHC			
*ANS 120 Beef Production	3 SHC			
*ANS 130 Poultry Production	3 SHC			
B. Program Major(s):				
Applied Animal Science				
*ANS 140 Swine Production	3 SHC			
*ANS 150 Animal Health Management	3 SHC			
Select additional courses from the ANS prefix for a minimum of 12 SHC for the Applied Animal Science AAS program.				
*Courses required for the Applied Animal Science diploma are designated with *****				
Poultry Management				
ANS 230 Poultry Management	3 SHC			
# ANS 232 Meatbird Production	3 SHC			
# ANS 234 Egg Production	3 SHC			
Select additional courses from the ANS prefix for a minimum of 12 SHC for the Poultry Management AAS program.				
Courses required for the Poultry Management diploma are designated with #				
Swine Management				
Choose a minimum of 12 SHC from the following courses for the Swine Management AAS program:				
+ ANS142 Swine Records and Analysis	3 SHC			
+ ANS143 Swine Health Management	3 SHC			
+ ANS144 Swine Housing & Waste Mgt	4 SHC			
+ ANS240 Swine Prod Issues	2 SHC			
BUS137 Principles of Management	3 SHC *or*			
BUS153 Human Resource Management	3 SHC			
COE113 Co-op Work Experience I	3 SHC			
Courses required for the Swine Management diploma are designated with +				

C. Other Major Hours.

T*o be selected from the following prefixes:*

ACM, AGR, ANS, BUS, CIS, COE, CSC, ETR, GIS, and WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Animal Systems: Aquaculture Technology

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

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

Pathway: Animal Systems

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

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

Pathway Description:

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

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

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

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

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

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Animal Systems: Aquaculture Technology

Recommended 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. **Communication:**		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC		
COM 110	Introduction to Communication	3 SHC		
COM 120	Intro Interpersonal Com	3 SHC		
COM 231	Public Speaking	3 SHC		
*ENG 101	Applied Communications I	3 SHC		
*ENG 102	Applied Communications II	3 SHC		
ENG 110	Freshman Composition	3 SHC		
ENG 111	Expository Writing	3 SHC		
ENG 112	Argument-Based Research	3 SHC		
ENG 114	Prof Research & Reporting	3 SHC		
ENG 115	Oral Communication	3 SHC		
ENG 116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
ART 111	Art Appreciation	3 SHC		
*HUM 101	Values in the Workplace	2 SHC		
HUM 110	Technology and Society	3 SHC		
HUM 115	Critical Thinking	3 SHC		
HUM 230	Leadership Development	3 SHC		
PHI 230	Introduction to Logic	3 SHC		
PHI 240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC		
ECO 251	Prin of Microeconomics	3 SHC		
GEO 111	World Regional Geography	3 SHC		
*PSY 101	Applied Psychology	3 SHC		
*PSY 102	Human Relations	2 SHC		
PSY 118	Interpersonal Psychology	3 SHC		
PSY 135	Group Processes	3 SHC		
PSY 150	General Psychology	3 SHC		
*SOC 105	Social Relationships	3 SHC		
SOC 210	Introduction to Sociology	3 SHC		
SOC 215	Group Processes	3 SHC		
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140	Environmental Biology	3 SHC		
BIO 160	Introductory Life Science	3 SHC		
*MAT 101	Applied Mathematics I	3 SHC		
MAT 110	Mathematical Measurement	3 SHC		
MAT 115	Mathematical Models	3 SHC		
MAT 120	Geometry and Trigonometry	3 SHC		
MAT 121	Algebra/Trigonometry I	3 SHC		
MAT 140	Survey of Mathematics	3 SHC		
MAT 151	Statistics I	3 SHC		
MAT 155	Statistical Analysis	3 SHC		
MAT 171	Precalculus Algebra	3 SHC		
PHY 110	Conceptual Physics	3 SHC		
PHY 121	Applied Physics I	4 SHC		

**Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.*

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Animal Systems: Aquaculture Technology		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:				
*AQU 111 Aquaculture I	3 SHC	**26-27 SHC**	**25-27 SHC**	
*AQU 220 Aquaculture Facilities	3 SHC			
*BIO 111 General Biology I	4 SHC			
*CHM 151 General Chemistry I	4 SHC			
B. Program Major(s):				
Aquaculture Technology				
*Culture Techniques. Choose one.				
AQU 112 Aquaculture II	3 SHC			
AQU 260 Aquariology	3 SHC			
* Business. Choose one:				
AQU 120 Aquabusiness	3 SHC			
BUS 110 Introduction to Business	3 SHC			
BUS 280 REAL Small Business	4 SHC			
* Culture Environment. Choose one:				
AQU 210 Limnology & Water Quality	3 SHC			
AQU 270 Water Gardens	3 SHC			
BIO 243 Marine Biology	4 SHC			
FWL 234 Aquatic Ecology	3 SHC			
Other. Choose one:				
AQU 280 Aquaculture Project	2 SHC			
COE 112 Co-op Work Experience I	2 SHC			
Select additional courses from the AQU, BIO, BUS, or FWL prefix for a minimum of 12 SHC for the Aquaculture Technology AAS program.				
*Courses required for the Aquaculture Technology Diploma are designated with * *				

C. Other Major Hours.

To be selected from the following prefixes:

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

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Animal Systems: Equine Science Technology

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

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

Pathway: Animal Systems

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Equine Business Technology	CIP Code 01.0307	AAS/Diploma/Certificate	A15XXX
Equine Training Technology	CIP Code 01.0507	AAS/Diploma/Certificate	A15XXX

Pathway Description:

This curriculum is designed to prepare students for positions within the horse industry. The curriculum is management oriented, preparing graduates for the widest range of available equine jobs; areas of specialization may be pursued during the internship.

Course work includes farm management, breeding, nutrition, selection/judging, and health. Training, teaching, and riding are also included. Students are assigned a horse and practice day-to-day management at an equine facility.

Graduates should qualify for jobs with many different types of equine operations: grooms to assistant managers; private to recreational and racing barns; breed to discipline-oriented farms.

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

Equine Business Technology: A program that prepares individuals to manage the selection, breeding, care, and maintenance of work, athletic, and show horses; and to manage horse farms, stables, tracks and related equipment and operations. Potential course work includes instruction in applicable principles of animal science, care, and health; stable and track management; design and operation of facilities and equipment; and related issues such as regulations, business management; and logistics.

Equine Training Technology: A program that focuses on the horse, horsemanship, and related subjects and prepares individuals to care for horses and horse equipment; ride and drive horses for leisure, sport, show, and professional purposes; and manage the training of horses and riders. Potential course work includes instruction in horse breeding, nutrition, health, and safety; history of the horse and horsemanship; horse development and training; riding and equestrian technique; stable, paddock, and track management; and equipment maintenance and repair.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Animal Systems: Equine Science Technology

Recommended 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 not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC		
COM 110	Introduction to Communication	3 SHC		
COM 120	Intro Interpersonal Com	3 SHC		
COM 231	Public Speaking	3 SHC		
*ENG 101	Applied Communications I	3 SHC		
*ENG 102	Applied Communications II	3 SHC		
ENG 110	Freshman Composition	3 SHC		
ENG 111	Expository Writing	3 SHC		
ENG 112	Argument-Based Research	3 SHC		
ENG 114	Prof Research & Reporting	3 SHC		
ENG 115	Oral Communication	3 SHC		
ENG 116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC		
HUM 110	Technology and Society	3 SHC		
HUM 115	Critical Thinking	3 SHC		
HUM 230	Leadership Development	3 SHC		
PHI 230	Introduction to Logic	3 SHC		
PHI 240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC		
ECO 251	Prin of Microeconomics	3 SHC		
GEO 110	Introduction to Geography	3 SHC		
GEO 111	World Regional Geography	3 SHC		
*PSY 101	Applied Psychology	3 SHC		
*PSY 102	Human Relations	2 SHC		
PSY 118	Interpersonal Psychology	3 SHC		
PSY 135	Group Processes	3 SHC		
PSY 150	General Psychology	3 SHC		
*SOC 105	Social Relationships	3 SHC		
SOC 210	Introduction to Sociology	3 SHC		
SOC 215	Group Processes	3 SHC		
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140	Environmental Biology	3 SHC		
BIO 160	Introductory Life Science	3 SHC		
*MAT 101	Applied Mathematics I	3 SHC		
MAT 110	Mathematical Measurement	3 SHC		
MAT 115	Mathematical Models	3 SHC		
MAT 120	Geometry and Trigonometry	3 SHC		
MAT 121	Algebra/Trigonometry I	3 SHC		
MAT 140	Survey of Mathematics	3 SHC		
MAT 151	Statistics I	3 SHC		
MAT 155	Statistical Analysis	3 SHC		
PHY 110	Conceptual Physics	3 SHC		
PHY 121	Applied Physics I	4 SHC		

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core or other Major Areas.

Animal Systems: Equine Science	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: *Courses required for the Equine Technology Diploma are designated with ** *EQU 111 Horse Science I 5 SHC *EQU 112 Horse Science II 5 SHC EQU 120 Horsemanship I 3 SHC *EQU 150 Equine Nutrition 2 SHC EQU 211 Horse Farm Management I 6 SHC EQU 212 Horse Farm Management II 6 SHC EQU 241 Equine Reproduction 4 SHC EQU 270 Equine Business Law 1 SHC	**42-44 SHC**	**12 SHC**	
B. Program Major(s): **Equine Business** BUS 135 Principles of Supervision 3 SHC BUS 230 Small Business Management 3 SHC EQU 270 Equine Business Law 1 SHC Management/Marketing. Choose one: BUS 137 Principles of Management 3 SHC MKT 120 Principles of Marketing 3 SHC *Select additional courses from the BUS, EQU, or MKT prefix for a minimum of 12 SHC for the Equine Business AAS program.* **Equine Training** EQU 121 Horsemanship II 2 SHC EQU 220 Horse Training I 2 SHC EQU 221 Horse Training II 2 SHC EQU 260 Basic Colt Training 2 SHC *Select additional courses from the EQU prefix for a minimum of 12 SHC for the Equine Training AAS program.*			

C. Other Major Hours.

T*o be selected from the following prefixes:*

AGR, ANS, BUS, CIS, COE, CSC, ETR, EQU, MKT

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Natural Resources Technology

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

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

Pathway: Natural Resource Systems

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Fish and Wildlife Management Technology	CIP Code: 03.0601	AAS/Diploma/Certificate	A15160
Forestry Management Technology	CIP Code 03.0511	AAS/Diploma/Certificate	A15200

Pathway Description:

The Natural Resources System curriculum is designed to provide the practice and academic skills essential for success in Natural Resource Management.

Students will gain an understanding of the principles and develop competencies and technical skills in the production, utilization and conservation of natural resources. Students will also learn many technical and conservation skills.

Graduates qualify for positions in natural resources technician positions in a wide range of outdoor national venues.

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

Fish and Wildlife Management Technology: A program that prepares individuals to conserve and manage wilderness areas and the life therein, and manage wildlife reservations and zoological/aquarium facilities for recreational, commercial, and ecological purposes. Potential course work includes instruction in wildlife biology, marine/aquatic biology, environmental science, freshwater and saltwater ecosystems, natural resources management and policy, outdoor recreation and parks management, the design and operation of natural and artificial wildlife habitats, applicable law and regulations, and related administrative and communications skills.

Forestry Management Technology: A program that prepares individuals to manage and produce forest resources. Potential course work includes instruction in woods and field skills, tree identification, timber measurement, logging and timber harvesting, forest propagation and regeneration, forest fire-fighting, resource management, equipment operation and maintenance, record-keeping, sales and purchasing operations, and personnel supervision.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Natural Resources Technology

Recommended 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 not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC		
COM 110	Introduction to Communication	3 SHC		
COM 120	Intro Interpersonal Com	3 SHC		
COM 231	Public Speaking	3 SHC		
*ENG 101	Applied Communications I	3 SHC		
*ENG 102	Applied Communications II	3 SHC		
ENG 110	Freshman Composition	3 SHC		
ENG 111	Expository Writing	3 SHC		
ENG 112	Argument-Based Research	3 SHC		
ENG 114	Prof Research & Reporting	3 SHC		
ENG 115	Oral Communication	3 SHC		
ENG 116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC		
HUM 110	Technology and Society	3 SHC		
HUM 115	Critical Thinking	3 SHC		
HUM 230	Leadership Development	3 SHC		
PHI 230	Introduction to Logic	3 SHC		
PHI 240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC		
ECO 251	Prin of Microeconomics	3 SHC		
GEO 110	Introduction to Geography	3 SHC		
GEO 111	World Regional Geography	3 SHC		
*PSY 101	Applied Psychology	3 SHC		
*PSY 102	Human Relations	2 SHC		
PSY 118	Interpersonal Psychology	3 SHC		
PSY 135	Group Processes	3 SHC		
PSY 150	General Psychology	3 SHC		
*SOC 105	Social Relationships	3 SHC		
SOC 210	Introduction to Sociology	3 SHC		
SOC 215	Group Processes	3 SHC		
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140	Environmental Biology	3 SHC		
BIO 160	Introductory Life Science	3 SHC		
*MAT 101	Applied Mathematics I	3 SHC		
MAT 110	Mathematical Measurement	3 SHC		
MAT 115	Mathematical Models	3 SHC		
MAT 120	Geometry and Trigonometry	3 SHC		
MAT 121	Algebra/Trigonometry I	3 SHC		
MAT 140	Survey of Mathematics	3 SHC		
MAT 151	Statistics I	3 SHC		
MAT 155	Statistical Analysis	3 SHC		
PHY 110	Conceptual Physics	3 SHC		
PHY 121	Applied Physics I	4 SHC		

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Natural Resources Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**25-28 SHC**	**12-14 SHC**	
FOR 121 Dendrology 4 SHC			
FOR 131 Forest Measurements 3 SHC			
FOR 212 Forest Survey & Aerial Interp 3 SHC			
GIS/GPS. Choose one.			
FOR 215 Intro to GIS/GPS 3 SHC			
or			
GIS 111 Introduction to GIS 3 SHC *and*			
GIS 112 Introduction to GPS 3 SHC			
B. Program Major(s):			
Fish and Wildlife Management Technology			
Select a minimum of 12 SHC from the following courses for the Fish and Wildlife Management Technology AAS program:			
# Maintenance. Select one:			
FWL 252 Wildlife Mgmt Techniques 3 SHC *or*			
REC 217 Maintenance/Facility Mgt 3 SHC			
#FOR 242 Fishery Management 3 SHC			
#FWL 126 Wildlife Ornithology 3 SHC			
#FWL 142 Wildlife Management 3 SHC			
#FWL 212 Wildlife Policy & Law 2 SHC			
FWL 222 Wildlife Mammalogy 3 SHC			
Courses required for the Fish and Wildlife Management Technology diploma are designated with #			
Forest Management Technology			
FOR 171 Introduction to Forest Resources 3 SHC			
FOR 232 Forest Mensuration 4 SHC			
Select additional courses from the FOR prefix for a minimum of 12 SHC for the Forest Management Technology AAS program.			
A Forest Management Technology diploma requires a minimum of 12 SHC extracted from the required technical/program major core of the AAS degree.			

C. Other Major Hours.

To be selected from the following prefixes:

ACC, AGR, ANS, ARC, BIO, BTC, BUS, CHM, CIS, COE, CSC, CST, CUL, DFT, ECO, ETR, FOR, GCM, GIS, HET, HOR, IVS, LAR, LID, LSG, SEL, SST, TRF and VEN

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Natural Resource Systems: Marine Technology

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

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

Pathway: Natural Resource Systems | **Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

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

Pathway Description:

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

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

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

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

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

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

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Natural Resource Systems: Marine Technology

Recommended General Education Academic Core		AAS	Diploma	Certificate
Minimum General Education Hours Required:		**15 SHC**	**6 SHC**	**0 SHC**
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 not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Natural Resource Systems: Marine	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**35 SHC**	**12- 32 SHC**	
*MSC 122 Boat Handling/Seamanship 3 SHC			
*MSC 124 Industrial Skills 3 SHC			
*MSC 132 Fishing Gear Tech I 3 SHC			
*MSC 150 Marine Navigation 3 SHC			
*MSC 160 Oceanography 4 SHC			
MSC 180 Water Analysis 3 SHC			
MSC 276 Marine Vertebrate Zoo 4 SHC			
B. Program Major(s):			
Marine Science			
Select a minimum of 12 SHC from the following courses for the Marine Science AAS program:			
BIO 111 General Biology I 4 SHC			
BIO 146 Regional Natural History 4 SHC			
BIO 243 Marine Biology 4 SHC			
Ecology. Select 4-7 SHC:			
BIO 145 Ecology 4 SHC *or*			
ENV 110 Environmental Science 3 SHC *and*			
ENV 220 Applied Ecology 4 SHC			
Select a minimum of 12 SHC from technical core or program major courses for a diploma in Marine Science.			
Marine Technology			
Select a minimum of 12 SHC from the following courses for the Marine Technology AAS program:			
*MSC 110 Training Cruise I 1 SHC			
*MSC 112 Training Cruise II 1 SHC			
*MSC 114 Training Cruise III 1 SHC			
*MSC 126 Marine Engines 2 SHC			
*MSC 134 Fishing Gear Technology II 2 SHC			
*MSC 152 Marine Instrumentation 2 SHC			
*MSC 172 Marine Biology 3 SHC			
*MSC 174 Marine Invertebrate Zoo 4 SHC			
*Courses required for the Marine Technology diploma are designated with **			

C. Other Major Hours.

To be selected from the following prefixes:

AGR, AQU, BIO, BUS, CHM, CIS, COE, CSC, DFT, ELN, ETR. ENV, HEA, FOR, FWL, GIS, HOR, REC, TRF, MAT, MSC, PED, PHO, PHY, REC, TXY, VEN, WLD, WPP and ZAS

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Plant Systems: Horticultural Science Technology

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

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

Pathway: Plant Systems | **Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Golf Course Management Technology	CIP Code 31.0302	AAS/Diploma/Certificate	A15XXX
Horticultural Technology	CIP Code: 01.0601	AAS/Diploma/Certificate	A15240
Landscape Gardening	CIP Code 01.0605	AAS/Diploma/Certificate	A15260
Turfgrass Management Technology	CIP Code: 01.0607	AAS/Diploma/Certificate	A15420

Pathway Description:

These curricula are designed to prepare individuals for various careers in horticulture. Classroom instruction and practical laboratory applications of horticultural principles and practices are included in the program of study.

Course work includes plant identification, pest management, plant science and soil science. Also included are courses in sustainable plant production and management, landscaping, and the operation of horticulture businesses.

Graduates should qualify for employment in a variety of positions associated with nurseries, garden centers, greenhouses, landscape operations, governmental agencies/parks, golf courses, sports complexes, highway vegetation, turf maintenance companies, and private and public gardens. Graduates should also be prepared to take the North Carolina Pesticide Applicator's Examination and/or the North Carolina Certified Plant Professional Examination.

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

Golf Course Management Technology: A program that prepares individuals to manage the operation of golf courses. Potential course work includes instruction in turf grass science and management, golf course design and construction, grounds equipment and operation, pest control, and grounds management.

Horticultural Science Technology: A program that focuses on the general production and management of cultivated plants, shrubs, flowers, foliage, trees, groundcovers, and related plant materials; the management of technical and business operations connected with horticultural services; and the basic scientific principles needed to understand plants and their management and care.

Landscape Gardening: A program that prepares individuals to manage and maintain indoor and/or outdoor ornamental and recreational plants and groundcovers and related conceptual designs established by landscape architects, interior designers, enterprise owners or managers, and individual clients. Potential course work includes instruction in applicable principles of horticulture, gardening, plant and soil irrigation and nutrition, turf maintenance, plant maintenance, equipment operation and maintenance, personnel supervision, and purchasing.

Turfgrass Management Technology: A program that focuses on turfgrasses and related groundcover plants and prepares individuals to develop ornamental or recreational grasses and related products; plant, transplant, and manage grassed areas; and to produce and store turf used for transplantation. Potential course work includes instruction in applicable plant sciences, genetics of grasses, turf science, use analysis, turf management, and related economics.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Plant Systems: Horticultural Science Technology

Recommended 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 not be included in associate degree programs.*

Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC		
COM	110	Introduction to Communication	3 SHC		
COM	120	Intro Interpersonal Com	3 SHC		
COM	231	Public Speaking	3 SHC		
*ENG	101	Applied Communications I	3 SHC		
*ENG	102	Applied Communications II	3 SHC		
ENG	110	Freshman Composition	3 SHC		
ENG	111	Expository Writing	3 SHC		
ENG	112	Argument-Based Research	3 SHC		
ENG	114	Prof Research & Reporting	3 SHC		
ENG	115	Oral Communication	3 SHC		
ENG	116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC		
HUM	110	Technology and Society	3 SHC		
HUM	115	Critical Thinking	3 SHC		
HUM	230	Leadership Development	3 SHC		
PHI	230	Introduction to Logic	3 SHC		
PHI	240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC		
ECO	251	Prin of Microeconomics	3 SHC		
GEO	110	Introduction to Geography	3 SHC		
GEO	111	World Regional Geography	3 SHC		
*PSY	101	Applied Psychology	3 SHC		
*PSY	102	Human Relations	2 SHC		
PSY	118	Interpersonal Psychology	3 SHC		
PSY	135	Group Processes	3 SHC		
PSY	150	General Psychology	3 SHC		
*SOC	105	Social Relationships	3 SHC		
SOC	210	Introduction to Sociology	3 SHC		
SOC	215	Group Processes	3 SHC		
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
BIO	140	Environmental Biology	3 SHC		
BIO	160	Introductory Life Science	3 SHC		
*MAT	101	Applied Mathematics I	3 SHC		
MAT	110	Mathematical Measurement	3 SHC		
MAT	115	Mathematical Models	3 SHC		
MAT	120	Geometry and Trigonometry	3 SHC		
MAT	121	Algebra/Trigonometry I	3 SHC		
MAT	140	Survey of Mathematics	3 SHC		
MAT	151	Statistics I	3 SHC		
MAT	155	Statistical Analysis	3 SHC		
PHY	110	Conceptual Physics	3 SHC		
PHY	121	Applied Physics I	4 SHC		

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core or other Major Areas.

Plant Systems: Horticultural Science	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:			
Plant Identification. Choose one:	**23-26 SHC**	**9-12 SHC**	
HOR 160 Plant Materials I 3 SHC			
TRF 110 Intro Turfgrass Cult & ID 4 SHC			
Pest Management. Choose one:			
HOR 164 Hort Pest Mgmt 3 SHC			
TRF 240 Turfgrass Pest Control 3 SHC			
Design. Choose one.			
HOR 112 Landscape Design I 3 SHC			
^TRF 120 Turf Irrigat & Design 4 SHC			
TRF 151 Intro Landscape Design 3 SHC			
Soil Science. Choose one.			
AGR 170 Soil Science 3 SHC			
HOR 166 Soils and Fertilizers 3 SHC			
LSG 111 Basic Landscape Technique 2 SHC			
B. Program Major(s):			
Golf Course Management			
#GCM 220 Golf Course Maint Systems 3 SHC			
#GCM 230 Golf Course Org and Admin 3 SHC			
#GCM 240 Golf Course Design 3 SHC			
Select additional courses from the GCM prefix for a minimum of 12 SHC for the Golf Course Management AAS program.			
Courses required for the Golf Course Management Diploma are designated with #			

B. Program Major(s)(Continued)

Horticultural Science

HOR 162	Applied Plant Science	3 SHC
HOR 168	Plant Propagation	3 SHC

Operations. Choose one:

HOR 124	Nursery Operations	3 SHC
HOR 134	Greenhouse Operations	3 SHC
LSG 121	Fall Gardening Lab	2 SHC

Select additional courses from the HOR or LSG prefix for a minimum of 12 SHC for the Horticultural Science AAS program.

A Horticultural Science Technology diploma requires a minimum of 12 SHC extracted from the required technical/program major core of the AAS degree.

Landscape Gardening

Select a minimum of 12 SHC from the following courses for the Landscape Gardening AAS program:

COE 111	Co-op Work Experience I	1 SHC
+HOR 114	Landscape Construction	3 SHC
+HOR 134	Greenhouse Operations	3 SHC
+LSG 111	Basic Landscape Technique	2 SHC
+LSG 121	Fall Gardening Lab	2 SHC
+LSG 122	Spring Gardening Lab	2 SHC
LSG 123	Summer Gardening Lab	2 SHC
LSG 231	Landscape Supervision	4 SHC

Courses required for the Landscape Gardening Diploma are designated with +

Turfgrass Management

TRF 152	Landscape Maintenance	3 SHC
^TRF 210	Turfgrass Eqmt Mgmt	3 SHC
^TRF 230	Turfgrass Mgmt Apps	2 SHC
TRF 260	Adv Turfgrass Mgmt	4 SHC

Courses required for the Turfgrass Management Diploma are designated with ^

C. Other Major Hours.

T*o be selected from the following prefixes:*

ACC, AGR, ANS, ARC, BIO, BTC, BUS, CHM, CIS, COE, CSC, CST, CUL, DFT, ECO, ETR, FOR, FWL, GCM, GIS, HET, HOR, IVS, LAR, LID, LSG, SEL, SST, TRF and VEN

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Plant Systems: Viticulture and Enology Technology

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

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

Pathway: Plant Systems	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Viticulture and Enology Technology	CIP Code 01.0309	AAS/Diploma/Certificate	A15430

Pathway Description:

This curriculum is designed to prepare individuals for various careers in the grape growing and wine making industry. Classroom instruction, practical laboratory applications of viticulture/enology principles and practices are included in the program of study.

Course work in viticulture includes aspects of plant science, vineyard stock selection and propagation, soils, vine nutrition and pest management, planning, layout, economics and management of vineyards. Those interested in enology will receive training in the classroom, laboratory and field in the tools and techniques of wine making. Related courses in microbiology and fermentation science, sensory analysis, winery economics and marketing are offered.

Graduates should qualify for employment opportunities in vineyards, wineries, garden centers, greenhouses, related sales areas and government agencies. Graduates should also be prepared to take the North Carolina Pesticide Applicators Examination and the North Carolina Certified Plant Professional Examination.

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

Viticulture and EnologyTechnology: A program that focuses on the application of scientific and agribusiness principles to the production of grapes, the making of wine, and the wine business. Potential course work includes instruction in grapes and wines of the world; grape production; winemaking technology; plant biology; chemistry; food science, safety, and packaging; soil science; pest management; and marketing and business management.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Plant Systems: Viticulture and Enology Technology

Recommended 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.				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

**Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.*

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Plant Systems: Viticulture and Enology Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: *VEN 133 Intro to Winemaking 3 SHC *VEN 135 Intro to Viticulture 4 SHC *VEN 138 Vineyard Estab & Dev 3 SHC *VEN 238 Grape Pests/Disea/Disorde 3 SHC	**25 SHC**	**13 SHC**	
B. Program Major(s): **Viticulture and Enology** VEN 132 Wines of the World 2 SHC *Select additional courses from the VEN prefix for a minimum of 12 SHC for the Viticulture and Enology AAS program.* *Courses required for the Viticulture and Enology Diploma are designated with **			
C. Other Major Hours. **T*o be selected from the following prefixes:*** AGR, BUS, CIS, COE, CSC, ETR, HOR, VEN, and WLD *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*			

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.

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

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

Curriculum Standard for Air Conditioning, Heating, and Refrigeration Technology

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway:

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Air Conditioning, Heating, and Refrigeration Technology	CIP Code 47.0201	AAS/Diploma/Certificate	A35100

Pathway Description:

The Air Conditioning, Heating, and Refrigeration Technology curriculum provides the basic knowledge to develop skills necessary to work with residential and light commercial systems.

Topics include mechanical refrigeration, heating and cooling theory, electricity, controls, and safety. The diploma program covers air conditioning, furnaces, heat pumps, tools and instruments. In addition, the AAS degree covers residential building codes, residential system sizing, and advanced comfort systems.

Diploma graduates should be able to assist in the start up, preventive maintenance, service, repair, and/or installation of residential and light commercial systems. AAS degree graduates should be able to demonstrate an understanding of system selection and balance and advanced systems.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Air Conditioning, Heating, and Refrigeration Technology

Recommended 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.				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC		
COM 110	Introduction to Communications	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	Prof Research & Reporting	3 SHC		
ENG 116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC		
HUM 110	Technology and Society	3 SHC		
HUM 115	Critical Thinking	3 SHC		
HUM 230	Leadership Development	3 SHC		
PHI 230	Introduction to Logic	3 SHC		
PHI 240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC		
ECO 251	Prin of Microeconomics	3 SHC		
*PSY 101	Applied Psychology	3 SHC		
*PSY 102	Human Relations	2 SHC		
PSY 118	Interpersonal Psychology	3 SHC		
PSY 135	Group Processes	3 SHC		
PSY 150	General Psychology	3 SHC		
*SOC 105	Social Relationships	3 SHC		
SOC 210	Introduction to Sociology	3 SHC		
SOC 215	Group Process	3 SHC		
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
*MAT 101	Applied Mathematics I	3 SHC		
MAT 110	Mathematical Measurements	3 SHC		
MAT 115	Mathematical Models	3 SHC		
MAT 120	Geometry and Trigonometry	3 SHC		
MAT 121	Algebra/Trigonometry	3 SHC		
PHY 110	Conceptual Physics	3 SHC		
PHY 121	Applied Physics I	4 SHC		

Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Air Conditioning, Heating, and Refrigeration Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: *Courses required for the diploma are designated with **	**32-34 SHC**	**20-22 SHC**	
Required Courses:			
* AHR 110 Intro to Refrigeration	5 SHC		
* AHR 112 Heating Technology	4 SHC		
* AHR 113 Comfort Cooling	4 SHC		
* AHR 114 Heat Pump Technology	4 SHC		
*** Electricity. Select one:**			
AHR 111 HVACR Electricity	3 SHC		
ELC 111 Intro to Electricity	3 SHC		
ELC 112 DC/AC Electricity	5 SHC		
Required Subject Areas. Select one. *For AAS degree, select one subject area plus additional courses from the prefixes listing within the same subject area for a minimum of (12) semester hours of credit:*			
Air Conditioning, Heating, & Refrigeration			
AHR 211 Residential System Design	3 SHC		
AHR 212 Advanced Comfort Systems	4 SHC		
AHR 213 HVACR Building Code	2 SHC		
Solar Thermal Systems			
AHR 240 Hydronic Heating	2 SHC		
ALT 250 Thermal Systems	3 SHC		
PLU 111 Intro to Basic Plumbing	2 SHC		
B. Program Major(s): Not Applicable			

C. Other Major Hours: ***To be selected from the following prefixes:***
AHR and no more than 21 SHC selected from ALT, BPR, BUS, CIS, COE, CSC, CST, EGR, ELC, ELN, EUS, HYD, ISC, MAT, PHY, PLU, REF, SST, WLD and WOL
Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Construction: Architecture & Construction Technology

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction | **Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Architectural Technology	CIP Code 15.0101	AAS/Diploma/Certificate	A40100
Building Construction Technology	CIP Code: 46.0499	AAS/Diploma/Certificate	A35140
Carpentry	CIP Code: 46.0201	Diploma/Certificate	D35180
Construction Management Technology	CIP Code 46.0401	AAS/Diploma/Certificate	A35190
Masonry	CIP Code: 46.0101	Diploma/Certificate	D35280
Plumbing	CIP Code: 46.0503	Diploma/Certificate	D35300

Pathway Description:

These curriculums are designed to prepare individuals to apply technical knowledge and skills to the fields of architecture, construction, construction management, and other associated professions.

Course work includes instruction in sustainable building and design, print reading, building codes, estimating, construction materials and methods, and other topics related to design and construction occupations.

Graduates of this pathway should qualify for entry-level jobs in architectural, engineering, construction and trades professions as well as positions in industry and government.

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:***

Architectural Technology:
A program that prepares individuals to assist architects, engineers, and construction professionals in developing plans and related documentation for residential and commercial projects in both the private and public sectors. Includes instruction in architectural drafting, computer-assisted drafting, construction materials and methods, environmental systems, codes and standards, structural principles, cost estimation, planning, graphics, and presentation.

Building Construction Technology:
A program that prepares individuals to apply technical knowledge and skills to residential and commercial building construction and remodeling. Includes instruction in construction equipment and safety; site preparation and layout; construction estimating; print reading; building codes; framing; masonry; heating, ventilation, and air conditioning; electrical and mechanical systems; interior and exterior finishing; and plumbing.

Carpentry:
A program that prepares individuals to apply technical knowledge and skills to lay out, cut, fabricate, erect, install, and repair wooden structures and fixtures, using hand and power tools. Includes instruction in technical mathematics, framing, construction materials and selection, job estimating, print reading, foundations and roughing-in, finish carpentry techniques, and applicable codes and standards.

**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.*

Construction Management Technology:
A program that prepares individuals to supervise, manage, and inspect construction sites, buildings, and associated facilities. Includes instruction in site safety, personnel supervision, labor relations, diversity training, construction documentation, scheduling, resource and cost control, bid strategies, rework prevention, construction insurance and bonding, accident management and investigation, applicable law and regulations, and communication skills.

Masonry:
A program that prepares individuals to apply technical knowledge and skills in the laying and/or setting of exterior brick, concrete block, and related materials, using trowels, levels, hammers, chisels, and other hand tools. Includes instruction in technical mathematics, print reading, structural masonry, decorative masonry, foundations, reinforcement, mortar preparation, cutting and finishing, and applicable codes and standards.

Plumbing:
A program that prepares individuals to work in the field of plumbing by applying technical knowledge and skills to lay out, assemble, install, and maintain piping fixtures and systems for natural gas, lp gas, hot water, drainage, sprinkling, and plumbing processing systems in residential and commercial environments. Includes instruction in source determination, water service and distribution, waste removal, pressure adjustment, basic physics, technical mathematics, print reading, pipe installation, pumps, soldering, plumbing inspection, and applicable codes and standards.

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Construction: Architecture and Construction Technology

Recommended 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.				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
* ENG 101 Applied Communications I	3 SHC			
* ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
* SOC 105 Social Relationships	3 SHC			
SOC 210 Intro to Sociology	3 SHC			
SOC 215 Group Process	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurements	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

*Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core..

Construction: Architecture and Construction Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**24 SHC**		
For AAS Degree programs, select a minimum of (12) semester hours of credit from the following courses. For Diploma programs, choose a minimum of (3) semester hours of credit from the following courses.			
ARC 112 Constr Matls & Methods — 4 SHC			
ARC 131 Building Codes — 3 SHC			
ARC 132 Specifications & Contract — 2 SHC			
BPR 130 Print Reading – Construction — 3 SHC			
CMT 120 Codes and Inspections — 3 SHC			
CST 241 Planning/Estimating I — 3 SHC			
SST 140 Green Building & Design Concepts — 3 SHC			
B. Program Major(s).			
For the 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.			
Architectural Technology			
ARC 111 Intro to Arch Technology — 3 SHC			
ARC 114 Architectural CAD — 2 SHC			
ARC 113 Res Arch Tech — 3 SHC			
or ARC 211 Light Const Tech — 3 SHC			
ARC 213 Design Project — 4 SHC			
ARC 230 Environmental Systems — 4 SHC			
Building Construction Technology			
CAR 111 Carpentry I — 8 SHC			
or CST 111 Construction I — 4 SHC *and*			
CST 112 Construction II — 4 SHC			
CST 221 Statics/Structures — 4 SHC			

Construction Management Technology

	CMT	210	Construction Management Fund	3 SHC
	CMT	212	Total Safety Performance	3 SHC
	ACC	120	Prin of Financial Acct	4 SHC
or	BUS	139	Entrepreneurship I	3 SHC
or	BUS	230	Small Business Management	3 SHC

Carpentry *Course(s) required for the Carpentry Diploma are designated with* *

*	CAR	111	Carpentry I	8 SHC

Masonry *Course(s) required for the Masonry Diploma are designated with* *

*	MAS	110	Masonry I	10 SHC

Plumbing *Course(s) required for the Plumbing Diploma are designated with* *

*	PLU	110	Modern Plumbing	9 SHC

C. Other Major Hours.

To be selected from the following prefixes:

ACC, AHR, ALT, ARC, ART, BPR, BUS, CAB, CAR, CIS, CIV, CMT, COE, CSC, CST, DES, DFT, ECO, EGR, EHS, ELC, ENV, EUS, GIS, HYD, HOR, HUM, ISC, LAR, LID, MAS, MAT, MEC, PFT, PHY, PLU, REF, SPA, SRV, SST, TRF, WAT, WLD, and WOL.

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Construction: Boat Building

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Boat Building	CIP Code 46.0201	Diploma/Certificate	D35120

Pathway Description:

The Boat Building curriculum prepares individuals for employment in the boat building and boat repair industry. Today's boat builders are highly skilled craftspeople who can create complex shapes out of wood.

Course work includes reading boat plans, lofting, setting up the building jig, fashioning the structural timbers, and different planking techniques. Interior joinery, exterior joinery, and yacht rigging is also covered.

Graduates may find work with yacht manufacturers, high end furniture shops, architectural millwork shops, and companies installing built in furniture in homes. Other opportunities can be found in boat maintenance and repair yards.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Construction: Boat Building

Recommended General Education Academic Core		AAS	Diploma	Certificate
Minimum General Education Hours Required:		**NA**	**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.				
Communication:		**NA**	**3-6 SHC**	**Optional**
COM 101	Workplace Communication	3 SHC		
COM 110	Introduction to Communication	3 SHC		
COM 120	Intro Interpersonal Com	3 SHC		
COM 231	Public Speaking	3 SHC		
ENG 101	Applied Communications I	3 SHC		
ENG 102	Applied Communications II	3 SHC		
ENG 110	Freshman Composition	3 SHC		
ENG 111	Expository Writing	3 SHC		
ENG 114	Prof Research & Reporting	3 SHC		
ENG 116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:		**NA**	**0-3 SHC**	**Optional**
HUM 101	Values in the Workplace	2 SHC		
HUM 110	Technology and Society	3 SHC		
HUM 115	Critical Thinking	3 SHC		
HUM 230	Leadership Development	3 SHC		
PHI 230	Introduction to Logic	3 SHC		
PHI 240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:		**NA**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC		
ECO 251	Prin of Microeconomics	3 SHC		
SOC 105	Social Relationships	3 SHC		
SOC 215	Group Processes	3 SHC		
PSY 101	Applied Psychology	3 SHC		
PSY 102	Human Relations	2 SHC		
PSY 118	Interpersonal Psychology	3 SHC		
PSY 135	Group Processes	3 SHC		
PSY 150	General Psychology	3 SHC		
Natural Sciences/Mathematics:		**NA**	**0-3 SHC**	**Optional**
MAT 101	Applied Mathematics I	3 SHC		
MAT 110	Mathematical Measurement	3 SHC		
MAT 115	Mathematical Models	3 SHC		
MAT 120	Geometry and Trigonometry	3 SHC		
MAT 121	Algebra/Trigonometry I	3 SHC		
PHY 110	Conceptual Physics	3 SHC		
PHY 121	Applied Physics I	4 SHC		

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Construction: Boat Building			**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:			**49 SHC**	**30 SHC**	**12 SHC**
Technical Core/Program Major:				**35 SHC**	
BTB	101 Boat Building I	10 SHC			
BTB	102 Boat Building II	9 SHC			
BTB	103 Yacht Joiner Practices I	4 SHC			
BTB	104 Yacht Joiner Practices II	3 SHC			
BTB	105 Yacht Repair/Renovation	5 SHC			
BTB	109 Yacht Rigging	2 SHC			
DFT	100 Marine Drafting	2 SHC			

C. Other Major Hours

To be selected from the following prefixes:

BTB, CIS, COE, DDF, DFT, FBG, and ISC

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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 the skills necessary to create opportunities and develop as an employee or self-employed business owner.

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

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

Curriculum Standard for Construction: Historic Preservation Technology

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code			Credential Level(s) Offered	Program Major Code
Historic Preservation Technology	CIP Code	30.1201	AAS/Diploma/Certificate	A35110

Pathway Description:

The Historic Preservation Technology curriculum provides courses related to the documentation and preservation of cultural and historic buildings and sites. The program emphasizes technical training in historic site and historic building preservation and restoration.

Course work includes archival research, building design, drafting, conservation techniques, building renovation, field data collection, historic preservation, documentation, sustainable building design, and the application of preservation law.

Graduates of this pathway should qualify for work as building renovation and site specialists, historic preservation consultants or as assistants to professional historic preservationists.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Construction: Historic Preservation Technology

Recommended 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.					
Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Prof Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
*SOC 105	Social Relationships	3 SHC			
SOC 215	Group Processes	3 SHC			
*PSY 101	Applied Psychology	3 SHC			
*PSY 102	Human Relations	2 SHC			
PSY 118	Interpersonal Psychology	3 SHC			
PSY 135	Group Processes	3 SHC			
PSY 150	General Psychology	3 SHC			
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
*MAT 101	Applied Mathematics I	3 SHC			
MAT 110	Mathematical Measurement	3 SHC			
MAT 115	Mathematical Models	3 SHC			
MAT 120	Geometry and Trigonometry	3 SHC			
MAT 121	Algebra/Trigonometry I	3 SHC			
PHY 110	Conceptual Physics	3 SHC			
PHY 121	Applied Physics I	4 SHC			

Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Construction: Historic Preservation Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core/Program Major: *Courses required for the diploma program major are designated with an asterisk (*).*	**22-23 SHC**	**21 SHC**	
*CST 244 Sustainable Bldg Design — 3 SHC			
*HPT 116 Historical Drafting — 2 SHC			
*HPT 110 Hist & Cultural Landscape — 3 SHC			
*HPT 111 Prin of Hist Preservation — 3 SHC			
*HPT 133 Historic Bldg Analysis — 3 SHC			
*HPT 233 Hist Construction Methods — 4 SHC			
*HPT 252 Recording Hist Properties — 3 SHC			
Required Subject Area: Co-Op Work Experience. Select One.			
COE 111 Co-Op Work Experience I — 1 SHC			
COE 122 Co-Op Work Experience II — 2 SHC			

C. Other Major Hours.

To be selected from the following prefixes:

ARC, BUS, CIS, COE, CSC, CST, DFT, ELC, HIS, HPT, and MAS

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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 the skills necessary to create opportunities and develop as an employee or self-employed business owner.

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

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

Curriculum Standard for Construction: Landscape Architecture Technology

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Landscape Architecture Technology	CIP Code 04.0601	AAS/Diploma/Certificate	A40260

Pathway Description:

The Landscape Architecture Technology curriculum prepares individuals as landscape architecture technicians in landscape design, construction, and architecture fields. The well-trained landscape technician will find excellent prospects for employment and advancement, including large-scale site design and supervision and residential landscape design.

Students receive instruction in landscape construction materials and methods, environmental planning, principles of horticulture, building codes, and computer applications. They develop drafting and computer skills through progressive hands-on courses. Students may choose from a library of courses to suit specific interest areas.

Graduates will demonstrate a working knowledge of landscape architectural practices, including site planning, storm water engineering, road and parking layouts, and grading and plant selection according to zoning/code requirements.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Construction: Landscape Architecture Technology

Recommended 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 not be included in associate degree programs.*

Communications:			**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 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Prof Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**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:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
GEO 111	World Regional Geography	3 SHC			
GEO 131	Physical Geography I	4 SHC			
SOC 210	Introduction to Sociology	3 SHC			
SOC 215	Group Process	3 SHC			
PSY 118	Interpersonal Psychology	3 SHC			
PSY 135	Group Processes	3 SHC			
PSY 150	General Psychology	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			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core or other Major Areas.

Construction: Landscape Architecture Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
Technical Core/Program Major: *A diploma offered under this AAS degree requires a minimum of 12 SHC extracted from the required subject/course core of the AAS degree.*	**29 SHC**	**12 SHC**	
ARC 114 Architectural CAD 2 SHC ARC 240 Site Planning 3 SHC LAR 111 Intro to Landscp Arc Tech 3 SHC LAR 112 Landscape Materials & Methods 4 SHC LAR 113 Res Landscape Design 3 SHC LAR 211 Commercial Site Design 3 SHC LAR 223 Land Design Project 4 SHC LAR 230 Prin of Exterior Planting 4 SHC LAR 231 Prin of Interior Planting 3 SHC			

C. Other Major Hours.

To be selected from the following prefixes:

ARC, BIO, BPR, CIS, CIV, COE, CSC, ENV, GIS, HOR, LAR, SRV, and TRF

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Construction: Low Impact Development

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction	**Effective Term:** Fall 2013 (2013*03)

Program Majors Included Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Low Impact Development	CIP Code 15.0599	AAS/Diploma/Certificate	A40290

Pathway Description:

The Low Impact Development (LID) curriculum is designed to prepare students interested in sustainable development and natural resource management with the technical skills to serve as specialists in the analysis of land and in the preparation of LID recommendations.

The program of study will consist of a multidisciplinary core of coursework including the study of land planning software programs, soils, site analysis, hydrology, geospatial technology, and environmental regulations.

Graduates should qualify for a variety of positions such as LID consultants, technicians, and/or liaisons between landscape architects, engineers, construction contractors and/or related professionals.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Construction: Low Impact Development

Recommended General Education Academic Core			AAS	Diploma	Certificate
Minimum General Education Hours Required:			**15 SHC**	**6 SHC**	**0 SHC**
The 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:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Prof Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
*SOC 105	Social Relationships	3 SHC			
SOC 215	Group Process	3 SHC			
*PSY 101	Applied Psychology	3 SHC			
*PSY 102	Human Relations	2 SHC			
PSY 118	Interpersonal Psychology	3 SHC			
PSY 135	Group Processes	3 SHC			
PSY 150	General Psychology	3 SHC			
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
*MAT 101	Applied Mathematics I	3 SHC			
MAT 110	Mathematical Measurement	3 SHC			
MAT 115	Mathematical Models	3 SHC			
MAT 120	Geometry and Trigonometry	3 SHC			
MAT 121	Algebra/Trigonometry I	3 SHC			
PHY 110	Conceptual Physics	3 SHC			
PHY 121	Applied Physics I	4 SHC			

Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Construction: Low Impact Development				**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:				**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:				**44-51 SHC**	**15 SHC**	
Courses required for the diploma program major are designated with an asterisk (*).						
*LAR	120	Sustainable Development	3 SHC			
*LID	111	LID Design Principles	3 SHC			
*LID	112	LID Practical Application	3 SHC			
*LID	230	Impacted Site Remediation	3 SHC			
*LID	240	Sustain Develop Design	3 SHC			
B. Program Major: Low Impact Development						
Drafting and Design. *Select three courses:*						
DFT	151	CAD I	3 SHC			
DFT	152	CAD II	3 SHC			
HOR	112	Landscape Design I	3 SHC			
LAR	111	Intro to Landscape Arc Tech	3 SHC			
LAR	114	CAD for Land Development	2 SHC			
LAR	221	Landscape CAD	3 SHC			
Intro to GIS/GPS. *Select one set:*						
GIS	111	Introduction to GIS	3 SHC *and*			
GIS	112	Introduction to GPS	3 SHC			
or FOR	215	Introduction to GIS/GPS	3 SHC			
Geographic Analysis. *Select two courses:*						
GIS	121	Georeferencing & Mapping	3 SHC			
GIS	231	Geo Position Sys Methods	3 SHC			
GIS	245	Intro to Spatial Analysis	3 SHC			
GIS	246	Prin of Property Mapping	3 SHC			

Plant Materials. Select two courses:

FOR	121	Dendrology	4 SHC
HOR	160	Plant Materials I	3 SHC
HOR	161	Plant Materials II *(may change to HOR 260)*	3 SHC
LAR	230	Prin of Exterior Planting	4 SHC
LAR	231	Prin of Interior Planting	3 SHC

Soil Science. Select two courses:

CST	231	Soils and Site Work	4 SHC
FOR	173	Soils & Hydrology	3 SHC
HOR	166	Soils & Fertilizers	3 SHC

C. Other Major Hours.

To be selected from the following prefixes:

ARC, BIO, BPR, CIS, CIV, COE, CST, DFT, ENV, FOR, GIS, HOR, LAR, LID, and SRV

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Electrical Systems Technology

Career Cluster: Architecture and Construction**

Cluster Description: Programs that prepare individuals to apply technical knowledge and skills related to the fields of architecture, construction, and associated professions. Includes instruction that can be applied to a variety of careers in the design-construction industry, including employment with architectural and engineering firms, residential and commercial builders/contractors, and other construction related occupations.

Pathway: Construction	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Electrical Systems Technology	CIP Code: 46.0302	AAS/Diploma/Certificate	A35220

Pathway Description:

This curriculum is designed to provide training for persons interested in the installation and maintenance of electrical systems found in residential, commercial, and industrial facilities.

Coursework, most of which is hands-on, will include such topics as AC/DC theory, basic wiring practices, programmable logic controllers, industrial motor controls, applications of the National Electric Code, and other subjects as local needs require.

Graduates should qualify for a variety of jobs in the electrical field as an on-the-job trainee or apprentice assisting in the layout, installation, and maintenance of electrical systems.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Electrical Systems Technology

Recommended 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 not be included in associate degree programs.*

			AAS	Diploma	Certificate
Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication 3 SHC			
COM	110	Introduction to Communications 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	Prof Research & Reporting 3 SHC			
ENG	116	Technical Report Writing 3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace 2 SHC			
HUM	110	Technology and Society 3 SHC			
HUM	115	Critical Thinking 3 SHC			
HUM	230	Leadership Development 3 SHC			
PHI	230	Introduction to Logic 3 SHC			
PHI	240	Introduction to Ethics 3 SHC			
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics 3 SHC			
ECO	251	Prin of Microeconomics 3 SHC			
*PSY	101	Applied Psychology 3 SHC			
*PSY	102	Human Relations 2 SHC			
PSY	118	Interpersonal Psychology 3 SHC			
PSY	135	Group Processes 3 SHC			
PSY	150	General Psychology 3 SHC			
*SOC	105	Social Relationships 3 SHC			
SOC	210	Introduction to Sociology 3 SHC			
SOC	215	Group Process 3 SHC			
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
*MAT	101	Applied Mathematics I 3 SHC			
MAT	110	Mathematical Measurements 3 SHC			
MAT	115	Mathematical Models 3 SHC			
MAT	120	Geometry and Trigonometry 3 SHC			
MAT	121	Algebra/Trigonometry I 3 SHC			
PHY	110	Conceptual Physics 3 SHC			
PHY	121	Applied Physics I 4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Electrical Systems Technology (A35220)	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: *Courses required for the diploma are designated with **	**27-32 SHC**	**12-16 SHC**	
Required Courses:			
* ELC 113 Residential Wiring 4 SHC			
* **Motor Controls. Select one:**			
ELC 117 Motors and Controls 4 SHC			
ELN 231 Industrial Controls 3 SHC			
* **DC/AC. Select one:**			
ELC 112 DC/AC Electricity 5 SHC			
or ELC 131 Circuit Analysis I 4 SHC *and*			
ELC 131A Circuit Analysis I Lab 1 SHC			
or ELC 138 DC Circuit Analysis 4 SHC *and*			
ELC 139 AC Circuit Analysis 4 SHC			
Automated Controls. Select one:			
ELC 128 Introduction to PLC 3 SHC			
ELN 260 Prog Logic Controllers 4 SHC			
Required Subject Areas: Select one.			
For AAS degree, select one subject area plus additional courses from the prefixes listing within the same subject area for a minimum of (12) semester hours of credit:			
Electrical Systems. Select 12 SHC from any ELC prefix course.			
Photovoltaic Systems.			
ALT 120 Renewable Energy Tech 3 SHC			
ELC 118 National Electrical Code 2 SHC			
ELC 220 Photovoltaic Sys Tech 3 SHC			
ELC 221 Adv PV Sys Design 3 SHC			
Electronics.			
ELN 131 Semiconductor Appli 4 SHC			
or ELN 137 Electr Devices & Circuits 5 SHC			
or ELN 229 Industrial Electronics 4 SHC			
B. Program Major(s): Not Applicable			

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

AHR, ALT, ATR, BIO, BPR, BUS, CET, CHM, CIS, CMT, COE, CSC, CST, DFT, EGR, ELC, ELN, EUS, HEA, HYD, ISC, MAT, MAC, MEC, MNT, NET, OMT, PCI, PHY, PLA, PLU, SST, WLD, and WOL

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

Curriculum Standard for Education/Training: Outdoor Leadership

Career Cluster: Education & Training **

Cluster Description: Planning, managing and providing education and training services, and related learning support services.

Pathway: Education/Training: Outdoor Leadership	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Outdoor Leadership	CIP Code 31.0601	AAS/Diploma/Certificate	A55330

Pathway Description:

This curriculum is designed to prepare individuals to be successful professionals in outdoor adventure, education and leadership.

Course work includes technical training in the areas such as backpacking, canoeing, kayaking, and rock-climbing. These skills are taught through facilitation and experiential learning methodologies. This course of study includes interpersonal skills and leadership skills such as group process, conflict resolution, program planning, and management issues.

Graduates from this program will have a sound background in outdoor leadership blended with a solid foundation of general education, business, and computer skills. Graduates are prepared for employment in the adventure tourism industry, therapeutic wilderness programs, specialized adventure/leadership programs, adventure programs for youth, challenge course industry, city, county, and state outdoor programs, public and private outdoor education centers, and private and public school outdoor programs.

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

Outdoor Leadership: A program that prepares individuals to work as an educator, instructor or facilitator in parks, recreational facilities, camps and other outdoor settings. Potential course work includes instruction in leadership skills, wilderness survival skills, first aid, group processes, counseling techniques, environmental studies and instruction in recreational activities such as rock climbing, ropes courses, backpacking, kayaking and canoeing.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Education/Training: Outdoor Leadership

Recommended General Education Academic Core		AAS	Diploma	Certificate
Minimum General Education Hours Required:		**15 SHC**	**6 SHC**	**0 SHC**
The courses listed below are recommended general education courses for this curriculum standard. Colleges may choose o include additional or alternative general education courses to meet local curriculum needs. **Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Education/Training: Outdoor Leadership		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:		**37 SHC**		
BUS 137 Principles of Management	3 SHC			
ODL 110 Introduction to Outd Leadership	3SHC			
ODL 115 Methods of Experiential Education	3 SHC			
ODL 120 Challenge Course Facilitation	3 SHC			
ODL 125 Wilderness First Responder	4 SHC			
ODL 130 Water Based Activities I	3 SHC			
ODL 135 Land Based Activities I	3 SHC			
B. Program Major(s):				
Outdoor Leadership				
ODL 210 Water Based Activities II	3 SHC			
ODL 212 Land Based Activities II	3 SHC			
ODL 215 Admin & Policy Public Lan	3 SHC			
ODL 220 Climbing	3 SHC			
ODL 228 Outdr Ldrship Spec Pop	3 SHC			

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

BUS, CIS, COE, ETR, MED, ODL, PED, REC and SEM

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Industrial Systems Technology

Career Cluster: Manufacturing**

Cluster Description: Planning, managing and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

Pathway: Maintenance, Installation, & Repair	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Industrial Systems Technology	CIP Code 15.0499	AAS/Diploma/Certificate	A50240

Pathway Description:

The Industrial Systems Technology curriculum is designed to prepare or upgrade individuals to safely service, maintain, repair, or install equipment. Instruction includes theory and skill training needed for inspecting, testing, troubleshooting, and diagnosing industrial systems.

Students will learn multi-craft technical skills in print reading, mechanical systems maintenance, electricity, hydraulics/pneumatics, welding, machining or fabrication, and includes various diagnostic and repair procedures. Practical application in these industrial systems will be emphasized and additional advanced course work may be offered.

Upon completion of this curriculum, graduates should be able to individually, or with a team, safely install, inspect, diagnose, repair, and maintain industrial process and support equipment. Students will also be encouraged to develop their skills as life-long learners.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Industrial Systems Technology

Recommended 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 not be included in associate degree programs.*

Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC		
COM	110	Introduction to Communications	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	Prof Research & Reporting	3 SHC		
ENG	116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC		
HUM	110	Technology and Society	3 SHC		
HUM	115	Critical Thinking	3 SHC		
HUM	230	Leadership Development	3 SHC		
PHI	230	Introduction to Logic	3 SHC		
PHI	240	Introduction to Ethics	3 SHC		
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC		
ECO	251	Prin of Microeconomics	3 SHC		
*PSY	101	Applied Psychology	3 SHC		
*PSY	102	Human Relations	2 SHC		
PSY	118	Interpersonal Psychology	3 SHC		
PSY	135	Group Processes	3 SHC		
PSY	150	General Psychology	3 SHC		
*SOC	105	Social Relationships	3 SHC		
SOC	210	Introduction to Sociology	3 SHC		
SOC	215	Group Process	3 SHC		
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
*MAT	101	Applied Mathematics I	3 SHC		
MAT	110	Mathematical Measurements	3 SHC		
MAT	115	Mathematical Models	3 SHC		
MAT	120	Geometry and Trigonometry	3 SHC		
MAT	121	Algebra/Trigonometry I	3 SHC		
PHY	110	Conceptual Physics	3 SHC		
PHY	121	Applied Physics I	4 SHC		

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Industrial Systems Technology (A50240)	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: *Courses required for the diploma are designated with **	**27-35 SHC**	**15-23 SHC**	
*MNT 110 Intro to Maint Procedures — 2 SHC			
*WLD 112 Basic Welding Processes — 2 SHC			
*HYD 110 Hydraulics/Pneumatics I — 3 SHC			
*** Electricity. Select one:**			
ELC 111 Intro to Electricity — 3 SHC			
ELC 112 DC/AC Electricity — 5 SHC			
ELC 131 Circuit Analysis I — 4 SHC			
*** Prints and Diagrams. Select one:**			
BPR 111 Print Reading — 2 SHC			
BPR 115 Elc/Fluid Power Diagrams — 2 SHC			
BPR 135 Schematics & Diagrams — 2 SHC			
ELC 125 Diagrams and Schematics — 2 SHC			
*** Metalworking and Fabrication. Select one:**			
MAC 111 Machining Technology I — 6 SHC			
MAC 141 Machining Applications I — 4 SHC			
MEC 111 Machine Processes I — 3 SHC			
MNT 131 Metalworking Processes — 3 SHC			
MNT 160 Industrial Fabrication — 2 SHC			
*** Safety. Select one:**			
ISC 110 Workplace Safety — 1 SHC			
ISC 112 Industrial Safety — 2 SHC			
ISC 121 Envir Health & Safety — 3 SHC			

Required Subject Areas: Select one.

For AAS degree, select one subject area plus additional courses from the prefixes listing within the same subject area for a minimum of (12) semester hours of credit:

Industrial Systems.

Select 12 SHC from prefixes listed in the technical core.

Biofuels Production.

	ALT	110	Biofuels I	3 SHC
	ALT	210	Biofuels II	4 SHC
	ALT	211	Biofuels Analytics	4 SHC

Electrical Power Production.

	EPP	110	Intro to Power Plant Oper	2 SHC
	EPP	112	Fuels and Combustion	3 SHC
	EPP	210	Power Plant Systems	3 SHC
	EPP	212	Steam & Combustion TG	3 SHC
	EPP	214	Power Plant Environ Mgt	2 SHC

Biogas Systems.

	WAT	161	Solid Waste Management	2 SHC
	ISC	255	Engineering Economy	3 SHC
	WLD	145	Thermoplastic Welding	2 SHC
	ALT	130	Biogas Operations	2 SHC *and*
	ALT	130A	Biogas Operations Lab	1 SHC
or	COE	111	Co-op Work Experience I	1 SHC
	ALT	131	Biogas Processes	2 SHC *and*
	ALT	131A	Biogas Processes Lab	1 SHC
or	COE	121	Co-op Work Experience II	1 SHC

B. Program Major(s): Not Applicable

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

ALT AHR, ATR, BPM, BPR, CIS, CMT, COE, CSC, DFT, EGR, ELC, ELN, EPP, HET, HYD, ISC, MAC, MEC, MNT, NET, OMT, PCI, PFT, PHS, PHY, PKG, PLU, PPT, PTC, SST, WAT, WLD, and WOL

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Manufacturing Production and Process Development: Manufacturing and Industrial Engineering Technology

Career Cluster: Manufacturing**

Cluster Description: Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

Pathway: Manufacturing Production Process Development	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Industrial Engineering Technology	CIP Code: 15.0612	AAS/Diploma/Certificate	A40240
Industrial Management Technology	CIP Code: 52.0205	AAS/Diploma/Certificate	A50260
Manufacturing Technology	CIP Code: 15.0699	AAS/Diploma/Certificate	A50320
Quality Assurance and Continuous Improvement	CIP Code: 15.0702	AAS/Diploma/Certificate	A50XXX

Pathway Description: These curriculums are designed to prepare students through the study and application of the principles for developing, implementing and improving integrated systems involving people, materials, equipment and information as leaders in an industrial or manufacturing setting.

Course work includes mathematics, systems analysis, leadership and management skills, quality and productivity improvement methods, cost analysis, facilities planning, manufacturing materials and processes, and computerized production methods.

Graduates should qualify as quality improvement technicians, quality assurance and control technicians, front-line supervisors, production planners, inventory supervisors, and manufacturing 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:

Industrial Engineering Technology: A course of study that prepares the students to use basic engineering principles and technical skills to develop, implement, and improve industrial and service systems. Includes instruction in systems analysis, quality and productivity improvement techniques for process development, cost analysis, facilities planning, organizational behavior, industrial processes, industrial planning procedures, computer applications, and report and presentation preparation. Graduates should qualify for employment as industrial process technicians, quality assurance and control technicians, and facilities managers. Certification is available through organizations such as ASQC, SME, and APICS.

Industrial Management Technology: A course of study that prepares the students to use basic engineering principles and management skills to plan and manage operations of industrial and manufacturing processes. Includes instruction in financial management, industrial and human resources management, industrial psychology, management information systems, quality and productivity improvement, quality control, operations research, safety and health issues, and environmental program management. Graduates should be qualified to enter the workforce as front-line supervisor, engineering assistant, production planner, inventory supervisor, or as a quality control technician. With additional training and experience, graduates could become plant manager or production managers.

Manufacturing Technology: A course of study that prepares students to use basic engineering principles and technical skills to identify and resolve production problems in the manufacture of products. Includes instruction in

**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.*

machine operations and CNC principles, production line operations, instrumentation, computer-aided manufacturing (CAM) and other computerized production techniques, manufacturing planning, quality control, quality assurance and informational infrastructure. Graduates should qualify for employment as a manufacturing technician, quality assurance technician, CAD/CAM technician, team leader, or research and development technician.

Quality Assurance and Continuous Improvement: A course of study that prepares the students to use basic engineering principles and technical skills in maintaining consistent manufacturing and construction standards. Includes instruction in quality control systems management principles, technical standards applicable to specific engineering and manufacturing projects, testing procedures, inspection procedures, related instrumentation and equipment operation and maintenance, and report preparation. Graduates should qualify for employment as quality control systems technicians and managers, quality control analysts, inspectors, testers, and compliance managers. Certification is available through organizations such as ASQC, SME and APICS.

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Manufacturing Production Process Development: Manufacturing and Industrial 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. **Communications**:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Professional Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
GEO 110	Introduction to Geography	3 SHC			
GEO 111	World Regional Geography	3 SHC			
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			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Manufacturing Production Process Development: Manufacturing and Industrial Engineering Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
*Courses required for a diploma are designated with **	**19-21 SHC**	**12 SHC**	
A. Technical Core:			
*ISC 132 Mfg Quality Control 3 SHC			
**Choose one:*			
DFT 111 Technical Drafting I 2 SHC			
DFT 119 Basic CAD 2 SHC			
DFT 151 CAD I 3 SHC			
DFT 170 Engineering Graphics 3 SHC			
EGR 120 Eng and Design Graphics 3 SHC			
ISC 112 Industrial Safety 2 SHC			
OR			
ISC 121 Envir Health & Safety 3 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.			
Industrial Engineering Technology			
ISC 135 Principles of Industrial Mgmt 3 SHC			
ISC 136 Productivity Analysis I 3 SHC			
ISC 243 Prod & Oper Management I 3 SHC			
Choose one:			
MEC111 Machine Processes I 3 SHC			
MEC145 Mfg Materials I 3 SHC			
MEC161 Manufacturing Processes I 3 SHC			
Industrial Management Technology			
*ISC 135 Principles of Industrial Mgmt 4 SHC			
*ISC 136 Productivity Analysis I 3 SHC			
ISC 233 Industrial Org & Mgmt 3 SHC			

Manufacturing Technology					
*Choose one:					
MEC 145	Mfg_Materials I	3 SHC			
MEC 180	Engineering Materials	3 SHC			
*Choose one:					
ISC 212	Metrology	2 SHC			
MAC114	Intro to Metrology	2 SHC			
MEC151	Mechanical Mfg Systems	2 SHC			
*Choose one:					
ATR 112	Intro to Automation	3 SHC			
BPR 111	Print Reading	2 SHC			
HYD110	Hydraulics/Pneumatics I	3 SHC			
HYD 180	Pneumatics in Automation	3 SHC			
ISC 220	Lean Manufacturing	3 SHC			
Quality Assurance and Continuous Improvement					
*ISC 135	Principles of Industrial Management	4 SHC			
ISC 212	Metrology	2 SHC			
ISC 220	Lean Manufacturing	3 SHC			
*ISC 270	Quality Systems Elements	2 SHC			
*ISC 271	Sampling & Reliability	2 SHC			
ISC 272	Quality Mgmt Concepts	2 SHC			
ISC 275	Auditing Quality Systems	3 SHC			
*MAC114	Intro to Metrology	2 SHC			
*MEC145	Mfg Materials I	3 SHC			
OR					
*MEC180	Engineering Materials	3 SHC			

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

ACA, ACC, ALT, ATR, BAT, BIO, BPM, BPR, BTC, BUS, CEG, CET, CIS, CIV, CHM, CMT, COE, CSC, CST, CTS, CTI, DBA, DDF, DFT, ECO, EGR, ELC, ELN, HYD, ISC, MAC, MAT, MEC, NOS, OMT, PHY, PLA, PTC, SRV, SST, WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Production: Welding Technology

Career Cluster: *Manufacturing***

Cluster Description: A program that prepares individuals to apply technical knowledge and skills to join or cut metal. Includes instruction in arc welding, resistance welding, cutting, welding processes, safety, and applicable codes and standards.

Pathway: Production	**Effective Term:** Fall 2013 (2013*03)

Program Majors Included Under the Production Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Welding Technology	CIP Code 48.0508	AAS/Diploma/Certificate	A50420

Pathway Description:

The Welding Technology curriculum provides students with a sound understanding of the science, technology, and applications essential for successful employment in the welding and metalworking industry.

Instruction includes consumable and non-consumable electrode welding and cutting processes. Courses may include math, print reading, metallurgy, welding inspection, and destructive and non-destructive testing providing the student with industry-standard skills developed through classroom training and practical application.

Graduates of the Welding Technology curriculum may be employed as entry-level technicians in welding and metalworking industries. Career opportunities also exist in construction, manufacturing, fabrication, sales, quality control, supervision, and welding-related self-employment.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Production: Welding Technology

Recommended 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 not be included in associate degree programs.*

Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Prof Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 128	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
*SOC 105	Social Relationships	3 SHC			
SOC 215	Group Processes	3 SHC			
*PSY 101	Applied Psychology	3 SHC			
*PSY 102	Human Relations	2 SHC			
PSY 118	Interpersonal Psychology	3 SHC			
PSY 135	Group Processes	3 SHC			
PSY 150	General Psychology	3 SHC			
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
*MAT 101	Applied Mathematics I	3 SHC			
MAT 110	Mathematical Measurement	3 SHC			
MAT 115	Mathematical Models	3 SHC			
MAT 120	Geometry and Trigonometry	3 SHC			
MAT 121	Algebra/Trigonometry I	3 SHC			
PHY 110	Conceptual Physics	3 SHC			
PHY 121	Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Production: Welding Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
Technical Core/Program Major: *Courses required for the diploma program major are designated with an asterisk (*).* *WLD 110 Cutting Processes 2 SHC *WLD 115 SMAW (Stick) Plate 5 SHC *WLD 121 GMAW (MIG) FCAW/Plate 4 SHC *WLD 131 GTAW (TIG) Plate 4 SHC *WLD 141 Symbols & Specifications 3 SHC	**18 SHC**	**18 SHC**	

C. Other Major Hours.

To be selected from the following prefixes:

BPR, BUS, CIS, COE, CSC, DFT, ELC, ISC, MAC, MAT, MEC, OMT, PCJ, PCS, PHY, WLD, and WOL.

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Quality Assurance: Nondestructive Examination Technology

Career Cluster: Manufacturing**

Cluster Description: Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

Pathway: Quality Assurance	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Nondestructive Examination Technology	CIP Code: 41.0204	AAS/Diploma/Certificate	A50350

Pathway Description: This curriculum is designed to prepare students to use scientific principles and technical skills to the operation of industrial and research testing equipment.

The 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:

Nondestructive Examination Technology: This course of study prepares the students to apply technical skills in nondestructive testing of materials and component parts for flaws or defects jeopardizing structural integrity. Course work includes ultrasonics, radiography, liquid penetrant, magnetic particle eddy current and visual testing methods. Applied math and physics are an integral part of NDE and the curriculum. The NDE curriculum meets the initial training requirements of ASNT' s SNT-TC-1A, permitting graduates to obtain NDE certification after a few months of on-the-job experience. Career opportunities exist in applied NDE, material sciences, technical sales, and quality control in many industries.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Quality Assurance: Nondestructive Examination 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.					
Communications:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Professional Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
GEO 110	Introduction to Geography	3 SHC			
GEO 111	World Regional Geography	3 SHC			
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			

*Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Quality Assurance: Nondestructive Examination Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
*Courses required for a diploma are designated with **	**24 SHC**	**14 SHC**	
A. Technical Core:			
* NDE 110 Intro to Nondestr Exam	3 SHC		
* NDE 112 Materials and Processes	3 SHC		
* NDE 121 Prin of Ultrason Exam UT	4 SHC		
* NDE 122 Angle Beam Examination	4 SHC		
NDE 131 Rad Safety & Prin of RT	4 SHC		
NDE 141 Surface Testing (VT/PT)	3 SHC		
NDE 151 Electromag Test (MT/ET)	3 SHC		
B. Program Major: Not applicable			

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

CIS, COE, CSC, DFT, EGR, ELC, ISC,MAC, MAT, MEC, NDE, PHY, SST, and WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Engineering and Technology: Applied, Automation, Mechatronics 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 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Applied Engineering Technology	CIP Code: 15.0000	AAS/Diploma/Certificate	A40130
Automation Engineering Technology	CIP Code: 15.0406	AAS/Diploma/Certificate	A40120
Mechatronics Engineering Technology	CIP Code: 15.0403	AAS/Diploma/Certificate	A40350

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, 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:

Applied Engineering Technology: A course of study that prepares the students to use basic engineering principles and technical skills to solve technical problems in various types of industry. The course work emphasizes analytical and problem-solving skills. The curriculum includes courses in safety, math, physics, electricity, engineering technology, and technology-specific specialty areas. Graduates should qualify for employment in a wide range of positions in research and development, manufacturing, sales, design, inspection, or maintenance. Employment opportunities exist in automation, computer, electrical, industrial, or mechanical engineering fields, where graduates will function as engineering technicians.

Automation Engineering Technology: A course of study that prepares the students to use basic engineering principles and technical skills to develop, install, calibrate, modify and maintain automated systems. Includes instruction in computer systems; electronics and instrumentation; programmable logic controllers (PLCs); electric, hydraulic and pneumatic control systems; actuator and sensor systems; process control; robotics; applications to specific industrial tasks. The graduates of this curriculum will be prepared for employment in industries that utilize control systems, computer hardware and software, electrical, mechanical and electromechanical devices in their automation systems.

Mechatronics Engineering Technology: A course of study that prepares the students to use basic engineering principles and technical skills in developing and testing automated, servomechanical, and other electromechanical systems. Includes instruction in prototype testing, manufacturing and operational testing, systems analysis and maintenance procedures. Graduates should be qualified for employment in industrial maintenance and manufacturing including assembly, testing, startup, troubleshooting, repair, process improvement, and control systems, and should qualify to sit for Packaging Machinery Manufacturers Institute (PMMI) mechatronics or similar industry examinations.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Engineering and Technology: Applied, Automation and Mechatronics 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 not be included in associate degree programs.*						
Communications:				**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC			
COM	110	Introduction to Communication	3 SHC			
COM	120	Intro Interpersonal Com	3 SHC			
COM	231	Public Speaking	3 SHC			
*ENG	101	Applied Communications I	3 SHC			
*ENG	102	Applied Communications II	3 SHC			
ENG	110	Freshman Composition	3 SHC			
ENG	111	Expository Writing	3 SHC			
ENG	114	Professional Research & Reporting	3 SHC			
ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:				**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC			
HUM	110	Technology and Society	3 SHC			
HUM	115	Critical Thinking	3 SHC			
HUM	230	Leadership Development	3 SHC			
PHI	230	Introduction to Logic	3 SHC			
PHI	240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:				**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC			
ECO	251	Prin of Microeconomics	3 SHC			
GEO	110	Introduction to Geography	3 SHC			
GEO	111	World Regional Geography	3 SHC			
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			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Engineering and Technology: Applied, Automation, Mechatronics Engineering Technology			**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:			**49 SHC**	**30 SHC**	**12 SHC**
*Courses required for a diploma are designated with **			**16-44 SHC**	**16-24 SHC**	
A. Technical Core:					
***Computer Applications**					
Choose one:					
CIS 110	Introduction to Computers	3 SHC			
EGR 111	Eng Comp and Careers	3 SHC			
EGR 125	Appl Software for Tech	2 SHC			
ELC 127	Software for Technicians	2 SHC			
***Safety**					
Choose one:					
ISC 112	Industrial Safety	2 SHC			
ISC 115	Construction Safety	2 SHC			
B. Program Major(s):					
For AAS Degree select one program major.					
Applied Engineering Technology					
***Computers**					
Choose one:					
DFT 119	Basic CAD	2 SHC			
ELC 127	Software for Technicians	2 SHC			
***Electricity**					
Choose one:					
ELC 131	Circuit Analysis I	4 SHC			
ELC 138	DC Circuit Analysis	4 SHC			
ELC 139	AC Circuit Analysis	4 SHC			
***Engineering**					
Choose one:					
HYD 110	Hydraulics/Pneumatics I	3 SHC			
HYD 112	Hydraulics/Med/Heavy Duty	2 SHC			
HYD 115	Industrial Hydraulics	3 SHC			
MNT 165	Mechanical Industrial Sys	2 SHC			
***Motors and Controls**					
Choose one:					

ELC 117	Motors and Controls	4 SHC			
ELC 128	Intro to PLC	3 SHC			
***Specialty**					
Choose one:					
ATR 112	Intro to Automation	3 SHC			
CET 110	Intro to CET	1 SHC			
ELN 131	Analog Electronics I	4 SHC			
ISC 129	Qual Testing Lab Tech	3 SHC			
MEC 110	Intro to CAD/CAM	2 SHC			
PCI 150	Process Control Systems	4 SHC			
Automation Engineering Technology					
*ATR 112	Intro to Automation	3 SHC			
ATR 121	Intro to Machine Vision	4 SHC			
*ATR 215	Sensors and Transducers	3 SHC			
*ELC 128	Intro to PLC	3 SHC			
ELN 133	Digital Electronics	4 SHC			
PCI 171	Fieldbus Systems	4 SHC			
***Basic Electricity**					
Choose one set:					
ELC 131	Circuit Analysis I	4 SHC			
ELC 133	Circuit Analysis II	4 SHC			
OR					
ELC 138	DC Circuit Analysis	4 SHC			
ELC 139	AC Circuit Analysis	4 SHC			
Mechatronics Engineering Technology					
*ATR 112	Intro to Automation	3 SHC			
*ELC 213	Instrumentation	4 SHC			
***Basic Electricity**					
Choose one course or set:					
ELC 111	Intro to Electricity	3 SHC			
OR					
ELC 112	DC/AC Electricity	5 SHC			
OR					
ELC 131	Circuit Analysis I	4 SHC			
OR					
ELC 138	DC Circuit Analysis	4 SHC			
ELC 139	AC Circuit Analysis	4 SHC			
Drawing					
Choose one:					
DFT 119	Basic CAD	2 SHC			
DFT 151	CAD I	3 SHC			
DFT 154	Intro Solid Modeling	3 SHC			
DFT 170	Engineering Graphics	3 SHC			
EGR 120	Eng and Design Graphics	3 SHC			
ELC 132	Electrical Drawings	2 SHC			
Fluid Mechanics					
Choose one:					
HYD 110	Hydraulics/Pneumatics I	3 SHC			
HYD 180	Pneumatics in Automation	3 SHC			
MEC 265	Fluid Mechanics	3 SHC			
Mechanical Drives					
Choose one:					
MEC 130	Mechanisms	3 SHC			
MEC 275	Engineering Mechanisms	3 SHC			
Machines					
Choose one course or set:					
ELC 117	Motors and Controls	4 SHC			
ELC 130	Advanced Motors/Controls	3 SHC			

ELC 135	Electrical Machines I	3 SHC			
AND					
ELC 136	Electrical Machines II	4 SHC			
Programmable Logic Controllers					
Choose one:					
ELC 128	Intro to PLC	3 SHC			
ELN 260	Prog Logic Controllers	4 SHC			
***Physics**					
Choose one:					
PHY 131	Physics-Mechanics	4 SHC			
PHY 151	College Physics I	4 SHC			

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

AHR, ALT, ATR, BAT, BPM, BPR, BTB, BTC, BUS, CET, CEG, CHM, CIS, CIV, COE, CSC, CTI, CTS, DBA, DDF, DEA, DFT, EGR, ELC, ELN, FBG, GRA, HET, HYD, ISC, LOG, MAC, MAT, MCM, MEC, MKT, MNT, MPS, MLG, MSM, NET, NOS, OMT, PCI, PHY, PKG, RCT, RVM, SEC,SEL, SST, TRN, WEB and WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Engineering and Technology: Civil Engineering and Geomatics Technologies

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 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Civil Engineering Technology	CIP Code: 15.0201	AAS/Diploma/Certificate	A40140
Geomatics Technology	CIP Code: 15.1102	AAS/Diploma/Certificate	A40380
Geospatial Mapping Technology	CIP Code: 45.0702	AAS/Diploma/Certificate	A40XXX
Environmental Engineering Technology	CIP Code: 15.0507	AAS/Diploma/Certificate	A40XXX

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, 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:

Civil Engineering Technology: A course of study that prepares students to use basic engineering principles and technical skills to carry out planning, documenting and supervising tasks in sustainable land development and public works and facilities projects. Includes instruction in the communication and computational skills required for materials testing, structural testing, field and laboratory testing, site analysis, estimating, project management, plan preparation, hydraulics, environmental technology, and surveying. Graduates should qualify for technician-level jobs with both public and private engineering, construction, and surveying agencies.

Geomatics Technology: A course of study that prepares students to use mathematical and scientific principles for the delineation, determination, planning and positioning of land tracts, boundaries, contours and features applying principles of route surveying, construction surveying, photogrammetry, mapping, global positioning systems, geographical information systems, and other kinds of property description and measurement to create related maps, charts and reports. Includes instruction in applied geodesy, computer graphics, photointerpretation, plane and geodetic surveying, mensuration, traversing, survey equipment operation and maintenance, instrument calibration, and basic cartography. Graduates should qualify for jobs as survey party chief, instrument person, surveying technician, highway surveyor, mapper, GPS technician, and CAD operator. Graduates will be prepared to pursue the requirements necessary to become a Registered Land Surveyor in North Carolina.

Geospatial Mapping Technology: A course of study that prepares students to use mathematical and scientific principles for calculating, drawing, and verifying accuracy of mapmaking parameters which includes analysis of large amounts of geographic data through map making software. Includes instruction in cartographic theory and map projections, computer-assisted cartography, geographic information systems, map design and layout,

**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.*

photogrammetry, air photo interpretation, remote sensing, spatial analysis, geodesy, cartographic editing, and applications to specific industrial, commercial, research, and governmental mapping problems. Graduates should find employment as mapping assistants, cartography assistants, field technicians and remote sensing assistants in engineering firms, local, state and federal government.

Environmental Engineering Technology: A course of study that prepares students to use mathematical and scientific principles to modify, test, and operate equipment and devices used in the prevention, control and remediation of environmental problems and development of environmental remediation devices. Includes instruction in environmental safety principles, environmental standards, testing and sampling procedures, laboratory techniques, instrumentation calibration, safety and protection procedures, equipment maintenance, and report preparation.

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Engineering and Technology: Civil Engineering and Geomatics Technologies

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.						
Communications:				**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC			
COM	110	Introduction to Communication	3 SHC			
COM	120	Intro Interpersonal Com	3 SHC			
COM	231	Public Speaking	3 SHC			
*ENG	101	Applied Communications I	3 SHC			
*ENG	102	Applied Communications II	3 SHC			
ENG	110	Freshman Composition	3 SHC			
ENG	111	Expository Writing	3 SHC			
ENG	114	Professional Research & Reporting	3 SHC			
ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:				**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC			
HUM	110	Technology and Society	3 SHC			
HUM	115	Critical Thinking	3 SHC			
HUM	230	Leadership Development	3 SHC			
PHI	230	Introduction to Logic	3 SHC			
PHI	240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:				**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC			
ECO	251	Prin of Microeconomics	3 SHC			
GEO	110	Introduction to Geography	3 SHC			
GEO	111	World Regional Geography	3 SHC			
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:			
MAT 120 Geometry and Trigonometry 3 SHC	**3 SHC**	**0-3 SHC**	**Optional**
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			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Engineering and Technology: Civil Engineering and Geomatics Technologies	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**29-31 SHC**		
CEG 211 Hydrology & Erosion Control 3 SHC			
SRV 110 Surveying I 4 SHC			
Introduction to Engineering Technology			
Choose one:			
CEG 115 Intro to Tech & Sustainability 3 SHC			
EGR 115 Intro to Technology 3 SHC			
Computer Aided Drafting			
Choose one:			
CEG 151 CAD for Engineering Technology 3 SHC			
DFT 151 CAD I 3 SHC			
EGR 120 Eng and Design Graphics 3 SHC			
Spatial Data Collection and Mapping			
Choose one:			
CEG 111 Intro to GIS and GNSS 4 SHC			
OR			
GIS 111 Introduction to GIS 3 SHC			
AND			
GIS 112 Introduction to GPS 3 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.

Civil Engineering Technology

CEG 212	Introduction to Environmental Tech	3 SHC
CEG 210	Construction Mtls & Methods	3 SHC
CIV 111	Soils and Foundations	4 SHC
SRV 111	Surveying II	4 SHC

Choose one:

EGR 250	Statics & Strength of Materials	5 SHC
EGR 251	Statics	3 SHC
MEC 210	Applied Mechanics	3 SHC

Choose one set :

CEG 235	Project Management & Estimating	3 SHC
CIV 230	Construction Estimating	3 SHC
AND		
CIV 240	Project Management	3 SHC
CST 242	Planning/Estimating II	4 SHC

Geomatics Technology

CEG 230	Subdivision Planning & Design	3 SHC
SRV 111	Surveying II	4 SHC
SRV 210	Surveying III	4 SHC
SRV 220	Surveying Law	3 SHC
SRV 240	Topo/Site Surveying	4 SHC

Geospatial Mapping Technology

GIS 121	Georeferencing & Mapping	3 SHC
GIS 231	Geo Position Sys Methods	3 SHC
GIS 246	Prin of Property Mapping	3 SHC

Choose one:

DBA 110	Database Concepts	3 SHC
GIS 232	Spatial Databases	3 SHC

Choose one:

CIS 115	Intro to Prog & Logic	3 SHC
GIS 161	Intro to Comp/BASIC & C+ +	3 SHC
GIS 261	Programming in GIS	3 SHC
CSC 133	C Programming	3 SHC
CSC 134	C+ + Programming	3 SHC
CSC 153	C# Programming	3 SHC

Environmental Engineering Technology

CEG 212	Intro to Environmental Tech	3 SHC
CEG 230	Subdivision Planning & Design	3 SHC
CIV 111	Soils and Foundations	3 SHC
ENV 226	Environmental Law	3 SHC
CHM 151	General Chemistry I	4 SHC

Choose one:

EGR 250	Statics & Strength of Materials	5 SHC
EGR 251	Statics	3 SHC
MEC 210	Applied Mechanics	3 SHC

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

ALT, BIO, CEG, CHM, CIS, CIV, COE, CSC, CST, CTI,DBA,DFT, EGR, ENV,FOR, GIS, LID, MAT, MEC, PHY,SRV,SST

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Engineering and Technology: Drafting Technology

Career Cluster: Science, Technology, Engineering and 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 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code			Credential Level(s) Offered	Program Major Code
Mechanical Drafting Technology	CIP Code	15.1306	AAS/Diploma/Certificate	A50340
Computer-Aided Drafting Technology	CIP Code	15.1302	AAS/Diploma/Certificate	A50150

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, engineering technicians, CAD systems managers, industrial and technology managers, research technicians and graphic 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:

Mechanical Drafting Technology: A course of study that prepares the students to apply technical skills and advanced computer software and hardware to create working drawings, graphic representations and computer simulations for mechanical and industrial designs. Includes instruction in engineering graphics, specification interpretation, geometric dimensioning and tolerancing, drafting calculations, two dimensional and three dimensional engineering design, solids modeling, engineering animation, computer-aided drafting (CAD), computer-aided design (CADD)and manufacturing materials and processes. Graduates should qualify for employment in mechanical areas such as manufacturing, fabrication, research and development, and service industries.

Computer-Aided Drafting Technology: A course of study that prepares the students to apply technical skills and advanced computer software and hardware to develop plans and related documentation, and manage the hardware and software of a CAD system. Includes instruction in architectural drafting, computer-assisted drafting and design (CADD), creating and managing two and three-dimensional models, linking CAD documents to other software applications, and operating systems. Graduates should qualify for CAD jobs in architectural and engineering consulting firms and industrial design businesses.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Engineering and Technology: Drafting 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.						
Communications:				**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC			
COM	110	Introduction to Communication	3 SHC			
COM	120	Intro Interpersonal Com	3 SHC			
COM	231	Public Speaking	3 SHC			
*ENG	101	Applied Communications I	3 SHC			
*ENG	102	Applied Communications II	3 SHC			
ENG	110	Freshman Composition	3 SHC			
ENG	111	Expository Writing	3 SHC			
ENG	114	Professional Research & Reporting	3 SHC			
ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:				**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC			
HUM	110	Technology and Society	3 SHC			
HUM	115	Critical Thinking	3 SHC			
HUM	230	Leadership Development	3 SHC			
PHI	230	Introduction to Logic	3 SHC			
PHI	240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:				**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC			
ECO	251	Prin of Microeconomics	3 SHC			
GEO	110	Introduction to Geography	3 SHC			
GEO	111	World Regional Geography	3 SHC			
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	101	Applied Mathematics I	3 SHC			
MAT	110	Mathematical Measurement	3 SHC			
MAT	115	Mathematical Models	3 SHC			
MAT	120	Geometry and Trigonometry I	3 SHC			
MAT	121	Algebra/Trigonometry	3 SHC			
PHY	110	Conceptual Physics	3 SHC			
PHY	121	Applied Physics I	4 SHC			

*Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Engineering and Technology: Drafting Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
*Courses required for a diploma are designated with **	**24 SHC**	**14-16 SHC**	

A. Technical Core:

*DFT 151	CAD I	3 SHC
*DFT 152	CAD II	3 SHC
DFT 153	CAD III	3 SHC
*DFT 154	Intro Solid Modeling	3 SHC
OR		
*DDF 252	Advanced Solid Modeling	3 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.

Mechanical Drafting Technology

*DFT 111	Technical Drafting I	2 SHC
*DFT 112	Technical Drafting II	2 SHC

**Choose one:*

MEC 110	Intro to CAD/CAM	2 SHC
MEC 111	Machine Processes I	3 SHC
MEC 130	Mechanisms	3 SHC
MEC 180	Engineering Materials	3 SHC

Computer Aided Drafting Technology

*DFT 253	CAD Data Management	3 SHC
OR		
*DFT 254	Interm Solid Model/Render	3 SHC

**Choose one:*

DFT 111	Technical Drafting I	2 SHC
DFT 170	Engineering Graphics	3 SHC
ARC 111	Intro to Arch Technology	3 SHC
DDF 221	Design Drafting Project	2 SHC

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

ALT, ARC,ART, ATR, BAT,BPR, BUS, CEG, CET, CIS, CIV, COE, CSC, CST, CTI,CTS, DBA, DDF, DFT, EGR, GIS, HYD, INT, ISC, LAR, MAC, MEC, MNT, OMT, SRV and SST

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

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 2013 (2013*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.*

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.

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

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.						
Communications:				**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC			
COM	110	Introduction to Communication	3 SHC			
COM	120	Intro Interpersonal Com	3 SHC			
COM	231	Public Speaking	3 SHC			
*ENG	101	Applied Communications I	3 SHC			
*ENG	102	Applied Communications II	3 SHC			
ENG	110	Freshman Composition	3 SHC			
ENG	111	Expository Writing	3 SHC			
ENG	114	Professional Research & Reporting	3 SHC			
ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:				**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC			
HUM	110	Technology and Society	3 SHC			
HUM	115	Critical Thinking	3 SHC			
HUM	230	Leadership Development	3 SHC			
PHI	230	Introduction to Logic	3 SHC			
PHI	240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:				**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC			
ECO	251	Prin of Microeconomics	3 SHC			
GEO	110	Introduction to Geography	3 SHC			
GEO	111	World Regional Geography	3 SHC			
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			

*Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester 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			

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	Networking Basics	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	Networking Basics	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, COE, 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,WEB,WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Engineering and Technology: Geospatial 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 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Geospatial Technology	CIP Code: 45.0702	AAS/Diploma/Certificate	A40220

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, process improvement technicians, engineering technicians, construction technicians, 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:

Geospatial Technology: A course of study that prepares students to use technical skills and advanced computer hardware and software for programming, database management and internet applications using geographic data and geographic information systems. Includes instruction in mathematics, computer-assisted cartography, geographic information systems, map design and layout, photogrammetry, air photo interpretation, remote sensing, spatial analysis, geodesy, cartographic editing, global navigation satellite system technology and applications to specific industrial, commercial, research, and governmental mapping problems. Graduates should find employment as field technicians or as database and mapping assistants.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Engineering and Technology: Geospatial 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 not be included in associate degree programs.*

				AAS	Diploma	Certificate
Communications:				**6 SHC**	**3-6 SHC**	**Optional**
*COM	101	Workplace Communication	3 SHC			
COM	110	Introduction to Communication	3 SHC			
COM	120	Intro Interpersonal Com	3 SHC			
COM	231	Public Speaking	3 SHC			
*ENG	101	Applied Communications I	3 SHC			
*ENG	102	Applied Communications II	3 SHC			
ENG	110	Freshman Composition	3 SHC			
ENG	111	Expository Writing	3 SHC			
ENG	114	Professional Research & Reporting	3 SHC			
ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:				**3 SHC**	**0-3 SHC**	**Optional**
*HUM	101	Values in the Workplace	2 SHC			
HUM	110	Technology and Society	3 SHC			
HUM	115	Critical Thinking	3 SHC			
HUM	230	Leadership Development	3 SHC			
PHI	230	Introduction to Logic	3 SHC			
PHI	240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:				**3 SHC**	**0-3 SHC**	**Optional**
ECO	151	Survey of Economics	3 SHC			
ECO	251	Prin of Microeconomics	3 SHC			
GEO	110	Introduction to Geography	3 SHC			
GEO	111	World Regional Geography	3 SHC			
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			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Engineering and Technology: Geospatial Technology	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
*Courses required for a diploma are designated with **	**15 SHC**	**15 SHC**	

A. Technical Core:

*GIS111	Introduction to GIS	3 SHC
*GIS121	Georeferencing & Mapping	3 SHC
**Choose one of the groups*:		
GIS 112	Introduction to GPS	3 SHC
GIS 245	Intro to Spatial Analysis	3 SHC
GIS 255	Advanced Spatial Analysis	3 SHC
	OR	
GIS 120	Introduction to Geodesy	3 SHC
GIS 125	CAD for GIS	3 SHC
GIS 240	Air Photo Interpretation	3 SHC

B. Program Major(s): Not Applicable

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

BUS, CEG, CET, CIS, CIV, COE, CSC, CTI, CTS, DBA, DEA, DFT, EGR, ENV, FOR, GEO, GIS, MAT, NET, NOS, PHY, SEC, SGD, SST, SRV, and WEB

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Engineering and Technology: Mechanical 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 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Mechanical Engineering Technology	CIP Code: 15.0805	AAS/Diploma/Certificate	A40320

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, 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:

Mechanical Engineering Technology: A course of study that prepares the students to use basic engineering principles and technical skills to design, develop, test, and troubleshoot projects involving mechanical systems. Includes instruction in principles of mechanics, applications to specific engineering systems, design testing procedures, prototype and operational testing and inspection procedures, manufacturing system-testing procedures, test equipment operation and maintenance, computer applications, critical thinking, planning and problem solving, and oral and written communications. Graduates of the curriculum will find employment opportunities in the manufacturing or service sectors of engineering technology. Engineering technicians may obtain professional certification by application to organizations such as ASQC, SME, and NICET.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Engineering and Technology: Mechanical 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.					
Communications:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 114	Professional Research & Reporting	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social/Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
GEO 110	Introduction to Geography	3 SHC			
GEO 111	World Regional Geography	3 SHC			
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			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core.

Engineering and Technology: Mechanical Engineering Technology			**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:			**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:			**21-24 SHC**		
Engineering Fundamentals					
Choose five (5) hours minimum:					
EGR 250	Statics and Strength of Mat	5 SHC			
EGR 251	Statics	3 SHC			
AND					
EGR 252	Strength of Materials	3 SHC			
Two-Dimensional Drawing					
Choose one:					
DFT 151	CAD I	3 SHC			
DFT 170	Engineering Graphics	3 SHC			
EGR 120	Eng and Design Graphics	3 SHC			
Three-Dimensional Drawing					
Choose one:					
DFT 153	CAD III	3 SHC			
DFT 154	Intro Solid Modeling	3 SHC			
Fluid Mechanics					
Choose one:					
HYD 110	Hydraulics/Pneumatics I	3 SHC			
HYD 180	Pneumatics in Automation	3 SHC			
MEC 265	Fluid Mechanics	3 SHC			
Manufacturing					
Choose three (3) hours minimum:					
MEC 145	Mfg Materials I	3 SHC			
MEC 161	Manufacturing Processes I	3 SHC			
AND					
MEC 180	Engineering Materials	3 SHC			
Physics					
Choose one:					
PHY 131	Physics – Mechanics	4 SHC			
PHY 151	College Physics I	4 SHC			
B. Program Major(s): Not applicable					

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

ALT, ARC, ATR, BAT, BMT, BPR, BTC, BUS, CEG, CET, CIS, CMT, CTI, CTS, COE, CHM, CIV, CSC, DBA, DDF, DEA, DFT, EGR, ELC, ENV, ELN, EPP, FBG, FMW, GIS, HYD, IMS, ISC, ITN, LEO, LOG, MAC, MAT, MEC, MLG, MNT, NAN, NDE, NET, NOS, NUC, OMT, OSS, PCI, PHY, PLA, PMT, PPT, RCT, SST, TCT, TNE, WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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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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**

Curriculum Standard for Science and Math: Biotechnology

Career Cluster: Science, Technology, Engineering, and Math **

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

Pathway: Science and Mathematics | **Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Agricultural Biotechnology	CIP Code 26.0308	AAS/Diploma/Certificate	A20110
Biotechnology	CIP Code: 26.1201	AAS/Diploma/Certificate	A20100
Environmental Biotechnology	CIP Code: 40.0509	AAS/Diploma/Certificate	A201XX
Laboratory Technology	CIP Code: 41.0101	AAS/Diploma/Certificate	A20160
Marine Biotechnology	CIP Code: 26.1304	AAS/Diploma/Certificate	A201XX

Pathway Description:

The Biotechnology curriculum, which has emerged from molecular biology and chemical engineering, is designed to meet the increasing demands for skilled laboratory technicians in various fields of biological and chemical technology.
x
Course work emphasizes biology, chemistry, mathematics, and technical communications. The curriculum objectives are designed to prepare graduates to serve in three distinct capacities: research assistant to a biologist or chemist, laboratory technician/instrumentation technician, and quality control/quality assurance technician.

Graduates should be qualified for employment in various areas of industry and government, including research and development, manufacturing, sales, and customer service.

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

Agricultural Biotechnology: A program that focuses on the application of molecular biology, biochemistry, and biophysics to the study of biomolecular structures, functions, and processes specific to plants and plant substances. Potential course work includes instruction in the biochemistry of plant cells, nuclear-cytoplasmic interactions, molecular cytostructures, photosynthesis, plant molecular genetics, and the molecular biology of plant diseases.

Biotechnology: A program that focuses on the application of the biological sciences, biochemistry, and genetics to the preparation of new and enhanced agricultural, environmental, clinical, and industrial products, including the commercial exploitation of microbes, plants, and animals. Potential course work includes instruction in general biology, general and organic chemistry, physics, biochemistry, molecular biology, immunology, microbiology, genetics, and cellular biology.

Environmental Biotechnology: A program that focuses on the scientific study of natural systems (air, water, and soil) through the use of chemical techniques and instrumentation, with an emphasis on the movement and fate of pollutants and chemical aspects of contaminant remediation. Potential course work includes instruction in analytical, inorganic, organic, and physical chemistry; aquatic, soil, and atmospheric chemistry; environmental engineering; environmental toxicology; and analytical methods.

Laboratory Technology: A program that prepares individuals to apply scientific principles and technical skills in support of biologists and biotechnologists in research, industrial, and government settings. Potential course work includes instruction in fermentation technology, cell culturing, protein purification, biologic synthesis, assaying and testing, quality control, industrial microbiology, bioprocessing, chromatography and bioseparation, genetic technology, laboratory and hazardous materials safety, and computer applications.

Marine Biotechnology: A program that focuses on the scientific study of the ecology and behavior of microbes, plants, and animals inhabiting aquatic environments. Potential course work includes instruction in geology and hydrology; aquatic ecosystems; microbiology; mycology; botany; ichthyology; mammalogy; population biology and biodiversity; studies of specific species, phyla, and habitats; and applications to fields such as natural resources conservation, fisheries science, and biotechnology.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Science and Math: Biotechnology

Recommended 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.				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
BIO 175 General Microbiology	3 SHC			
BIO 275 Microbiology	4 SHC			
CHM 131 Introduction to Chemistry	3 SHC			
CHM 131A Intro to Chemistry Lab	1 SHC			
CHM 151 General Chemistry I	4 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			

Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.

MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Science and Math: Biotechnology		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:				
BIO 111 General Biology I	4 SHC	**24-35 SHC**	**12-23 SHC**	
BIO 112 General Biology II	4 SHC			
CHM 132 Organic and Biochemistry	4 SHC			
B. Program Major(s).				
Agricultural Biotechnology				
*BIO 280 Biotechnology	3 SHC			
*BTC 150 Bioethics	3 SHC			
*BTC 285 Cell Culture	3 SHC			
*Agriculture. Select 6 SHC:				
AGR 160 Plant Science	3 SHC			
AGR 261 Agronomy	3 SHC			
ANS 110 Animal Science	3 SHC			
ANS 150 Animal Health Management	3 SHC			
HOR 134 Greenhouse Operations	3 SHC			
HOR 168 Plant Propagation	3 SHC			
AGR 170 Soil Science	3 SHC			
*Courses required for the Agricultural Biotechnology diploma are designated with *				

B. Program Major(s) (Continued)

Biotechnology

+ Biotechnology Lab. Choose one.

BTC 181	Basic LabTechniques	4 SHC
BTC 288	Biotech Lab Experience	2 SHC

+ Microbiology. Choose one.

BIO 175	General Microbiology	3 SHC
BIO 275	Microbiology	4 SHC
BTC 275	Industrial Microbiology	4 SHC

+ Chemistry. Choose one:

CHM 131	Introduction to Chemistry	3 SHC *and*
CHM 131A	Introduction to Chemistry Lab	1 SHC
CHM 151	General Chemistry I	4 SHC

+ Genetics. Choose one:

BIO 250	Genetics	4 SHC
BTC 250	Principles of Genetics	3 SHC

Courses required for the Biotechnology diploma are designated with +

Environmental Biotechnology

Biotechnology Lab. Choose one.

BTC 181	Basic LabTechniques	4 SHC
BTC 288	Biotech Lab Experience	2 SHC

Microbiology. Choose one.

BIO 175	General Microbiology	3 SHC
BIO 275	Microbiology	4 SHC
BTC 275	Industrial Microbiology	4 SHC

Chemistry. Choose one:

CHM 131	Introduction to Chemistry	3 SHC *and*
CHM 131A	Introduction to Chemistry Lab	1 SHC
CHM 151	General Chemistry I	4 SHC

Environment. Choose one:

ENV 214	Water Quality	4 SHC
ENV 218	Environmental Health	3 SHC

Science. Choose one:

ENV 110	Environmental Science	3 SHC
BIO 140	Environmental Biology	3 SHC

Waste Management. Choose one:

ENV 210	Management of Waste	4 SHC
BIO 240	Waste Management	3 SHC

Courses required for the Environmental Biotechnology diploma are designated with #

B. Program Major(s) (Continued)

Laboratory Technology

LBT	110 Laboratory Methods I	5 SHC
LBT	125 Lab Instrumentation	2 SHC
LBT	210 Laboratory Methods II	5 SHC
LBT	250 Laboratory Methods III	5 SHC

A Laboratory Technology diploma requires a minimum of 12 SHC selected from the Laboratory Technology program major

Marine Biotechnology

Select a minimum of 12 SHC from the following courses for the Marine Biotechnology AAS program:

AQU	215 Algae Culture	3 SHC
AQU	230 Fish Genetics & Breeding	3 SHC
AQU	255 Invert Culture	3 SHC
BTC	260 Marine Biotechnology	4 SHC
BTC	181 Basic LabTechniques	4 SHC

A Marine Biotechnology diploma requires a minimum of 12 SHC extracted from the required technical/program major core of the AAS degree.

C. Other Major Hours.

T*o be selected from the following prefixes:*

ACC, AGR, ALT, ANS, AQU, BIO, BTC, BUS, CHM, CIS, CIV, COE, COM, CSC, CTC, EHS, ENV, FOR, GEL, GIS, HEA, HOR, ISC, LBT, LID, MAT, MSC, NAN, PHS, PHY, SCI, SST, WAT, WEB, and VEN

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Science and Math: Environmental Science Technology

Career Cluster: Science, Technology, Engineering, and Math **

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

Pathway: Science and Mathematics | **Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Environmental Management Technology	CIP Code 03.0101	AAS/Diploma/Certificate	A2014X
Environmental Science Technology	CIP Code: 03.0103	AAS/Diploma/Certificate	A20140
Invasive Species Management Technology	CIP Code: 03.0204	AAS/Diploma/Certificate	A2014X

Pathway Description:

The Environmental Science Technology curriculum is designed to prepare individuals for employment in environmental testing, consulting, remediation, and related industries. Major emphasis is placed on biological and chemical evaluation of societal impact and sustainable management of the environment. Coursework includes optional emphasis in invasive species treatment, and management of the environment.

Coursework includes computer applications, biology, chemistry, industrial safety, water quality, environmental health, and waste management. Coursework specific for Invasive Species includes assessment, management, identification, and control of both invasive plants and animals and GIS/GPS. Coursework specific for Environmental Management includes land resource management, field sampling and analysis, environmental health pathogens, and rural watershed protection.

Graduates are prepared for employment opportunities with numerous positions within the industry. Employment opportunities include, but not limited to, the following: Chemical and Biological Analysis, Water and Wastewater Treatment, EPA Compliance, Hazardous Material Handling, Contaminated Site Assessment and Remediation, Federal, State, and Local land management agencies, Private conservation organizations, Environmental Regulatory Compliance and Enforcement.

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

Environmental Management Technology: A general program that focuses on the studies and activities relating to the natural environment and its conservation, use, and improvement. Potential course work includes instruction in subjects such as climate, air, soil, water, land, fish and wildlife, and plant resources; in the basic principles of environmental science and natural resources management; and the recreational and economic uses of renewable and nonrenewable natural resources.

Environmental Science Technology: A program that focuses on environment-related issues using scientific, social scientific, or humanistic approaches or a combination. Potential course work includes instruction in the basic principles of ecology and environmental science and related subjects such as policy, politics, law, economics, social aspects, planning, pollution control, natural resources, and the interactions of human beings and nature.

Invasive Species Management Technology: A program that focuses on the application of economic concepts and methods to the analysis of issues such as air and water pollution, land use planning, waste disposal, invasive species and pest control, conservation policies, and related environmental problems. Potential course work includes instruction in cost-benefit analysis, environmental impact assessment, evaluation and assessment of alternative resource management strategies, policy evaluation and monitoring, and descriptive and analytic tools for studying how environmental developments affect the economic system.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Science and Math: Environmental Science

Recommended 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 not be included in associate degree programs.*				
Communication:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication	3 SHC			
COM 110 Introduction to Communication	3 SHC			
COM 120 Intro Interpersonal Com	3 SHC			
COM 231 Public Speaking	3 SHC			
*ENG 101 Applied Communications I	3 SHC			
*ENG 102 Applied Communications II	3 SHC			
ENG 110 Freshman Composition	3 SHC			
ENG 111 Expository Writing	3 SHC			
ENG 112 Argument-Based Research	3 SHC			
ENG 114 Prof Research & Reporting	3 SHC			
ENG 115 Oral Communication	3 SHC			
ENG 116 Technical Report Writing	3 SHC			
Humanities/Fine Arts:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace	2 SHC			
HUM 110 Technology and Society	3 SHC			
HUM 115 Critical Thinking	3 SHC			
HUM 230 Leadership Development	3 SHC			
PHI 230 Introduction to Logic	3 SHC			
PHI 240 Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics	3 SHC			
ECO 251 Prin of Microeconomics	3 SHC			
GEO 110 Introduction to Geography	3 SHC			
GEO 111 World Regional Geography	3 SHC			
*PSY 101 Applied Psychology	3 SHC			
*PSY 102 Human Relations	2 SHC			
PSY 118 Interpersonal Psychology	3 SHC			
PSY 135 Group Processes	3 SHC			
PSY 150 General Psychology	3 SHC			
*SOC 105 Social Relationships	3 SHC			
SOC 210 Introduction to Sociology	3 SHC			
SOC 215 Group Processes	3 SHC			
Natural Sciences/Mathematics:		**3 SHC**	**0-3 SHC**	**Optional**
BIO 140 Environmental Biology	3 SHC			
BIO 160 Introductory Life Science	3 SHC			
*MAT 101 Applied Mathematics I	3 SHC			
MAT 110 Mathematical Measurement	3 SHC			
MAT 115 Mathematical Models	3 SHC			
MAT 120 Geometry and Trigonometry	3 SHC			
MAT 121 Algebra/Trigonometry I	3 SHC			
MAT 140 Survey of Mathematics	3 SHC			
MAT 151 Statistics I	3 SHC			
MAT 155 Statistical Analysis	3 SHC			
PHY 110 Conceptual Physics	3 SHC			
PHY 121 Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Science and Math: Environmental Science Technology		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:				
*ENV 218 Environmental Health	3 SHC	**28-36 SHC**	**14-18 SHC**	
*Biology. Choose one:				
BIO110 Principles of Biology	4 SHC			
BIO111 General Biology I	4 SHC			
*Chemistry. Choose one:				
CHM131 Introduction to Chemistry	3 SHC			
CHM151 General Chemistry I	4 SHC			
*Science. Choose one:				
BIO 140 Environmental Biology	3 SHC			
ENV110 Environmental Science	3 SHC			
Water Quality. Choose one:				
ENV214 Water Quality	4 SHC			
WAT110 Basic Water Trmt	3 SHC			
B. Program Major(s):				
Environmental Management				
+ENV 224 Land Resource Management	4 SHC			
+ENV 240 Field Sampling & Analysis	3 SHC			
+ENV 250 Rural Watershed Protection	4 SHC			
+ENV 255 Envir/Public Hth.Pathogen	4 SHC			
Courses required for the Environmental Management diploma are designated with +				

B. Program Majors (Continued)

Environmental Science Technology

Waste Management. Choose one:

ENV	210 Management of Waste	4 SHC
BIO	240 Waste Management	3 SHC

* Safety. Choose one:

ISC	112 Industrial Safety	2 SHC
ISC	121 Environmental Health & Safety	3 SHC
EHS	114 OSHA Regulations	4 SHC

Select additional courses from the BIO, ENV, EHS, or ISC prefix for a minimum of 12 SHC for the Environmental Science Technology AAS program:

*Courses required for the Environmental Science Technology Diploma are designated with **

Invasive Species Management

GIS	110 Survey of GIS/GPS	1 SHC
IVS	110 Intro to Invasive Species	3 SHC
#IVS	210 Inv Species Mgmt Strat	3 SHC
#IVS	211 Inv Species Mgmt Programs	3 SHC
#IVS	260 State License Exam Prep	1 SHC

\# Select one set:

IVS	220 Inv Plant Survey Methods	4 SHC
IVS	221 Inv Plant Control Methods	3 SHC
	or	
IVS	230 Aq Nuisance Survey Meth	4 SHC
IVS	231 Aq Nuisance Control Meth	3 SHC
	or	
IVS	240 Insct/Dis Survey Methods	4 SHC
IVS	241 Insct/Dis Control Methods	3 SHC
	or	
IVS	250 Inj Wildlife Survey Meth	4 SHC
IVS	251 Inj Wildlife Control Meth	3 SHC

Courses required for the Invasive Species Management Diploma are designated with #

C. Other Major Hours.

T*o be selected from the following prefixes:*

AGR, ALT, ANS, ARC, AST, BIO, BPM, BTC, BUS, CHM, CIS, CIV, COE, CMT, CSC, CST, CTS, DFT, EGR, EHS, ELC, ELN, ENV, ETR, FOR, FWL, GEL, GEO, GIS, HOR, HYD, ISC, IVS, LAR, LID, MAT, MSC, PHS, PHY, PTC, SRV, SST, VEN, WAT, WLD, and ZAS.

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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.

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

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

Curriculum Standard for Science and Math: Zoo and Aquarium Science Technology

Career Cluster: Science, Technology, Engineering, and Math **

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

Pathway: Science and Mathematics

Effective Term: Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Zoological Science Technology	CIP Code 26.0709	AAS/Diploma/Certificate	A2022X
Aquarium Science Technology	CIP Code: 26.0799	AAS/Diploma/Certificate	A2022X

Pathway Description:

The Science and Math curriculum prepares students for employment in zoological parks, aquaria, or other settings requiring animal care, breeding, education/conservation, or health of exotic animals.

Course work emphasizes anatomy, physiology, reproduction, behavior, and nutrition of exotic animals that are on exhibit for education and/or conservation purposes or for animals maintained for medical purposes. Students have practical experiences with basic husbandry skills, animal handling/capture/restraint skills, the ability to detect illness, and creative design of exhibits.

Graduates of the curriculum should qualify for entry-level employment opportunities in a variety of settings, including zoos, aquaria, nature science centers, and animal research facilities.

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

Zoo Science Technology: A program that focuses on the application of biological principles to the study of vertebrate wildlife, wildlife habitats, and related ecosystems in remote and urban areas. Potential course work includes instruction in animal ecology; adaptational biology; urban ecosystems; natural and artificial habitat management; limnology; wildlife pathology; and vertebrate zoological specializations such as mammalogy, herpetology, ichthyology, ornithology, and others.

Aquarium Science Technology: A program that prepares individuals to conserve and manage wilderness areas and the flora, marine and aquatic life therein, and manage wildlife reservations and zoological/aquarium facilities for recreational, commercial, and ecological purposes. Potential course work includes instruction in wildlife biology, marine/aquatic biology, freshwater and saltwater ecosystems, the design and operation of natural and artificial wildlife habitats, limnology, wildlife pathology, and vertebrate zoological specializations such as mammalogy, herpetology, ichthyology, ornithology, and others.

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Science and Math: Zoo and Aquarium Science Technology

Recommended 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.					
Communication:			**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC			
COM 110	Introduction to Communication	3 SHC			
COM 120	Intro Interpersonal Com	3 SHC			
COM 231	Public Speaking	3 SHC			
*ENG 101	Applied Communications I	3 SHC			
*ENG 102	Applied Communications II	3 SHC			
ENG 110	Freshman Composition	3 SHC			
ENG 111	Expository Writing	3 SHC			
ENG 112	Argument-Based Research	3 SHC			
ENG 114	Prof Research & Reporting	3 SHC			
ENG 115	Oral Communication	3 SHC			
ENG 116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:			**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC			
HUM 110	Technology and Society	3 SHC			
HUM 115	Critical Thinking	3 SHC			
HUM 230	Leadership Development	3 SHC			
PHI 230	Introduction to Logic	3 SHC			
PHI 240	Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:			**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC			
ECO 251	Prin of Microeconomics	3 SHC			
GEO 110	Introduction to Geography	3 SHC			
GEO 111	World Regional Geography	3 SHC			
*PSY 101	Applied Psychology	3 SHC			
*PSY 102	Human Relations	2 SHC			
PSY 118	Interpersonal Psychology	3 SHC			
PSY 135	Group Processes	3 SHC			
PSY 150	General Psychology	3 SHC			
*SOC 105	Social Relationships	3 SHC			
SOC 210	Introduction to Sociology	3 SHC			
SOC 215	Group Processes	3 SHC			
Natural Sciences/Mathematics:			**3 SHC**	**0-3 SHC**	**Optional**
BIO 140	Environmental Biology	3 SHC			
BIO 160	Introductory Life Science	3 SHC			
*MAT 101	Applied Mathematics I	3 SHC			
MAT 110	Mathematical Measurement	3 SHC			
MAT 115	Mathematical Models	3 SHC			
MAT 120	Geometry and Trigonometry	3 SHC			
MAT 121	Algebra/Trigonometry I	3 SHC			
MAT 140	Survey of Mathematics	3 SHC			
MAT 151	Statistics I	3 SHC			
MAT 155	Statistical Analysis	3 SHC			
PHY 110	Conceptual Physics	3 SHC			
PHY 121	Applied Physics I	4 SHC			

*Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Science and Math: Zoo and Aquarium Science		**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:		**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:		**30 SHC**		
BIO 111 General Biology I	4 SHC			
BIO 112 General Biology II	4 SHC			
ZAS 112 Intro to Zoo and Aquarium Science	1 SHC			
ZAS 113 Animal Exhibits	1 SHC			
ZAS 120 Zoonotic Diesases	2 SHC			
ZAS 130 Introduction to Ethology	3 SHC			
ZAS 234 Zoo Herpetology	3 SHC			
B. Program Major(s).				
Zoological Science				
Select a minimum of 12 SHC from the following courses for the Zoological Science AAS program:				
ZAS 110 Intro to Zookeeping	5 SHC			
ZAS 131 Applied Animal Psych	3 SHC			
ZAS 232 Zoo Invertebrates	3 SHC			
ZAS 235 Zoo Ornithology	3 SHC			
ZAS 236 Zoo Mammalogy	3 SHC			
Aquarium Science				
Select a minimum of 12 SHC from the following courses for the Aquarium Science AAS program:				
BIO 243 Marine Biology	3 SHC			
MSC 174 Marine Invertebrate Zoo	4 SHC			
ZAS 210 Intro to Aquarium Science	1 SHC			
ZAS 233 Zoo Ichthyology	3 SHC			
ZAS 234 Zoo Herpetology	3 SHC			
ZAS 243 Prin of Aquarium Science	3 SHC			
ZAS 272 Aquatic Pathophysiology	3 SHC			

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

ACC, AGR, ANS, ARC, BIO, BTC, BUS, CHM, CIS, COE, CSC, CST, CUL, DFT, ECO, ETR, FOR, GCM, GIS, HET, HOR, IVS, LAR, LID, LSG, MSC, SEL, SST, TRF, VEN and ZAS

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Sustainability Technologies

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

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

Pathway: Engineering and Technology	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Sustainability Technologies	CIP Code: 15.0503	AAS/Diploma/Certificate	A40370

Pathway Description:

The Sustainability Technologies curriculum is designed to prepare individuals for employment in environmental, construction, renewable energy, or related industries, where key emphasis is placed on energy production and waste reduction along with sustainable technologies.

Course work includes renewable energy, green building technology, and environmental technologies. Additional topics may include sustainability, energy management, waste reduction, renewable energy, site assessment, and environmental responsibility.

Graduates should qualify for positions within the renewable energy, construction, and/or environmental industries. Employment opportunities exist in both the government and private industry sectors where graduates may function as renewable energy technicians, sustainability consultants, environmental technicians, or green building supervisors.

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:***

N/A

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

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Sustainability Technologies

Recommended 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.				
Communications:		**6 SHC**	**3-6 SHC**	**Optional**
*COM 101	Workplace Communication	3 SHC		
COM 110	Introduction to Personal Communications	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:		**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101	Values in the Workplace	2 SHC		
HUM 110	Technology and Society	3 SHC		
HUM 115	Critical Thinking	3 SHC		
HUM 230	Leadership Development	3 SHC		
PHI 230	Introduction to Logic	3 SHC		
PHI 240	Introduction to Ethics	3 SHC		
Social/Behavioral Sciences:		**3 SHC**	**0-3 SHC**	**Optional**
ECO 151	Survey of Economics	3 SHC		
ECO 251	Prin of Microeconomics	3 SHC		
GEO 110	Introduction to Geography	3 SHC		
GEO 111	World Regional Geography	3 SHC		
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		

*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Sustainability Technologies (A40370)	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**24-25 SHC**	**12 SHC**	
A diploma offered under this AAS degree requires a minimum of 12 SHC extracted from the required subject/course core of the AAS degree.			
Required Courses:			
ENV 110 Environmental Science 3 SHC			
or BIO 140 Environmental Biology 3 SHC			
SST 110 Intro to Sustainability 3 SHC			
SST 120 Energy Use Analysis 3 SHC			
SST 210 Issues in Sustainability 3 SHC			
Required Subject Areas: Select one.			
Renewable Energy.			
ALT 120 Renewable Energy Tech 3 SHC			
ELC 220 Photovoltaic Sys Tech 3 SHC			
ALT 250 Thermal Systems 3 SHC			
SST 130 Modeling Renewable Energy 3 SHC			
Green Building.			
CST 111 Construction I 4 SHC			
SST 140 Green Building & Design Concepts 3 SHC			
CST 150 Building Science 3 SHC			
ARC 131 Building Codes 3 SHC			
or CMT 120 Codes and Inspections 3 SHC			
B. Program Major(s): Not Applicable			

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

AHR, ALT, ARC, AGR, ATR, BAS, BIO, BPR, BUS, CAR, CEG, CHM, CIS, CIV, CMT, COE, CSC, CST, DBA, DFT, EGR, EHS, ELC, ELN, ENV, EPP, FMW, FOR, GEL, GEO, GIS, HOR, ISC, LAR, LID, LSG, MAC, MEC, MNT, NET, OMT, PAD, PHS, PHY, PLU, PME, PMT, SRV, SST, and WAT

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**

Curriculum Standard for Mobile Equipment Maintenance and Repair

Career Cluster: Transportation, Distribution and Logistics **

Cluster Description: The planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

Pathway: Mobile Equipment Maintenance and Repair	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code			Credential Level(s) Offered	Program Major Code
Agricultural Systems Technology	CIP Code	01.0205	AAS/Diploma/Certificate	A60XXX
Alternative Transportation Technology	CIP Code:	47.0614	Diploma/Certificate	D60XXX
Automotive Customizing Technology	CIP Code	47.0603	AAS/Diploma/Certificate	A60190
Automotive Light-Duty Diesel Technology	CIP Code	47.0605	Diploma/Certificate	D60XXX
Automotive Restoration Technology	CIP Code	47.0603	Diploma/Certificate	D60140
Automotive Systems Technology	CIP Code	47.0604	AAS/Diploma/Certificate	A60160
Collision Repair and Refinishing Technology	CIP Code	47.0603	AAS/Diploma/Certificate	A60130
Construction Equipment Systems Technology	CIP Code	47.0302	AAS/Diploma/Certificate	A60XXX
Diesel and Heavy Equipment Technology	CIP Code	47.0613	AAS/Diploma/Certificate	A60XXX
Motorcycle Mechanics	CIP Code	47.0611	AAS/Diploma/Certificate	A60260
Recreational Vehicle Maintenance and Repair Technology	CIP Code	47.0618	Diploma/Certificate	D60310

Pathway Description:

Curriculums in the Mobile Equipment Maintenance and Repair pathway prepare individuals for employment as entry-level transportation service technicians. The program provides an introduction to transportation industry careers and increases student awareness of the diverse technologies associated with this dynamic and challenging field.

Course work may include transportation systems theory, braking systems, climate control, design parameters, drive trains, electrical/electronic systems, engine repair, engine performance, environmental regulations, materials, product finish, safety, steering/suspension, transmission/transaxles, and sustainable transportation, depending on the program major area chosen.

Graduates of this pathway should be prepared to take professional licensure exams, which correspond to certain programs of study, and to enter careers as entry-level technicians in the transportation industry.

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:***

Agricultural Systems Technology: A program that prepares individuals to maintain and repair specialized farm, ranch, and agribusiness power equipment and vehicles. Includes instruction in the principles of diesel, combustion, electrical, steam, hydraulic, and mechanical systems and their application to the maintenance of terrestrial and airborne crop-spraying equipment; tractors and hauling equipment; planting and harvesting equipment; cutting equipment; power sources and systems for silos; irrigation and pumping equipment; dairy, feeding, and shearing operations; and processing systems

**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.*

Alternative Transportation Technology: A program that prepares individuals to apply technical knowledge and skills to the maintenance of alternative fuel vehicles (AFV), hybrid electric vehicles and the conversion of standard vehicles to AFV status. Includes instruction in electrical vehicles, hybrid electric vehicles, liquefied petroleum gas (LPG) vehicles, compressed natural gas (CNG) vehicles, hybrid fuel technology, electrical and electronic systems, engine performance, diagnosis and repair, and conversion/installation.

Automotive Customizing Technology: A program that prepares individuals to modify existing automotive vehicle components, fabrication techniques to create custom vehicle components, non-structural damage repair, custom painting and refinishing techniques, custom upholstery and glass removal/replacement/custom modifications, and other automotive technology related systems.

Automotive Light-Duty Diesel Technology: A program that prepares individuals to apply technical knowledge and skills to diagnose, adjust, repair, or overhaul light duty diesel vehicles under one ton classification. Includes instruction in electrical systems, diesel-electric drive, engine performance, engine repair, emission systems, and all types of diesel engines related to the light duty diesel vehicle. Includes technicians working primarily with automobile diesel engines.

Automotive Restoration Technology: A program that prepares individuals to apply technical knowledge and skills to repair, reconstruct, finish and restore automobile bodies, fenders, and external features of a wide range of classic vehicles typically from year models 1900 - 1970. Includes instruction in internal combustion engines, transmissions, brakes, restoring original sheet metal, upholstery, and wood components, rebuilding starters, generators, and painting and refinishing techniques.

Automotive Systems Technology: A program that prepares individuals to apply technical knowledge and skills to repair, service, and maintain all types of automobiles. Includes instruction in brake systems, electrical systems, engine performance, engine repair, suspension and steering, automatic and manual transmissions and drive trains, and heating and air condition systems

Collision Repair and Refinishing Technology: A program that prepares individuals to apply technical knowledge and skills to repair, reconstruct and finish automobile bodies, fenders, and external features. Includes instruction in structure analysis, damage repair, non-structural analysis, mechanical and electrical components, plastics and adhesives, painting and refinishing techniques, and damage analysis and estimating.

Construction Equipment Systems Technology: A program that prepares individuals to apply technical knowledge and skills in the field maintenance and repair of construction equipment, and in the general maintenance and overhaul of such equipment. Includes instruction in inspection, maintenance, and repair of tracks, wheels, brakes, operating controls, pneumatic and hydraulic systems, electrical circuitry, engines and in techniques of welding and brazing.

Diesel and Heavy Equipment Technology: A program that prepares individuals to apply technical knowledge and skills to repair, service, and maintain diesel engines in vehicles such as Heavy Duty Trucks over one ton classification, buses, ships, railroad locomotives, and equipment; as well as stationary diesel engines in electrical generators and related equipment.

Motorcycle Mechanics: A program that prepares individuals to apply technical knowledge and skills to repair, service, and maintain motorcycles and other similar powered vehicles. Includes instruction in lubrication and cooling systems, electrical and ignition systems, carburetion, fuel systems and adjustments of moving parts.

Recreational Vehicle Maintenance and Repair Technology: A program that prepares individuals to apply technical knowledge and skills to build, test, inspect, repair, service and maintain recreational vehicles, systems, and interior and exterior components. Includes instruction in brake, hydraulic, and towing systems; electrical systems; propane systems and propane and electric appliances; carpentry; plumbing; welding; and structural frames.

I. General Education Academic Core

[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204(3)]*: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Mobile Equipment Maintenance and Repair

Recommended 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. **Communication:*	**6 SHC**	**3-6 SHC**	**Optional**
*COM 101 Workplace Communication 3 SHC COM 110 Introduction to Communications 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 Prof Research & Reporting 3 SHC ENG 116 Technical Report Writing 3 SHC			
Humanities/Fine Arts:	**3 SHC**	**0-3 SHC**	**Optional**
*HUM 101 Values in the Workplace 2 SHC HUM 110 Technology and Society 3 SHC HUM 115 Critical Thinking 3 SHC HUM 230 Leadership Development 3 SHC PHI 230 Introduction to Logic 3 SHC PHI 240 Introduction to Ethics 3 SHC			
Social /Behavioral Sciences:	**3 SHC**	**0-3 SHC**	**Optional**
ECO 151 Survey of Economics 3 SHC ECO 251 Principles of Microeconomics 3 SHC *SOC 105 Social Relationships 3 SHC SOC 210 Introduction to Sociology 3 SHC SOC 215 Group Process 3 SHC *PSY 101 Applied Psychology 3 SHC *PSY 102 Human Relations 2 SHC PSY 118 Interpersonal Psychology 3 SHC PSY 135 Group Processes 3 SHC PSY 150 General Psychology 3 SHC			
Natural Sciences/Mathematics:	**3 SHC**	**0-3 SHC**	**Optional**
*MAT 101 Applied Mathematics I 3 SHC MAT 110 Mathematical Measurements 3 SHC MAT 115 Mathematical Models 3 SHC MAT 120 Geometry and Trigonometry 3 SHC MAT 121 Algebra/Trigonometry 3 SHC PHY 110 Conceptual Physics 3 SHC PHY 121 Applied Physics I 4 SHC			

**Recommended certificate and diploma level curriculum courses. These courses may not be included in associate degree programs.*

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

A. Technical Core. The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.

B. Program Major(s). The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Mobile Equipment Maintenance and Repair	**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core: *Courses required for the diploma program major are designated with an asterisk (*).*	**19-23 SHC**	**17-20 SHC**	
***Fundamental Transportation Skills. Choose one minimum:** TRN 110 Intro to Transport Tech 2 SHC TRN 170 PC Skills for Transp 2 SHC HET 134 Diesel Fuel and Power Sy 3 SHC			
***Intermediate Transportation Skills. Choose one minimum:** TRN 120 Basic TranspElectricity 5 SHC TRN 130 Intro to Sustainable Transp 3 SHC TRN 180 Basic Welding for Transp 3 SHC			
Specialized Transportation Skills. Choose one minimum: TRN 140 Transp Climate Control 2 SHC TRN 145 Adv Transp Electronics 3 SHC WLD 110 Cutting Processes 2 SHC			
B. Program Major(s). *For both AAS Degree and Diploma, 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.*			
Agricultural Systems Technology ELN 112 Diesel Electronics System 4 SHC PME 111 Harvest and Spraying Equip 4 SHC PME 112 Consumer Products 2 SHC PME 121 Component Controls 2 SHC			
Alternative Transportation Technology ATT 115 Green Trans Safety and Service 2 SHC ATT 125 Hybrid-Electric Transportation 4 SHC ATT 140 Emerging Transp Techn 3 SHC			

Automotive Customizing Technology

AUC	111	Auto Customizing Research	3 SHC
AUC	112	Auto Custom Fabrication	4 SHC
AUC	115	Glass Customizing Methods	4 SHC

Automotive Restoration Technology

ARS	112	Auto Restoration Research	3 SHC
ARS	113	Automotive Upholstery	4 SHC
ARS	114	Restoration Skills I	4 SHC

Automotive Systems Technology

AUT	141	Suspension and Steering	3 SHC
AUT	151	Brake Systems	3 SHC
AUT	181	Engine Performance I	3 SHC

Automotive Light-Duty Diesel Technology

LDD	112	Intro Light-Duty Diesel	3 SHC
LDD	116	Diesel Electric-Drive	4 SHC
LDD	181	LDD Fuel Systems	4 SHC

Collision Repair and Refinishing Technology

AUB	111	Painting and Refinishing I	4 SHC
AUB	121	Non-Structural Damage I	3 SHC
AUB	131	Structural Damage I	4 SHC

Construction Equipment Systems Technology

HYD	134	Hyd/Hydrostatic Construction	4 SHC
PME	117	Equipment Braking Systems	3 SHC
PME	118	Undercarriage Components	2 SHC
PME	221	Const Equip Servicing	2 SHC

Diesel and Heavy Equipment Technology

HET	110	Diesel Engines	6 SHC
HET	114	Power Trains	5 SHC
HET	125	Preventive Maintenance	2 SHC
		Or	
MRN	121	Marine Engines	4 SHC
MRN	147	Marine Power Trains	4 SHC
MRN	150	Adv. Marine Electricity	5 SHC

Motorcycle Mechanics

MCM	111	Motorcycle Mechanics	7 SHC
MCM	114	Motorcycle Fuel Systems	5 SHC
MCM	115	Motorcycle Chassis	3 SHC

Recreational Vehicle Maintenance and Repair Technology

RVM	112	RV Preventive Maintenance	2 SHC
RVM	115	Pre-Delivery Inspection	2 SHC
RVM	160	RV Water Systems	4 SHC

C. Other Major Hours.

To be selected from the following prefixes:

ACA , ACC, ARS, ATR, ATT, AUB, AUC, AUM, AUT, BMS, BPR, BTB, BUS, CIS, COE, CSC, CTS, DBA, DDF, DEA, DFT, ELC, ELN, FBG, GRA, HET, HYD, ISC, LDD, LOG, MAC, MCM, MEC, MKT, MPS, MRN, MSM, NOS, PHY, PME, RCT, RVM, SEL, SST, TRN, WEB, and WLD

Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.

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**