



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

May 26, 2010

MEMORANDUM

TO: Presidents
Chief Academic Officers

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

SUBJECT: State Board Action on May 21, 2010
New and Revised Curriculum Standards

On May 21, 2010, the State Board of Community Colleges approved the following new curriculum program and new course:

Mechatronics Engineering Technology (A40350)
ELC 130 Advanced Motors/Controls

The State Board of Community Colleges also approved revisions to the following curriculum standards:

Nondestructive Examination Technology (A50350)
Professional Arts and Crafts: Sculpture (A30290)

Please be aware that you must implement the standard revision changes no later than one year after the effective term. You must update your college's electronic program of study and receive approval from the System Office prior to implementation of the revised program.

The new and revised curriculum standards and new course are attached for your convenience. You may view all curriculum standards and courses by visiting the Program Services website at:

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

If you have any questions concerning these State Board action items, please contact Dr. Judith C. Mann at 919-807-7108 or mannj@nccommunitycolleges.edu.

SEM/JF/swj
Attachments
c: Dr. Judith C. Mann
Dr. John Pettitt
Ms. Jennifer Frazelle
Program Coordinators

CC10-019
Email

CURRICULUM STANDARD

Effective Term
Fall 2010
[2010*03]

Curriculum Program Title

Mechatronics Engineering Technology

Code

A40350

Concentration

(not applicable)

Curriculum Description

This curriculum is designed to prepare individuals for jobs requiring electrical, mechanical, and computer skills necessary to work on computer controlled electro-mechanical systems with embedded electronics, sensors and actuators, found in manufacturing environments.

Course work includes basic electricity, fluid mechanics, mechanical drives, instrumentation, motor control, and courses specific to electrical, mechanical, or controls specialties.

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.

*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.

Mechatronics Engineering Technology A40350

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
<p>A. CORE <i>Courses required for the diploma are designated with *</i></p> <p>*Required Courses: ATR 112 Intro to Automation 3 SHC ELC 213 Instrumentation 4 SHC</p> <p>Required Subject Areas. * Basic Electricity. Select one course or group: ELC 111 Intro to Electricity 3 SHC <i>or</i> ELC 112 DC/AC Electricity 5 SHC <i>or</i> ELC 138 DC Circuit Analysis 3 SHC <i>and</i> ELC 139 AC Circuit Analysis 3 SHC</p> <p>*Computer Applications. Select one: CIS 110 Introduction to Computers 3 SHC CIS 111 Basic PC Literacy 2 SHC EGR 125 Appl Software for Technicians 2 SHC</p> <p>Drawing. Select one: DFT 119 Basic CAD 2 SHC DFT 151 CAD I 3 SHC EGR 120 Eng and Design Graphics 3 SHC ELC 132 Electrical Drawings 2 SHC DFT 154 Intro Solid Modeling 3 SHC DFT 170 Engineering Graphics 3 SHC</p> <p>Fluid Mechanics. Select one: HYD 110 Hydraulics/Pneumatics I 3 SHC MEC 265 Fluid Mechanics 3 SHC</p> <p>Mechanical Drives. Select one: MEC 130 Mechanisms 3 SHC MEC 275 Engineering Mechanisms 3 SHC</p> <p>Machines. Select one course or group: ELC 117 Motors and Controls 4 SHC <i>or</i> ELC 130 Advanced Motors/Controls 3 SHC <i>or</i> ELC 135 Electrical Machines I 3 SHC <i>and</i> ELC 136 Electrical Machines II 4 SHC</p> <p>Programmable Logic Controllers. Select one: ELC 128 Intro to PLC 3 SHC ELN 260 Prog Logic Controllers 4 SHC</p> <p>*Safety. Select one: ISC 110 Workplace Safety 1 SHC ISC 112 Industrial Safety 2 SHC</p>	27-38 SHC	13-18 SHC	

CONCENTRATION <i>(Not applicable)</i>			
<p>C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> ATR, BPM, BTC, CET, COE, CIS, CSC, DFT, EGR, ELC, ELN, HYD, ISC, MAC, MEC, MNT, PCI, PKG and PHY</p> <p><i>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.</i></p>			

ELECTRICITY

Effective Term - Fall 2010 [2010*03] - SBCC 05/21/10

ELC 130 Advanced Motors/Controls

2 2 3

Prerequisites:ELC 111 or ELC 112 or ELC 138

Corequisites:None

This course covers motors concepts, construction and characteristics and provides a foundation in motor controls. Topics include motor control ladder logic, starters, timers, overload protection, braking, reduced voltage starting, SCR control, AC/DC drives, system and component level troubleshooting. Upon completion, students should be able to specify, connect, control, troubleshoot, and maintain motors and motor control systems.

CURRICULUM STANDARD

Effective Term
Summer 2010
[2010*02]

Curriculum Program Title

Nondestructive Examination Technology

Code

A50350

Concentration

(not applicable)

Curriculum Description

The Nondestructive Examination (NDE) Technology curriculum prepares students for careers in nondestructive assessment of materials, equipment, and/or components. NDE test methods assess an object's usefulness without affecting its function. NDE is used in many industries, including construction, energy, and aerospace.

Course work includes ultrasonics, radiography, and penetrant and magnetic particle testing. Applied math and physics are an integral part of NDE and the curriculum. Students will gain knowledge of these methods through applied theory and co-op work experiences.

The NDE curriculum will meet the qualification requirements of ASNT 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.

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 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

[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.

Nondestructive Examination Technology A50350

	AAS	Diploma	Certificate
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC
A. CORE <i>Courses required for the diploma are designated with *</i> Required Courses: * 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 (ET/MT) 3 SHC Required Subject Areas: None	24 SHC	14 SHC	
B. CONCENTRATION <i>Courses unique to the concentration are designated with **</i>			
C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i> CIS, COE, CSC, DFT, EGR, ELC, MAC, MAT, MEC, NDE, PHY, and WLD <i>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.</i>			

CURRICULUM STANDARD

Effective Term
Fall 2010
[2010*03]

Curriculum Program Title

Professional Arts and Crafts: Sculpture

Code

A30290

Concentration

(not applicable)

Curriculum Description

This curriculum is designed to prepare individuals to become professional craftsman and entrepreneurs in the areas of clay and metal sculpture.

Course work concentrates on the development of skills in each area of craftsmanship. Emphasis is placed on hands-on training and the design skills needed to aid students in personalizing their own work.

Graduates will be able to open and operate their own professional craft studio, work for an existing professional craftsman, or obtain employment in craft retail sales.

*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.

Professional Arts and Crafts: Sculpture A30290

	AAS	Diploma	Certificate																																
Minimum Major Hours Required	49 SHC	30 SHC	12 SHC																																
<p>A. CORE <i>Course(s) required for the diploma are designated with *</i></p> <p>Required Courses:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">* PCD 110 Introduction to Craft Design</td> <td style="text-align: right; padding-left: 20px;">2 SHC</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">PCS 210 Introduction to Clay Sculpture</td> <td style="text-align: right; padding-left: 20px;">4 SHC</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">PCS 110 Introduction to Metal Sculpture</td> <td style="text-align: right; padding-left: 20px;">5 SHC</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">PCS 112 Beg. Welding for Artists</td> <td style="text-align: right; padding-left: 20px;">3 SHC</td> <td></td> <td></td> </tr> </table> <p>Select 8-9 SHC from the following courses:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">PCC 110 Introduction to Pottery</td> <td style="text-align: right; padding-left: 20px;">8 SHC <i>or</i></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">ART 283 Ceramics I</td> <td style="text-align: right; padding-left: 20px;">3 SHC <i>and</i></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">ART 281 Sculpture I</td> <td style="text-align: right; padding-left: 20px;">3 SHC <i>and</i></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">PCC 121 Handbuilding I</td> <td style="text-align: right; padding-left: 20px;">3 SHC</td> <td></td> <td></td> </tr> </table> <p>Required Subject Areas: None</p>	* PCD 110 Introduction to Craft Design	2 SHC			PCS 210 Introduction to Clay Sculpture	4 SHC			PCS 110 Introduction to Metal Sculpture	5 SHC			PCS 112 Beg. Welding for Artists	3 SHC			PCC 110 Introduction to Pottery	8 SHC <i>or</i>			ART 283 Ceramics I	3 SHC <i>and</i>			ART 281 Sculpture I	3 SHC <i>and</i>			PCC 121 Handbuilding I	3 SHC			22-23 SHC	12 SHC	
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PCC 121 Handbuilding I	3 SHC																																		
B. CONCENTRATION <i>(Not applicable)</i>																																			
<p>C. OTHER MAJOR HOURS <i>To be selected from the following prefixes:</i></p> <p>ART, BUS, CIS, COE, CSC, DES, PCC, PCD, PCJ, PCR, PCS, PCW, and WLD.</p> <p><i>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.</i></p>																																			