NC COMMUNITY COLLEGES
CREATING SUCCESS

NORTH CAROLINA COMMUNITY COLLEGE SYSTEM
Ms. Jennifer Haygood
Acting President

February 19, 2018

MEMORANDUM

TO: Presidents
                   Chief Academic Officers

FROM: Wesley E. Beddard, Associate Vice President
                   Programs

SUBJECT: State Board Action on February 16, 2018
                   Revised and Archived Curriculum Standards

On February 16, 2018, the State Board of Community Colleges approved a revision to the following curriculum standard:

Industrial Management Technology (A50260)

To implement the revised program, you must update your college's electronic program of study and receive approval from the System Office prior to implementation. An outline of the specific curriculum standard revision is attached for your convenience. You may view all curriculum standards and courses by visiting the Academic Programs website at:

http://www.nccommunitycolleges.edu/academic-programs

In addition, the State Board of Community Colleges archived the following curriculum program titles due to lack of enrollment:

> **Cabinetmaking (Diploma) (D35160)**
> **Geospatial Mapping Technology (A40110)**
> **Invasive Species Management Technology (A20240)**
> **Real Estate Appraisal (A25420)**
> **Recreational Vehicle Maintenance Repair Technology (Diploma) (D60310)**
> **Small Engine and Equipment Repair Diploma (Diploma) (D60280**)

If you have any questions concerning the February State Board action items listed above, please contact Ms. Jennifer Frazelle at 919.807.7120 or frazellej@nccommunitycolleges.edu.

WB/JF/gr
Attachments
c: Dr. Lisa M. Chapman   Ms. Elizabeth Self
     Ms. Jennifer Frazelle   Program Coordinators

Outline of Curriculum Standard Revision
State Board of Community Colleges
February 16, 2017

Industrial Management Technology (A50260):

Revision:

Added the following course as an additional course option to the technical core:

BPR 111 Print Reading

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:** Summer 2018 (2018*02)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program 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

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 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.

I. General Education Academic Core
[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.97 (3)]: Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

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.

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

					AAS	Diploma	Certificate
Communications:							
*	COM	101	Workplace Communication	3 SHC	**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	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:							
*	HUM	101	Values in the Workplace	2 SHC	**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:							
	ECO	151	Survey of Economics	3 SHC	**3 SHC**	**0-3 SHC**	**Optional**
	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	110	Math Measurement & Literacy	3 SHC	**3 SHC**	**0-3 SHC**	**Optional**
	MAT	121	Algebra/Trigonometry I	3 SHC			
	MAT	143	Quantitative Literacy	3 SHC			
	MAT	152	Statistical Methods I	4 SHC			
	MAT	171	Precalculus Algebra	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-based learning 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 *	**19-22 SHC**	**12 SHC**	

A. Technical Core:

*	ISC	132	Mfg Quality Control	3 SHC
*	*Choose one:*			
	BPR	111	Print Reading	2 SHC
	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	4 SHC
ISC	136	Productivity Analysis I	3 SHC
ISC	243	Prod & Oper Management I	3 SHC

Choose one:

MEC	111	Machine Processes I	3 SHC
MEC	145	Mfg Materials I	3 SHC
MEC	161	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
MAC	114	Intro to Metrology	2 SHC
MEC	151	Mechanical Mfg Systems	2 SHC

* *Choose one:*

ATR	112	Intro to Automation	3 SHC
BPR	111	Print Reading	2 SHC
HYD	110	Hydraulics/Pneumatics I	3 SHC
HYD	180	Pneumatics in Automation	3 SHC
ISC	220	Lean Manufacturing	3 SHC

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

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

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

Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.

III. Other Required Hours

A college may include courses to meet graduation or local employer requirements in a certificate (0-1 SHC), diploma (0-4 SHC), or an associate in applied science (0-7 SHC) program. These curriculum courses shall be selected from the Combined Course Library and must be approved by the System Office prior to implementation. Restricted, unique, or free elective courses may not be included as other required hours.

IV. Employability Competencies

Fundamental competencies that address soft skills vital to employability, personal, and professional success are listed below. Colleges are encouraged to integrate these competencies into the curriculum by embedding appropriate student learning outcomes into one or more courses or through alternative methods.

A. **Interpersonal Skills and Teamwork** – The ability to work effectively with others, especially to analyze situations, establish priorities, and apply resources for solving problems or accomplishing tasks.

B. **Communication** – The ability to effectively exchange ideas and information with others through oral, written, or visual means.

C. **Integrity and Professionalism –** Workplace behaviors that relate to ethical standards, honesty, fairness, respect, responsibility, self-control, criticism and demeanor.

D. **Problem-solving** – The ability to identify problems and potential causes while developing and implementing practical action plans for solutions.

E. **Initiative and Dependability** – Workplace behaviors that relate to seeking out new responsibilities, establishing and meeting goals, completing tasks, following directions, complying with rules, and consistent reliability.

F. **Information processing** – The ability to acquire, evaluate, organize, manage, and interpret information.

G. **Adaptability and Lifelong Learning –** The ability to learn and apply new knowledge and skills and adapt to changing technologies, methods, processes, work environments, organizational structures and management practices.

H. **Entrepreneurship –** The knowledge and skills necessary to create opportunities and develop as an employee or self-employed business owner.

*An **Employability Skills Resource Toolkit** has been developed by NC-NET for the competencies listed above. Additional information is located at: http://www.nc-net.info/employability.php*

**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**