Miami Dade College
College-wide CASSC Meeting – JUNE 9, 2009
CURRICULUM REPORT #64

1. Biotechnology

Executive Summary
Advanced Manufacturing

I. Introduction – The proposed Advanced Manufacturing program was created in response to the growing state and nation-wide industry need for a skilled workforce prepared for entry-level positions as Manufacturing Engineering Technicians, Quality Specialists and Automation Specialist (SOC 173027) in the manufacturing divisions of bioscience, pharmaceutical and industrial & medical device companies.

II. Program Goals - The primary goals of this proposal are to create; (1) a 12 credit hours College Credit Certificate (CCC) in Lean Manufacturing (CIP = 0615.061302), (2) a 15 credit hours College Credit Certificate (CCC) in Automation (CIP = 0615.061301), and (3) a 60 credit hours Associate in Science (AS) in Advanced Manufacturing degree (CIP = 1615.061300). The creation of this degree and certificate programs also satisfies the curriculum objectives of the College's US Department of Education, Title V grant (Biosciences Cooperative).

III. Program Needs and Benefits

a. Demonstrated National Need – The manufacturing sector continues to account for 11% of the total US employment. The national projected employment outlook for manufacturing technicians from 2006 – 2016 is estimated to grow 10%. A 2005 survey of US manufacturing firms found that employers have a serious problem finding qualified candidates for an increasing number of new jobs. The Federal Government's High Growth Job Training Initiative in collaboration with the US Department of Labor, is a strategic effort to prepare workers for increasing job opportunities in high growth, high demand and economically vital sectors of the economy. The initiative aims to expand the pipeline of youth entering the manufacturing sector. In just two years, the export rate for this industry increased by 83%, from $3.2 billion in 2006 to $5.9 billion in 2008 (US Trade in Advanced Technology Products, August 2008).

b. Demonstrated State Need – According to the Employ Florida Marketplace, the pharmaceutical manufacturing industry is projected to grow by 28.2 percent between 2007 and 2015, (http://www.employflorida.com/indprofiledata). According to the Biotechnology Industry Organization's 2008 Florida State Report, in the Medical Devices and Equipment sub sector, Florida exceeds national growth rates by five percent for the number of bioscience establishments and employment. Of the patents issued in Florida, the largest category was in surgical and medical instruments. Florida ranks 8th nationally in number of related patents. This demonstrates the need for an expanded demand for workers in the bioscience and industrial devices manufacturing areas. The demand for manufacturing technician employment outlook in Florida is estimated to be 13% projected growth between 2007 and 2015. According to the FLDOE Choices Planner, the salary information for Florida manufacturing technicians (SOC 173027) is as follows:

- Average Annual Wage: $46,634
- Entry Annual Wage: $30,805
- Experienced Annual Wage: $54,538
- Entry Hourly Wage: $14.81
- Experienced Hourly Wage: $26.22

- Average Hourly Wage: $22.42

c. Local organizations including South Florida Manufacturing Association, South Florida Workforce Investment Board, Noven Pharmaceuticals, Johnson & Johnson/Cordis Corporation, Kirk Pharmaceuticals, Schering-Plough Corporation, and Miami Dade County Public Schools, participated in a professional focus group activity sponsored by the Biosciences Cooperative at Miami Dade College. The purpose was to identity the skill sets needed to work in the manufacturing industry. These organizations also participate on our Advisory Committee and have documented the growing need for a skilled entry-level Bioscience manufacturing workforce in South Florida.

IV. Student Demand - MDC's Biotechnology Program staff conducted a survey of students in March 2009 to assess interest in Advanced Manufacturing education. A total of 312 students completed the survey. 80 students, (26%) stated that they would be interested in enrolling in Advanced Manufacturing courses. 91 students, (29%) indicted they would be interested in obtaining an Associates degree in Advanced Manufacturing. 62 students, (20%) indicated that they would be interested in the College Credit Certificate in Automation. 96 students, (31%) expressed interest in the College Credit Certificate in Lean Manufacturing.

V. Implementation Strategies - The anticipated date of implementation for the AS and CCC programs is spring 2009-2 (January 2010). The proposed new lab course will be taught at both the Wolfson and North Campuses. All other coursework can be taken through current offerings at all other MDC campuses. The proposed laboratory class will utilize the newly created biotechnology labs at Wolfson and North Campuses. Instructional support materials needed to teach the new courses will be funded by the existing Biosciences Cooperative grant. We anticipate enrolling 30 students in the AS program and 20 students in the CCC programs the first year. Any additional costs of instruction due to increased course enrollment will be offset by the Biosciences Cooperative grant funds. An interdisciplinary, intercampus group of faculty, administrators, and professional consultants have addressed curricular competencies, learning outcomes, course titles, course numbers, and pre-requisites. Existing engineering and biology faculty will continue to teach all currently offered courses. The Bioscience Cooperative Grant, if necessary, will provide funding for the practical training needs of faculty to upgrade their skill levels to teach the three new courses. A new SACS credential for engineering and natural sciences faculty to teach the new courses has been submitted.

VI. Curriculum

a. The College Credit Certificate (CCC - 12 credits) – in Lean Manufacturing prepares students for entry-level employment as Quality Specialists, Lean Specialists or related work in a manufacturing setting. The program will provide the knowledge and skill sets necessary for careers in manufacturing. The program focuses on how to plan, procure, schedule resources, including people, in order to execute efficient, quality production operations. Manufacturing related issues like lean and six sigma, inventory control, and regulations are covered. The CCC can also provide supplemental training for adult students previously or currently employed in the manufacturing industry. These courses will apply toward the AS degree in Advanced Manufacturing.

b. College Credit Certificate (CCC - 15 credits) – in Automation prepares students for entry-level employment with an occupational title as an Automation or Applied Automation Specialist in various specialized areas, or to provide supplemental training for persons previously or currently employed in these occupations. Skills learned include how to operate and troubleshoot industrial automation systems, how to apply the principals of robotics to industrial automation systems, and how to use proficiently human interfaces to control automatic systems. The CCC can also provide supplemental training for adult

students previously or currently employed in the manufacturing industry. These courses will apply toward the AS degree in Advanced Manufacturing.

c. The Associate of Science (AS, 60 credits) -Advanced Manufacturing degree is designed to teach students the basic principles, concepts, and techniques necessary for effective work in the industrial device and pharmaceutical manufacturing industries. The program will provide students with the opportunity to acquire the knowledge and skill sets necessary for careers in manufacturing. Students will learn the basic concepts of advanced manufacturing operations and processes, including sourcing materials, production planning and process monitoring, and distribution activities. Students will acquire broad, transferable skills including ethical and environmental issues, manufacturing, patenting, instrumentation and Standard Operating Procedures, (SOP) validation. Students will learn the basic operations and concepts of programmable logic controllers (PLCs), how to maintain PLCs in industrial environments, and principles of computer-controlled machines and processes. The program prepares graduates for employment opportunities as Manufacturing Engineering Technicians and Quality Specialists in the bioscience and pharmaceutical manufacturing industries. The program culminates with a required capstone course based on the individual student's career interests and goals. Students are required to obtain Department Chairperson's approval to register for one of the following: EGN-1949, Co-op Work Experience or BSC-2943L, Bioscience Internship.

New Program
Advanced Manufacturing Technology
Add New Courses

Course No.	Course Title	Credits	Campus	Eff. Term
ETI1622	Concepts of Lean and Six Sigma	3	1, 3	2009-2

Course Description: This course is designed for students who are preparing for careers in the manufacturing industry. Students will learn the basic concepts, frameworks, and techniques used in six sigma, including total quality philosophies, the calculation of six sigma and other vital statistics, tools of lean six sigma, and knowledge of various methodologies (3 hrs lecture). A.S. degree only.

Course No.	Course Title	Credits	Campus	Eff. Term
ETI1644	Advanced Manufacturing Supply Chain	3	1, 3	2009-2

Course Description: This course is designed to provide the fundamental concepts of advanced manufacturing supply chain management (SCM) principles. Students will learn how to use manufacturing planning and control systems to coordinate material, labor, capacity and other resources to optimize manufacturing operations. Students also learn the key features of automated systems that can be used to manage the supply chain process. (3 hrs lecture). A.S. degree only.

Course No.	Course Title	Credits	Campus	Eff. Term
ETI1040L	Introduction to Bioscience Manufacturing Lab	3	1, 3	2009-2

Course Description: In this laboratory course students will learn the basic principles of the industry, large-scale process development and the future of bioscience. Students also learn about current Good Manufacturing Practices (GMPs), and the nature and delivery system of products. Corequisite: ETI 1040 (2hrs lab), A.S. degree only.

Course No.	Course Title	Credits	Campus	Eff. Term
ETI2403	Advanced Manufacturing Technology	3	1, 3	2009-2

Course Description: This is a course for students intending to work in manufacturing environments. Students will learn the basic concepts about advanced manufacturing operations and processes, including sourcing materials, production planning and process monitoring, and control to distribution activities. Students also review the facility and

regulatory requirements needed to support manufacturing operations. Activities may include facility tours and site visits. (3hrs lecture). A.S degree only.

Add Existing Course

Course No.	Course Title	Credits	Campus	Eff. Term
BSC2943L	Bioscience Internship	3	1, 3	2009-2

Course Description: This internship course is a capstone for students majoring in bioscience and related programs. Students will learn to apply acquired knowledge and skills in the bioscience workplace to gain employment. Pre-requisite: Successful completion of required program course work and department approval. (Variable hours: 3-6 credits based on work assignment and hours worked.) A.S. degree only.

Course No.	Course Title	Credits	Campus	Eff. Term
EGN1949	Engineering Co-Operative Work Experience	3	1,2,3,5,6,7,8	2009-2

Course Description: This is a capstone course designed for students majoring in engineering programs. Students will learn to apply the skills and knowledge that they have acquired through their program of study in a real work environment. Pre-requisite: Successful completion of required program course work and department approval. AS credit only. (Variable hours: 1 - 4 credits based on work assignment and hours worked.) A.S. degree only.

APPROVE_____OPPOSE_____ MORE INFORMATION_____

Associate of Science Degree
Advanced Manufacturing
Total credits required for the degree is 60
(CIP= 1615.061300)
(SOC= 17-3027)

The AS in Advanced Manufacturing will provide students with the opportunity to acquire the knowledge and skill sets necessary for careers in manufacturing with an emphasis in industrial device and pharmaceutical manufacturing. The program prepares students for employment as a Manufacturing Engineering Technician or Production Technician in manufacturing settings.

Course Title	Credits	Pre-requisites	Co-requisites
GENERAL EDUCATION REQUIREMENTS (15 credits)			
ENC-1101 English Composition I	3	None	None
SPC-1026 Fundamentals of Speech Comm.	3	None	None
PHI-2604 Critical Thinking & Ethics	3	ENC-1101	None
CLP-1006 Psychology of Personal Effectiveness	3	None	None
MAC-1105 College Algebra	3	MAT 1033 or College Placement Test	None
REQUIRED PROGRAM COURSES (41 credits)			
ETI-1622 Concepts of Lean and Six Sigma	3	None	None
ETI-1644 Advanced Manufacturing Supply Chain	3	None	None
ETI-1701 Industrial Safety	3	None	None
ETI-1181 Introduction to Quality Assurance	3	None	None
ETI-2403 Advanced Manufacturing Technology	3	None	None
ETM-1315C Applied Pneumatics & Hydraulics	3	MAC-1105	None

ETI-1040 Introduction to Bioscience Manufacturing	3	None	None
ETI-1040L Introduction to Bioscience Manufacturing Lab	2	None	ETI-1040
MTB-1322 Technical Mathematics 2	3	MAC-1105	None
EET-1015C Direct Current Circuit	4	MAC-1105	None
EET-1025C Alter. Current Circ.	4	EET-1015C	MTB-1322
EET-1141C Electronics I	4	EET-1025C	None
EST-2542C Programmable Logic Controllers I	3	EET-1141C	None
Capstone Course Requirement (4 credits)			
BSC-2943L Bioscience Internship	4	Requires department approval	
OR			
EGN-1949 Co-op Work Experience	4	Requires department approval	
Total credit hours required for the degree =	60		

New course

Associate of Science Degree
Advanced Manufacturing
Total credits required for the degree is 60.
(CIP= 1615.061300)

Course Title	Credits	Pre-requisites	Co-requisites
SEMESTER 1			
MAC-1105 College Algebra	3	MAT-1033 or CPT	None
ENC-1101 English Composition I	3	None	None
ETI-1040 Introduction to Bioscience Manufacturing	3	None	None
ETI-1040L Introduction to Bioscience Manufacturing Lab	2	None	ETI-1040
	11		
SEMESTER 2			
CLP-1006 Psychology of Personal Effectiveness	3	None	None
EET-1015C Direct Current Circuit	4	MAC-1105	None
ETI-2403 Advanced Manufacturing Technology	3	None	None
SPC-1026 Fundamentals of Speech Comm.	3	None	None
	13		
SEMESTER 3			
EET-1025C Alternating Current Circuits	4	EET-1015C	MTB-1322
ETI-1622 Concepts of Lean and Six Sigma	3	None	None
ETI-1701 Industrial Safety	3	None	None
MTB-1322 Technical Mathematics 2	3	MAC-1105	None
	13		
SEMESTER 4			
PHI-2604 Critical Thinking & Ethics	3	ENC-1101	None
EET-1141C Electronics I	4	EET-1025C	None
ETI-1644 Advanced Manufacturing Supply Chain	3	None	None
ETI-1181 Introduction to Quality Assurance	3	None	None
	13		

SEMESTER 5

ETM-1315C Applied Pneumatics & Hydraulics	3	MAC-1105	None
EST-2542C Programmable Logic Controllers I	3	EET-1141C	None
BSC-2943L Bioscience Internship	4	Requires department approval	
OR			
EGN-1949 Co-op Work Experience	4	Requires department approval	
	10		

TOTAL 60

College Credit Certificate in
Lean Manufacturing
Total credits required for the certificate is 12
CIP Number: 0615.061302
SOC Code: 17-3027

This certificate prepares students for initial employment with an occupational title as a Quality Specialist or Lean Specialist in various specialized areas. It also can provide supplemental training for persons previously or currently employed in these occupations. These courses can be applied toward the Associate of Science in Advanced Manufacturing.

Course	Course Title	Credits	Pre-requisite	Co-requisite
	COURSES (12 credits)			
ETI-1622	Concepts of Lean and Six Sigma	3	None	None
ETI-1181	Introduction to Quality Assurance	3	None	None
ETI-1644	Advanced Manufacturing Supply Chain	3	None	None
ETI2403	Advanced Manufacturing Technology	3	None	None

College Credit Certificate in
Automation
Total credits required for the certificate is 15
CIP Number: 0615.061301
SOC Code: 17-3027

This certificate prepares students for initial employment with an occupational title as an Automation or Applied Automation Specialist in various specialized areas. It can also provide supplemental training for persons previously or currently employed in these occupations. These courses can be applied toward the Associate of Science in Advanced Manufacturing.

Course	Course Title	Credits	Pre-requisite	Co-requisite
	COURSES (15 credits)			
ETI-1040	Introduction to Bioscience Manufacturing	3	None	None
ETM-1315C	Applied Pneumatics and Hydraulics	3	MAC-1105	None

ETI-1701	Industrial Safety	3	None	None
ETI-2403	Advanced Manufacturing Technology	3	None	None
MAC-1105	College Algebra	3	CPT	None

2. School of Computer and Engineering Technologies

AS Program Revisions

Computer Information Technology (25055)

Add new courses as major course requirements

Recommended Course User Fee $55.00

Course No.	Course Title	Credits	Campus	Eff. Term
CGS2108	Advanced Desktop Applications	4	1,2,3,5,6,7,8	2009-1

Course Description: This is an advanced level course for major and non-major students who have completed CGS 1060, Introduction to Microcomputer Usage. Students will learn advanced computer skills using software applications, such as word processing, spreadsheets, database, presentation graphics, and communications and scheduling software. Students will also learn advanced file management techniques, deal with security issues, and troubleshoot hardware and software. Pre-requisite: CGS1060. A.S. degree credit only. Laboratory fee. (3 hr. lecture; 2 hr. lab)

Course No.	Course Title	Credits	Campus	Eff. Term
CTS1526	Intro. to Web Page Development	4	1,2,3,5,6,7,8	2009-1

Course Description: This introductory course covers the basics of web design and development. Students will learn about the World Wide Web, Hypertext Markup Language (HTML), Extensible Hypertext Markup Language (XHTML), Cascading Style Sheets (CSS) and JavaScript using popular web authoring tools such as Dreamweaver. Students will also learn the basic functions of HTML, XHTML, CSS and JavaScript and how to develop and maintain a website. Prerequisite: CGS1060. Laboratory fee. AS degree credit only. (3 hr. lecture, 2 hr. lab)

Course No.	Course Title	Credits	Campus	Eff. Term
CTS1740	A+ Computer Essentials & Support	4	1,2,3,5,6,7,8	2009-1

Course Description: This is an intermediate level course designed for students preparing for A+ certification as a support technician. Students will learn how to install, configure, upgrade and replace computer system components; how to troubleshoot processors, memory, storage devices, adapter cards, peripherals and other system components; how to install, configure and troubleshoot operating systems, laptops, portable devices, printers, scanners, network devices and security measures; and how to provide professional IT support and customer service. Pre-requisite(s): CGS1560. Laboratory fee. A.S. degree credit only. (3 hr lecture, 2 hr lab)

Course No.	Course Title	Credits	Campus	Eff. Term
CTS2153	Supporting Windows Users & Applications	4	1,2,3,5,6,7,8	2009-1

Course Description: This is an advanced course designed to help students prepare for the Microsoft Certified IT Professional Support Technician certification. Students will learn how to install, configure and manage Windows applications in a networked Windows environment and how to support enterprise users. Students will also deploy Windows and applications using various methods, resolve installation and compatibility issues, establish group policies and user profiles, perform support functions, troubleshoot user and application issues, secure the desktop and network from unauthorized use, install software upgrades and updates, perform systems monitoring and documentation, and develop customer service skills. Prerequisite(s): CTS 1328. Laboratory Fee. A.S. degree credit only. (3 hr. lecture, 2 hr. lab)

Course No.	Course Title	Credits	Campus	Eff. Term
CTS2154	IT Help Desk Support	4	1,2,3,5,6,7,8	2009-1

Course Description: This course is designed to prepare students as entry-level help desk computer support technicians. Students will learn skills needed to support computer users within the business organization and to provide exceptional customer service, including how to identify the appropriate tools, technologies, and processes to assess and meet computer user needs, essential communications skills, the IT function within the business organization, and career opportunities in computer user support. Prerequisite(s): CGS1060; CGS2108. Laboratory fee. A.S. degree credit only. (3 hr lecture, 2 hr lab)

Add existing courses as major course requirements

CEN1301 Supporting MS Clients (State mandated change to CTS1328)
CEN1511 Networking Technologies (State mandated change to CTS1134)
CET1600 Networking Fundamentals Essentials

Add existing courses as electives

CET1610 Router Technology
CET2615 Advanced Router Technology
CET2620 Project Based Learning

Delete courses from program, retain as electives

CGS1501 Microcomputer Word Processing
CGS1511 Spreadsheets
CGS1541 Database Management
CGS180 Desktop Publishing
CTS2550 PowerPoint
CGS1871 Intro to Multimedia

Delete course from program

MKA Intro to Customer Service

Change course title

CGS1560 Microcomputer Operating Systems **(Old)**
A+ Computer Operating Systems **(New)**

APPROVE_____OPPOSE_____ MORE INFORMATION_____

ASSOCIATE IN SCIENCE DEGREE
PROGRAM OF STUDY: COMPUTER INFORMATION TECHNOLOGY (25055)
EFFECTIVE TERM: ~~Fall 2008 (2008-1)~~Fall 2009 (2009-1)

EXISTING PROGRAM SHEET SHOWING PROPOSED CHANGES

I. GENERAL EDUCATION REQUIREMENTS

1. COMMUNICATIONS (3.00 credits)

☐ ENC 1101 - English Composition 1 (3 credits)

2. ORAL COMMUNICATIONS (3.00 credits)

☐ SPC 1026 - Fundamentals of Speech Communications (3 credits)

3. HUMANITIES (3.00 credits)

- ☐ PHI 2604 - Critical Thinking/Ethics (3 credits)

4. BEHAVIORAL/SOCIAL SCIENCE (3.00 credits)

- ☐ CLP 1006 - Psychology of Personal Effectiveness (3 credits)

5. MATH/SCIENCE (3.00 credits)

- ☐ MAC 1105 - College Algebra (3 credits)

6. COMPUTER COMPETENCY
Test type(s) needed:

- ☐ CGS 1060 - Introduction to Microcomputer Usage (4 credits)

7. MAJOR COURSE REQUIREMENTS (36.00 credits)

- ☐ CGS 1060 - Introduction to Microcomputer Usage (4 credits)
- ☐ CGS2108 Advanced Desktop Applications (4 credits)
- ☐ CGS 1560 - A+ Computer Operating Systems (4 credits)
- ☐ CEN1301 Supporting Microsoft Clients (4 credits)
- ☐ CEN1511 Networking Technologies or CET1600 Cisco Networking Fundamentals (4 credits)
- ☐ CTS1526 Introduction to Web Page Development (4 credits)
- ☐ CTS1740 A+ Computer Essentials & Support (4 Credits)
- ☐ CTS2154 IT Help Desk Support (4 credits)
- ☐ CTS 2153 Supporting Windows Users & Applications (4 credits)

8. MAJOR COURSE ELECTIVE (12.00 credits)
Must take 12.0 credits from the following group.

- ☐ CET1610, CET2615, CET2620
- ☐ CEN*
- ☐ CGS*
- ☐ CIS*
- ☐ CTS*
- ☐ COP*
- ☐ CAP*

Comment [WCNS1]:

- ☐ ~~Must take 0 course(s) from the following group.~~
  ~~MKA 1161 - * Title Not Found *~~

COLLEGE CREDIT CERTIFICATE
PROGRAM OF STUDY: INFORMATION TECHNOLOGY SUPPORT (66044)
EFFECTIVE TERM: Fall 2009 (2009-1)

PROPOSED CHANGES TO EXISTING CERTIFICATE

1. MAJOR COURSE REQUIREMENTS (28.00 credits)

- CGS 1501 - Microcomputer Wordprocessing (4 credits)
- CGS 1511 - Microcomputer Spreadsheets (4 credits)
- CGS 1541 - Microcomputer Database Management (4 credits)
- CGS 1560 - Using Microcomputer Operating Systems (4 credits)
- CGS 1580 - Microcomputer Desktop Publishing (4 credits)
- CGS 1871 - Introduction to Multimedia (4 credits)
- CTS 2550 - Powerpoint/Outlook (4 credits)

1. MAJOR COURSE REQUIREMENTS (28.00 credits)

- **CTS1134 (formerly CEN1511) Networking Technologies**

or

- **CET1600 CISCO Networking Fundamentals (4 credits)**
- **CTS1328 (formerly CEN1301) Supporting Microsoft Clients (4 credits)**
- **CGS 1560 A+ Computer Operating Systems (4 credits)**
- **CTS1526 Introduction to Web Page Development (4 credits)**
- **CTS1740 A+ Computer Hardware (4 Credits)**
- **CTS2154 IT Help Desk Support (4 credits)**
- **CTS 2153 Supporting Windows Users & Applications (4 credits)**

COLLEGE CREDIT CERTIFICATE
PROGRAM OF STUDY: INFORMATION TECHNOLOGY SUPPORT (66044)
EFFECTIVE TERM: Fall 2009 (2009-1)

PROPOSED NEW PROGRAM SHEET

1. MAJOR COURSE REQUIREMENTS (28.00 credits)

☐ **CTS 1134 (formerly CEN1511) Networking Technologies OR**
CET1600 CISCO Networking Fundamentals (4 credits)

☐ **CTS 1328 (formerly CEN1301) Supporting Microsoft Clients (4 credits)**

☐ **CGS 1560 A+ Computer Operating Systems (4 credits)**

☐ **CTS1526 Introduction to Web Page Development (4 credits)**

☐ **CTS1740 A+ Computer Hardware (4 Credits)**

☐ **CTS2154 IT Help Desk Support (4 credits)**

☐ **CTS 2153 Supporting Windows Users & Applications (4 credits)**

Biomedical Engineering Technology (26053)
Delete Course from program
BSC2020 Human Biology-Fundamentals of Anatomy/Physiology
Substitute with BSC*- any Biology course.

APPROVE_____OPPOSE_____ MORE INFORMATION_____

ASSOCIATE IN SCIENCE DEGREE
PROGRAM OF STUDY: BIOMEDICAL ENGINEERING TECHNOLOGY (26053)
EFFECTIVE TERM: Fall 2009 (2009-1)

PROGRAM SHEET SHOWING PROPOSED CHANGES

I. GENERAL EDUCATION REQUIREMENTS

1. COMMUNICATIONS (3.00 credits)

- ENC 1101 - English Composition 1 (3 credits)

2. ORAL COMMUNICATIONS (3.00 credits)

- SPC 1026 - Fundamentals of Speech Communications (3 credits)

3. HUMANITIES (3.00 credits)

- PHI 2604 - Critical Thinking/Ethics (3 credits)

4. BEHAVIORAL/SOCIAL SCIENCE (3.00 credits)

- CLP 1006 - Psychology of Personal Effectiveness (3 credits)

5. MATH/SCIENCE (3.00 credits)

- MAC 1105 - College Algebra (3 credits)

6. COMPUTER COMPETENCY
Test type(s) needed:

- CGS 1060 - Introduction to Microcomputer Usage (4 credits)

7. MAJOR COURSE REQUIREMENTS (49.00 credits)

- BSC*
- CET 2114C - Digital Computer Circuit Analysis 1 (4 credits)
- CET 2123C - Microprocessors (4 credits)
- CHM 1033 - Chemistry for Health Sciences (3 credits)
- CHM 1033L - Chemistry for Health Sciences Lab (1 credit)
- EET 1015C - Direct Current Circuits (4 credits)
- EET 1025C - Alternating Current Circuits (4 credits)
- EET 1082 - Introduction to Electronics (3 credits)
- EET 1141C - Semiconductor Fundamentals (4 credits)
- EET 2101C - Electronic Devices (4 credits)
- EST 2436C - Biomedical Instrumentation 1 (3 credits)
- EST 2438C - Biomedical Instrumentation 2 (3 credits)
- ETD 1340
- HIM 2472 - Medical Terminology (3 credits)
- MTB 1322 - Technical Mathematics 2 (3 credits)

8. PROGRAM ELECTIVE (4.00 credits)

- CET 2142C - Computers 2 (4 credits)
- EET 1037C - Electronic Computer Simulations (3 credits)
- EET 1142C - Transistor Circuits (4 credits)
- ETD 2350 - Computer Graphics (3 credits)
- MTB 1321 - Technical Mathematics 1 (3 credits)

ASSOCIATE IN SCIENCE DEGREE
PROGRAM OF STUDY: BIOMEDICAL ENGINEERING TECHNOLOGY (26053)
EFFECTIVE TERM: Fall 2009 (2009-1)

PROPOSED NEW PROGRAM SHEET

I. GENERAL EDUCATION REQUIREMENTS

1. COMMUNICATIONS (3.00 credits)

- ENC 1101 - English Composition 1 (3 credits)

2. ORAL COMMUNICATIONS (3.00 credits)

- SPC 1026 - Fundamentals of Speech Communications (3 credits)

3. HUMANITIES (3.00 credits)

- PHI 2604 - Critical Thinking/Ethics (3 credits)

4. BEHAVIORAL/SOCIAL SCIENCE (3.00 credits)

- CLP 1006 - Psychology of Personal Effectiveness (3 credits)

5. MATH/SCIENCE (3.00 credits)

- MAC 1105 - College Algebra (3 credits)

6. COMPUTER COMPETENCY
Test type(s) needed:

- CGS 1060 - Introduction to Microcomputer Usage (4 credits)

7. MAJOR COURSE REQUIREMENTS (49.00 credits)

- BSC*
- CET 2114C - Digital Computer Circuit Analysis 1 (4 credits)
- CET 2123C - Microprocessors (4 credits)
- CHM 1033 - Chemistry for Health Sciences (3 credits)
- CHM 1033L - Chemistry for Health Sciences Lab (1 credit)
- EET 1015C - Direct Current Circuits (4 credits)
- EET 1025C - Alternating Current Circuits (4 credits)
- EET 1082 - Introduction to Electronics (3 credits)
- EET 1141C - Semiconductor Fundamentals (4 credits)
- EET 2101C - Electronic Devices (4 credits)
- EST 2436C - Biomedical Instrumentation 1 (3 credits)
- EST 2438C - Biomedical Instrumentation 2 (3 credits)
- ETD 1340 - Computer Aided Drawing & Design (3 credits)
- HIM 2472 - Medical Terminology (3 credits)
- MTB 1322 - Technical Mathematics 2 (3 credits)

8. PROGRAM ELECTIVE (4.00 credits)

- CET 2142C - Computers 2 (4 credits)
- EET 1037C - Electronic Computer Simulations (3 credits)
- EET 1142C - Transistor Circuits (4 credits)
- ETD 2350 - Computer Graphics (3 credits)
- MTB 1321 - Technical Mathematics 1 (3 credits)

Electrical Power Technology
Add Pre-requisites MAC1105 and PHY1025

Course No.	Course Title	Credits	Campus	Eff. Term
EET1580	Power Plant Science		1,2,3,5,6,7,8	2008-3

Course Description: This course is designed to familiarize students who are preparing for careers in nuclear power plant maintenance technology with the fundamentals of nuclear plant sciences. Students learn about basic electrical science, properties of reactor plant materials, basic

atomic and nuclear physics, heat transfer and fluid flow, reactor safety design, and plant chemistry. Prerequisites: MAC1105, PHY1025. A.S. degree credit only. (2 hr lecture)

Electronics Engineering Technology
Course reclassification from type 02 to 01
Effective Term 2009-2
CET2114C Digital Computer Circuit Analysis 1
CET2123C Microprocessors
CET2142C Advanced Digital Circuits
EET1015C DC Circuits
EET1025C AC Circuits
EET1141C Electronics 1
EET2101C Electronics 2
EET2351C Electronics Communications 2 – Digital

Delete Courses
Effective Term 2009-1
EET2305 FCC License Prep
EET2305C Communications & FCC Exam

Add New Course
Recommended course user fee $55.00

Course No.	Course Title	Credits	Campus	Eff. Term
EET2323C	Electronic Communications 1 – Analog	4	1,2,3,5,6,7,8	2009-2

Course Description: This course is designed for students majoring in Electronics Engineering Technology, Telecommunications Engineering Technology, and related disciplines. Students will learn the principles of radio wave transmission and reception, including AM and FM transmitters, receivers, single sideband, television and digital data transmission lines, wave propagation antennas and microwaves. Prerequisite: EET1141C; Corequisite: EET2101C. Laboratory fee. (2 hr. lecture; 4 hr. lab)

Change Course Numbers/Titles
Pre-Pre-and/or Co-requisite
Effective Term 2009-2

Course No.	Course Title	Credits	Campus	Eff. Term
CET2114C	Digital Computer Analysis 1 (**Old**)	4	1,2,3,5,6,7,8	2009-2
CET1114C	Digital Circuits (**New)**			

Course Description: This is an introductory course in digital circuits for students majoring in engineering technology fields. Students learn how to apply electronic principles to digital computer circuits and systems. Students also learn how to simplify logical circuits using Boolean algebra, build digital circuits, and perform other laboratory activities. Pre-requisite(s): MAC1105. Co-requisite: EET1015C. Laboratory fee. (2 hr. lecture; 4 hr. lab)

Course No.	Course Title	Credits	Campus	Eff. Term
EET2351	Fundamentals of Digital and Data Communications 1 (**Old)**	4	1,2,3,5,6,7,8	2009-2
EET2351C	Electronic Communications 2 – Digital (**New**)			

Course Description: This course is designed to give students majoring in Electronics Engineering Technology and related engineering technologies a theoretical and practical background in the basic concepts and applications of digital and data communications. Students will learn analog-to-digital (A/D) and digital-to-analog (D/A) conversions; data communications codes and standards; wired and wireless digital communications; modulation, transmission impairment, the telephone system, modems, multiplexers, and electrical interface standards. Hands-on laboratory activities are included. Prerequisites: CET 1114C, EET 1025C. Pre/Co-requisite: EET2323C. Laboratory fee. (2 hr. lecture; 4 hr. lab)

Course No.	Course Title	Credits	Campus	Eff. Term
EET1025C	Alternative Current Circuits	4	1,2,3,5,6,7,8	2009-2

Course Description: This is a foundation course in alternating current required for all students in electronics engineering technology and related disciplines. Students will learn vector notation, circuits, impedance, phase shift, networks, transformers, and resonance. Students will apply and verify theories and principles through hands-on, laboratory experiments utilizing modern testing equipment. Prerequisite: EET 1015C; corequisite: MAC1147 or MAC1114or MTB1322. Laboratory fee. (2 hr. lecture; 4 hr. lab)

APPROVE_____OPPOSE_____ MORE INFORMATION_____

ASSOCIATE IN SCIENCE DEGREE
PROGRAM OF STUDY: ELECTRONICS ENGINEERING TECHNOLOGY (26039)
EFFECTIVE TERM: Spring 2010 (2009-2)

PROPOSED CHANGES

I. GENERAL EDUCATION REQUIREMENTS

1. COMMUNICATIONS (3.00 credits)

- ENC 1101 - English Composition 1 (3 credits)

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2. ORAL COMMUNICATIONS (3.00 credits)

- SPC 1026 - Fundamentals of Speech Communications (3 credits)

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3. HUMANITIES (3.00 credits)

- PHI 2604 - Critical Thinking/Ethics (3 credits)

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4. BEHAVIORAL/SOCIAL SCIENCE (6.00 credits)
Must take 3.0 credits from the following group.

- CLP 1006 - Psychology of Personal Effectiveness (3 credits)

- - - And - - -

Must take 3.0 credits from the following group.

- AMH 2010 - History of the United States to 1877 (3 credits)
- AMH 2020 - History of the United States since 1877 (3 credits)
- ECO 2013 - Principles of Economics (Macro) (3 credits)
- POS 2041 - American Federal Government (3 credits)
- WOH 2012 - History of World Civilizations to 1715 (3 credits)
- WOH 2022 - History of World Civilizations from 1715 (3 credits)

The following course(s) are not allowed for credit in this area.
All Labs

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5. MATH/SCIENCE (7.00 credits)

- MAC 1105 - College Algebra (3 credits)
- PHY 2053 - Physics (without Calculus) (3 credits)
- PHY 2053L - Physics (without Calculus) Lab (1 credit)

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6. COMPUTER COMPETENCY
Test type(s) needed:

- CGS 1060 - Introduction to Microcomputer Usage (4 credits)

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7. MAJOR COURSE REQUIREMENTS (38.00 credits)
Must take 30.0 credits from the following group.

- CET1114C Digital Circuits (4 credits)EXISTING COURSE NUMBER CHANGE
- CET 2123C - Microprocessors (4 credits)
- EET 1015C - Direct Current Circuits (4 credits)
- EET 1037C - Electronic Computer Simulations (3 credits)
- EET 1141C - Electronics 1 (4 credits)EXISTING COURSE ALIGN TITLE WITH TITLE IN ODYSSEY
- EET 2101C – Electronics 2 (4 credits) EXISTING COURSE ALIGN TITLE WITH TITLE IN ODYSSEY

☐ CET1114C Digital Circuits (4 credits)EXISTING COURSE NUMBER CHANGE

☐ CET 2123C - Microprocessors (4 credits)

☐ EET 1015C - Direct Current Circuits (4 credits)

☐ EET 1025C - Alternating Current Circuits (4 credits)

☐ EET 1037C - Electronic Computer Simulations (3 credits)

☐ EET 1141C - Electronics 1 (4 credits)EXISTING COURSE ALIGN TITLE WITH TITLE IN ODYSSEY

☐ EET 2101C – Electronics 2 (4 credits) EXISTING COURSE ALIGN TITLE WITH TITLE IN ODYSSEY

☐ MTB 1322 - Technical Mathematics 2 (3 credits)

- - - And - - -

Must take 4.0 credits from the following group.

☐ COP1334 - Introduction to Programming in "C" (4 credits)STATE MANDATED NUMBER CHANGE

☐ CGS 2423 - "C" For Engineers (4 credits)

The following course(s) are not allowed for credit in this area.
All Labs

- - - And - - -

Must take 4.0 credits from the following group.

☐ **REMOVE FROM ODYSSEY**
EET2323C Electronic Communications 1 (4 credits)ADD NEW COURSE

EXISTING COURSE; NUMBER CHANGE; NEW COMPETENCIES; MOVE TO ELECTIVES
CET2142C – Advanced Digital Circuits (4 credits) EXISTING COURSE;

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8. OTHER ELECTIVES (8.00 credits)

☐ CET 1171 - Micro-Computer Service and Maintenance 1 (3 credits)

☐ CET 1172C - Micro-Computer Service and Maintenance 2 (3 credits)

☐ CET 2142C - Advanced Digital Circuits (4 credits)

☐ EET 1082 - Introduction to Electronics (3 credits)

☐ EET 1949 - Co-op Work Experience 1: EET (3 credits)

☐

☐ EET2323C Electronic Communications 1 (4 credits) ADD NEW COURSE

☐ EET2351C – Electronic Communications 2 (4 credits)EXISTING COURSE NUMBER CHANGE

Biotechnology (22027)
Course Reclassification from type 02 to 01
Change Course Number
Effective Term 2009-2
Campus: 1,2,3,5,6,7,8
ETI1181 Introduction to Quality Assurance
EET1172 (**New**)

APPROVE_____OPPOSE_____ MORE INFORMATION_____

3. Social Science Discipline

Revised Course Description

Course No.	Course Title	Credits	Campus	Eff. Term
AMH2010	History of the United States to 1877	3	1,2,3,5,6,7,8	2009-1

Course Description: Students will learn of the history of the United States to 1877 by examining the founding, growth, and development of America from the colonial era through Reconstruction. (3 hr. lecture)

Course No.	Course Title	Credits	Campus	Eff. Term
AMH2020	History of United States since 1877	3	1,2,3,5,6,7,8	2009-1

Course Description: This course focuses on the social, economic, cultural, and political developments in the United States since 1877. The student will gain knowledge of changes and continuities in the history of the United States since the late nineteenth century. (3 hr. lecture)

Course No.	Course Title	Credits	Campus	Eff. Term
WOH2012	History of Civilizations to 1789	3	1,2,3,5,6,7,8	2009-1

Course Description: This course covers the history of World Civilizations from the prehistoric period to the 18th century. Students will learn the major political, social, economic, and cultural structures of civilizations and their development through 1789. (3 hr. lecture)

Course No.	Course Title	Credits	Campus	Eff. Term
WOH2022	History of Civilizations since 1789	3	1,2,3,5,6,7,8	2009-1

Course Description: The student will examine the historical development of world civilizations since 1789. Students will learn of historical processes and developments in social, cultural, political, and economic contexts since the late 18th century (3 hr lecture).

APPROVE_____OPPOSE_____ MORE INFORMATION_____

Course Deletion
Effective Term 2009-1
SLS1310 Introduction to Health Careers
Rationale: Course has been deleted from State Numbering System and has not been offered at MDC since 2005-1

APPROVE_____OPPOSE_____ MORE INFORMATION_____