



**SCHOOL OF ENGINEERING**

**MINOR PROGRAMS OF STUDY**

Approved November 2008

## MINORS IN THE SCHOOL OF ENGINEERING

Specialization has become an increasingly important aspect of engineering practice. It is often advantageous for School of Engineering graduates to have both a balanced education in one of the traditional disciplines and specialized training in a specific area complementary to that discipline.

In recognition of this trend, the School of Engineering has a program of minors which, in some cases, may be pursued as the technical electives of your current engineering or engineering technology curricula. The minors program serves the needs of the student by providing options which open avenues of study to fulfill specific educational goals/career objectives.

Election of a minor is strictly at the student's option and does not affect the present credit hour requirements for graduation. This is typically done at the beginning of the student's junior year. There is no penalty for discontinuing a minor program of study provided the unfulfilled balance of free and technical electives are taken in accordance with current degree requirements. Successful completion of a minor will be recorded by its formal title on the student's official transcript.

A minor consists of at least 12 semester hours of coursework sequenced such that the program of study can be completed in the third and fourth years of study. The first course in each minor will usually satisfy any prerequisite requirements for subsequent courses in that minor. Moreover, the first course will usually provide the necessary technical background needed by those students entering the program from other engineering disciplines. The courses in a minor are taken for **undergraduate credit, grading option 1 only**. Courses required for the minor may not be offered every term.

To designate a minor, the *Request for Approval of a Minor* form, page 18 of this booklet is available in the Office of the Dean of Engineering (KL 266), and should be completed by the student and signed by the chair of the School of Engineering department offering the minor. The form should then be submitted to the Office of the Dean, KL 266. When the minor has been successfully completed, the dean will notify the Registrar's Office, and the minor will become a part of the student's permanent record. In some instances, it may be beneficial to the student to substitute courses in an approved minor program. Such changes can be submitted on the *Request for Approval of a Minor* form and must be approved by the student's advisor, appropriate department chairperson, and the dean.

An undergraduate student who wishes to complete a minor in an area outside of the School of Engineering may do so by completing the course designed by the department offering the minor.

Detailed descriptions of the School of Engineering minors are provided in this brochure. It is anticipated that additional minors will evolve on a continuing basis from faculty-student endeavors. A special minor, not listed, can be created with the approval of the advisor, the chairperson offering the minor, and the School of Engineering Academic Committee.

The 18 minors presently available to engineering students are as follows:

<b>Title</b>	<b>Open to the Following Majors</b>	<b>Page</b>
Aerospace Engineering	CEE, CME, MEE	10
Bioengineering	All	3
Chemical Processing	CEE, CPE, ELE, MEE	3
Composite Materials Engineering	CEE, CME, MEE	4
Computer Systems	CEE, CME, MEE	8
Design and Manufacturing Engineering	All	10
Dynamic Analysis of Mechanical Systems	CEE, MEE	9
Engineering Management	All	11
Engineering Mechanics	All	6
Environmental Engineering	All Non-CEE Majors	6
Materials Engineering	All	4
Mechanics of Engineering Systems	CEE, CME, CPE, ELE	9
Operations Engineering	All	12
Polymer Materials	All	5
Signals and Systems	CEE, CME, MEE	8
Structures	All Non-CEE Majors	6
Transportation Engineering	All Non-CEE Majors	7
Water Resources Engineering	All Non-CEE Majors	7

The 8 minors available to engineering technology students are as follows:

<b>Title</b>	<b>Open to the Following Majors</b>	<b>Page</b>
Electronic & Computer Engineering Technology	All Non EET Majors	13
Engineering Management	All	11
Engineering Technology	All Non-SoE Majors	14
Industrial Engineering Technology	All Non-IET Majors	15-16
Manufacturing Engineering Technology	All Non-MFG Majors	16
Mechanical Engineering Technology	All Non-MCT Majors	17
Operations Engineering	All	12
Quality Assurance	All	16

## I. ENGINEERING

### A. CHEMICAL AND MATERIALS ENGINEERING

#### 1. *Title: Bioengineering (BIE)*

Description: This is open to chemical, civil, computer, electrical, and mechanical engineering majors. The program is designed to expose the student to the use of engineering principles in the biological systems and applications.

Courses:

Three required courses:

BIO 151	Concepts of Biology I or BIO 152 Concepts of Biology II
CME 490	Introduction to Bioengineering
CME 491	Biomedical Engineering

One of the following electives:

BIO 151	Concepts of Biology I
BIO 152	Concepts of Biology II
BIO 312	General Genetics
BIO 403	Physiology I
BIO 411	General Microbiology
BIO 440	Cell Biology
CHM 420	Biochemistry
CHM 451	General Biochemistry I
CHM 452	General Biochemistry II
CME 492	Chemical and Bio Sensors

#### 2. *Title: Chemical Processing (CHP)*

Description: This minor is open to civil, computer, electrical, and mechanical engineering majors. The program is designed to acquaint the student with industrial operations in the chemical process industries such as heat exchange, distillation, extraction, humidification, etc. The elective courses cover a wide range of topics to accommodate the student's special interests.

Courses:

CME 203	Material and Energy Balances
CME 365	Separation Processes

Any of the following:

CME306/CME406	Chemical Reaction Kinetics Engineering
CME 430	Chemical Engineering Design I
CME 452	Process Control
CME 465	Fluid Flow and Heat Transfer Processes
CME 499	Special Problems in Chemical Engineering

### 3. *Title: Composite Materials Engineering (CMA)*

Description: This minor is open to civil, chemical, and mechanical engineering majors. The program is designed to expose the student to the design, processing, and characterization of composite materials and their various applications in industry.

Courses:

Four of the following courses:

CME/MAT 509	Introduction to Polymer Science - Thermoplastics
CME 510	High Performance Thermostat Polymers
or	
MAT 510	High Performance Thermostat Polymers
CME 512/MAT 542	Advanced Composite Materials and Processing
CME/MAT 527	Methods of Polymer Analysis
CEE/MAT 540	Composite Design
CEE/MAT 541	Experimental Mechanics of Composite Materials
CEE/MAT 543	Analytical Mechanical-Composite Materials
CEE/MAT 544	Mechanics of Composite Structures

### 4. *Title: Materials Engineering (MAT)*

Description: This minor is open to all engineering majors. This minor is a general overview of materials with elective courses in polymers, composites, nanomaterials, and material characterization.

Students receiving a Materials Engineering Minor will be required to take four of the following courses.

MAT 501	Principles of Materials I
MAT 502	Principles of Materials II
MAT 504	Techniques of Materials Analysis
MAT 505	Thermodynamics of Solids
MAT 507	Introduction to Ceramic Materials
MAT 508	Principles of Material Selection
MAT 509/CME 509	Introduction to Polymer Science - Thermoplastics
CME 510	High Performance Thermostat Polymers
or	
MAT 510	High Performance Thermostat Polymers
MAT 511/CME 511	Principles of Corrosion
MAT 513	Advanced Magnetic Materials
MAT 521	Nondestructive Evaluation
MAT/CME 527	Methods of Polymer Analysis
MAT 542/CME 512	Advanced Composites
MAT 541	Experimental Mechanics of Composite Materials
MAT 543	Analytical Mechanics of Composite Materials
MAT 544	Mechanics of Composite Structures
CME/MAT 579	Materials for Advanced Energy Applications
MAT 590	Selected Readings in Materials Engineering
MAT 595	Special Problems in Materials Engineering
MAT 604	Nanostructured Materials
MEE 312	Engineering Materials I
MEE 505	Thermodynamics of Solids

**5. Title: Polymer Materials (PME)**

Description: This minor is open to all engineering majors. Coverage of polymers including thermosets and thermoplastics and composite materials in which polymers are used as constituents. Methods of polymer processing and polymer characterization are also included.

Required Courses:

CME/MAT 509	Introduction to Polymer Science - Thermoplastics
CME510	High Performance Thermostat Polymers
or	
MAT 510	High Performance Thermostat Polymers

Select two of the following courses:

MAT 526	
CME/MAT 527	Methods of Polymer Analysis
CME/MAT 528	Chemical Behavior of Materials
MAT 540	Composite Design
MAT 541	Experimental Mechanics of Composite Materials
CME 512/MAT 542	Advanced Composites
MAT 543	Analytical Mechanics of Composite Materials
MAT 544	Mechanics of Composite Structures

**B.. CIVIL AND ENVIRONMENTAL ENGINEERING AND ENGINEERING MECHANICS**

**1. Title: Engineering Mechanics (EME)**

Description: This minor is open to all engineering majors. The program provides a broad treatment of engineering mechanics including theoretical, numerical, and experimental topics.

Courses:

Any four of the following not already required.

EGM 303	Mechanics II
EGM 445	Finite Element Applications
CEE/EGM 503	Introduction to Continuum Mechanics
CEE/EGM 533	Theory of Elasticity
CEE/EGM 546	Finite Element Analysis I
MEE 504	Fundamentals of Fluid Mechanics
CEE/EGM 511	Experimental Stress Analysis
CEE/MAT/EGM 540	Composite Design
EGM/CEE/MAT 541	Experimental Mechanics of Composite Materials
EGM/CEE/MAT 543	Analytical Mechanics of Composite Materials
EGM/CEE/MAT 544	Mechanics of Composite Structures

**2. Title: Environmental Engineering (EVE)**

Description: This minor, which is open to all non-civil engineering majors. The program defines contemporary problems of pollution and identifies the technological approaches necessary to preserve the quality of our environment.

Courses: Any four of the following not already required. It is recommended the minor include one course pertaining to water, air, and solid.

CEE 390	Environmental Pollution Control (not permissible for CME students)
CEE 434	Water & Wastewater Engineering
CME/CEE 562	Physical & Chemical Water & Wastewater Treatment Processes
CME/CEE 563	Hazardous Waste Engineering
CME/CEE 564	Solid Waste Engineering
CME/CEE 574	Fundamentals of Air Pollution Engineering I
CME/CEE 575	Fundamentals of Air Pollution Engineering II
CME/CEE 576	Environmental Engineering Separation Processes
CHM 341	Environmental Chemistry

### 3. *Title: Structures (STR)*

Description: This minor is available to all non-civil engineering majors. The program provides a broad coverage to general concepts of structural design as applied to buildings, mechanical systems and machinery.

Courses: Any four of the following:

CEE 311L	Civil Engineering Materials Lab
CEE 316	Analysis of Structures I
CEE 411	Design of Steel Structures
CEE 412	Design of Concrete Structures
CEE 500	Advanced Structural Analysis
CEE 501	Structural Analysis by Computers
CEE 502	Prestressed Concrete
CEE 504	Structural Dynamics
CEE 505	Plastic Design in Steel
CEE 507	Masonry Design
CEE 508	Design of Timber Structures
CEE 524	Foundation Engineering
CEE 540	Composite Design

**4. Title: Transportation Engineering (TRE)**

Description: This minor is open to all non-civil engineering majors. The program provides broad coverage in the planning, design, operations and management of the transportation system.

Courses: Any four of the following not already required:

CEE 403	Transportation Engineering
CEE 515	Pavement Engineering
CEE 550	Highway Geometric Design
CEE 551	Traffic Engineering
CEE 558	Traffic Engineering Research
CEE 552	Intelligent Transportation Systems
CEE 595	Special problems in Civil Engineering

**5. Title: Water Resources Engineering (WRE)**

Description: This minor is open to all non-civil engineering majors. The program and provides broad coverage to the general concepts used in water resources engineering including hydraulics and hydrology issues within economic, optimization, operation, and management frameworks.

Courses: Any four of the following not already required:

CEE 313	Hydraulics
CEE 333	Water Resources Engineering
CEE 580	Hydrology and Seepage
CEE 582	Advanced Hydraulics
CEE 584	Open Channel Flow
CEE 595	Special Problems in Civil Engineering



## C. ELECTRICAL and COMPUTER ENGINEERING

### 1. *Title: Computer Systems (COS)*

Description: This minor is open to chemical, civil, and mechanical engineering majors, and other students with appropriate prerequisite background who receive permission from the ECE Department Chair. The program builds strength in the area of computer systems and digital design, with emphasis on computer hardware.

Courses for non-MEE majors:

ECE-215/215L	Introduction to Digital Systems & Lab <sup>1</sup>
ECE-314	Fundamentals of Computer Architecture
ECE 201L <sup>2</sup>	Circuit Analysis & Laboratory
EGR 203 <sup>2</sup>	Electrical and Electronic Circuits

One from:

ECE-444	Advanced Digital Design
or CPS-150	Algorithms and Programming I (or equivalent)

Courses for MEE majors:

CPS-150	Algorithms and Programming I (or equivalent)
ECE-215/215L	Introduction to Digital Systems & Lab.
ECE-314	Fundamentals of Computer Architecture
ECE-444	Advanced Digital Design

### 2. *Title: Signals and Systems (SAS)*

Description: This minor is open to chemical, civil, and mechanical engineering majors, and other students with appropriate prerequisite background who receive permission from the ECE Department Chair. The program provides the essential background in signals and systems theory including continuous and discrete systems. An advanced course is selected by the students to allow them to specialize in controls or signal processing.

Courses:

ECE 203	Intro to MATLAB Programming
ECE-303/303L	Signals and Systems & Lab <sup>1</sup>
ECE 201L <sup>1</sup>	Circuit Analysis & Laboratory
EGR 203 <sup>1</sup>	Electrical and Electronic Circuits
ECE-334	Discrete Signals and Systems <sup>2</sup>

One from:

ECE-415	Control Systems
or ECE-445	Signal Processing

<sup>1</sup>ECE 323/323L can be substituted for ECE 201L and EGR 203

## D. MECHANICAL ENGINEERING

### 1. *Title: Mechanics of Engineering Systems (MES)*

Description: This minor is open to chemical, civil, computer, and electrical engineering majors. The program provides for additional study in basic mechanics with emphasis in dynamics. This knowledge can be applied to design of machines, vehicles, and structures.

Courses: Any four of the following, not already required:

EGM 303	Mechanics II
MEE 321	Theory of Machines
MEE 427	Mechanical Design I
MEE 428	Mechanical Design II
MEE 436	Vehicle Performance Analysis
MEE 499	Special Problems related to Mechanics only
MEE 503	Introduction to Continuum Mechanics
MEE 527	Automatic Control Theory
MEE 546	Finite Element Analysis I

### 2. *Title: Dynamic Analysis of Mechanical Systems (DAS)*

Description: This minor is open to civil and mechanical engineering majors. The program provides study in the general area of dynamics, and is designed to give the student a broad understanding of mechanical systems and their use in machinery, vehicles, structures, etc. MEE students must select at least three courses that are not part of their required program.

Courses: Any four of the following:

MEE 321	Theory of Machines
MEE 428	Mechanical Design II
MEE 436	Vehicle Performance Analysis
MEE 499	Special Problems related to Dynamic Analysis or Controls
MEE 527	Automatic Control Theory
MEE 535	Advanced Mechanical Vibrations
MEE 536	Random Vibrations
EGM 519	Analytical Dynamics

**3. Title: Aerospace Engineering (AAE)**

Description: This minor is open to chemical, civil, and mechanical engineering majors. The program provides a strong background for career specialization in the fields of aircraft and aerospace engineering.

Courses: Any four of the following:

MEE 225	Introduction to Flight
MEE 401	Aerodynamics
MEE 409	Aerospace Structures
MEE 413	Propulsion
MEE 425	Aerospace Design
MEE 432L	Multidisciplinary Engineering Design Laboratory II
MEE 440	Flight Vehicle Performance
Or	
MEE 439	Dynamic Systems and Controls

Any AEE graduate course (w/approval)

**4. Title: Design and Manufacturing Engineering (DME)**

Description: This minor is open to all engineering majors. The program provides the concepts of mechanical design, manufacturing processes, statistical quality control, robotics, and flexible, integrated, and automated manufacturing systems.

Courses:

MEE 312 & MEE 312L	Engineering Materials I and Lab
MEE 427	Mechanical Design I
MEE 431L	Multidisciplinary Engineering Design Laboratory I

And any three of the following:

MEE 428	Mechanical Design II
MEE 434	Mechatronics
MEE 438	Robotics and Flexible Manufacturing
MEE 499	Special Problems related to Design or Manufacturing
MEE 545	Computational Methods for Design
MEE 580	Stat Proc Control by Feedback Adj
MEE 585	Design for Producibility
ISE 421	Introduction to Operations Research
ISE 460	Quality Assurance

## E. ENGINEERING MANAGEMENT

### 1. *Title: Engineering Management (ENM)*

Description: This minor is open to all engineering and engineering technology majors. Completion of this minor will provide the student with understanding of basic concepts relevant to the management of engineering operations. Students who anticipate moving from technical to managerial positions during their careers may wish to consider this minor.

Required Courses:

ENM 505	Management of Engineering Systems
ENM 530/ISE 430	Engineering Economy

Additional Courses: Students will select two courses from the following list:

ENM 500/ISE 300	Probability and Statistics for Engineers
-----------------	--

or

MSC 521/ISE 421 <sup>1</sup>	Introduction to Operations Research
------------------------------	-------------------------------------

or

ENM 534 <sup>1</sup>	Decision Making
ENM 560/ISE460 <sup>1</sup>	Quality Assurance
ENM 565/ISE465 <sup>1</sup>	Reliability Engineering I
MSC 572 <sup>1</sup>	System Simulation

ENM 515	Human Factors Engineering
ENM 539	Systems Engineering/Project Management
MSC 555/ISE 455	System Dynamics I
ENM 582	Engineering Organizational Development

<sup>1</sup>ENM 500 (ISE 300 or MTH 367) is a prerequisite

## 2. Title: Operations Engineering (OPE)

Description: This minor is open to all engineering and engineering technology majors. Completion of this minor will provide the student with a strong foundation in the analytical tools needed to plan, design, optimize, and manage complex engineering operations. Students who anticipate moving into problem-solving and decision-support roles during their engineering careers may wish to consider this minor.

### Required Courses:

ENM 500/ISE 300	Probability and Statistics for Engineers
or	
MTH 367	Statistical Methods 1
MSC 521/421 <sup>1</sup>	Introduction to Operations Research

Additional Courses: Students will select one course from each of the following two sets.

### Set 1:

ENM 560/ISE 460 <sup>2</sup>	Quality Assurance
ENM 561/ISE 461 <sup>2</sup>	Design and Analysis of Experiments
ENM 565/ISE 465 <sup>2</sup>	Reliability Engineering
MSC 572 <sup>2</sup>	System Simulation

### Set 2:

MSC 522/ISE 422 <sup>3</sup>	Topics in Operations Research
MSC 523	Nonlinear Optimization
ENM 541/ISE 441 <sup>3</sup>	Production Engineering
MSC 555/ISE 455	System Dynamics I

<sup>1</sup>ENM 500 (ISE 300 or MTH 367) is a co requisite

<sup>2</sup>ENM 500 (ISE 300 or MTH 367) is a prerequisite

<sup>3</sup>MSC 521 (ISE 421) is a prerequisite

## II. ENGINEERING TECHNOLOGY

### A. ELECTRONIC ENGINEERING TECHNOLOGY

#### 1. *Title: Electronic and Computer Engineering Technology (ECT)*

Description: This minor is open to all other majors. It is also available for other majors within the University if certain prerequisites have been met. Any combination of four 3-credit hour ECT lecture courses making a total of 12 hours may in some cases constitute a minor in EET. Laboratories are recommended but not required with the exception that ECT 357L must be taken to accompany the lecture ECT 357. Certain combinations of courses are suggested as an arrangement to meet specific student interests.

Courses:

Select four ECT courses

Required Courses:

ECT 120	Electrical Circuits II
ECT 224/224L	Digital Computer Fundamentals (ECT 224)
	Digital Computer Fundamentals Laboratory (ECT 224L)

Complete required courses plus two (2) additional ECT courses not already required for student's major

ECT Analog Devices Emphasis

Complete required courses plus:

ECT 206/206L	Electron Devices I (ECT 206)
	Electron Devices I Laboratory (ECT 206L)
ECT 306/306L	Electron Devices II (ECT 306)
	Electron Devices II Laboratory (ECT 306L)

ECT –Microprocessor Emphasis

Complete required courses plus:

ECT 357/357L	Microprocessors I (ECT 357)
	Microprocessors I Laboratory (ECT 357L)
ECT 358-358L	Microprocessors II (ECT 358)
	Microprocessors II Laboratory (ECT 358L)

ECT – Software Emphasis

Complete required courses plus:

ECT 361	Programming Structures
ECT 362	Concepts and Applications of Computer Operating Systems

Note: To ensure adequate time to complete the minor, students should begin taking courses in the junior year. This would allow for the courses that require prerequisites, within the minor, to be properly sequenced.

## B. ENGINEERING TECHNOLOGY

### 1. *Title: Engineering Technology (NGT)*

Description: This minor is open to students enrolled in majors in the College of Arts & Sciences, the School of Business Administration, and the School of Education and Allied Professions with the appropriate prerequisite background and approval of the Engineering Technology Department Chair. The course content has been selected to introduce the principles of applied engineering and complements many majors at eh University. Fifteen (15) credits are required for the minor.

Prerequisites: SET 153L Technical Computation Laboratory (1 cr.) or equivalent competency  
MTH 137 Calculus I with Review, Part I (4 cr.) or equivalent competency

Courses Required (12 cr.)

ECT 110	Electrical Circuits I
IET 323	Project Management (3 cr.)
MCT 110L	Technical Drawing and CAD
MFG 204/204L	Materials and Processes and Lab (

Select one (1) course from the following list (3 cr.):

ECT 120	Electrical Circuits II
ECT 224	Digital Computer Fundamentals
ECT 361	Programming Structures
IET/ISE 408	Lean Management Methods
IET 317	Industrial Economic Analysis
IET 435	Human Factors
IET/ISE 415	Management of Technical Organizations
MFG 426	Automated Manufacturing Systems & CIM
MFG 432	Plastics, Composites, and Nano Materials and Processes
MFG 434	Robotics and Computer Numerical Control
MCT 220	Statics & Dynamics
MCT 231	Fluid Mechanics

## C. INDUSTRIAL ENGINEERING TECHNOLOGY

### 1. *Title: Industrial Engineering Technology (IET)*

Description: This minor is open to all majors except industrial engineering technology. The program provides a concentration in the industrial field that will complement the student's major field of study. Twelve credit hours of industrial courses in addition to any that are required for the student's major constitute a minor in industrial engineering technology. All prerequisites and corequisites must be followed.

Courses: Any four of the following not already required in a student's program of study:

IET 230	Work Measurement and Lab
IET /ISE 408	Lean Management Methods
IET 317	Industrial Economic Analysis
IET 318	Statistical Process Control
IET 319	Quality Improvement Methods
IET 320	Quality Assurance Techniques
IET 321	Quality Management
IET 435	Human Factors
IET 332	Facilities Layout Design
IET/ISE 415	Management of Technical Organizations
IET 418	Cost Estimating
IET 420	Industrial and Environmental Safety
IET 425	Elements of Cost Control

The following are suggested course selections emphasizing different areas with IET:

#### **Human Performance Emphasis**

Description: This indicates an emphasis in the field of human performance including ergonomics, job design and safety.

Courses:	
IET 230	Work Measurement
IET 435	Human Factors
IET/ISE 415	Management of Technical Organizations
IET 420	Industrial and Environmental Safety

#### **Production Management Emphasis**

Description: This indicates an emphasis in the field of production management, including facilities layout and cost estimating.

Courses:	
IET 230	Work Measurement
IET/ISE 408	Lean Management Methods
IET 318	Statistical Process Control
IET 332	Facilities Layout Design
IET 418	Cost Estimating
IET 420	Industrial and Environmental Safety



**2. Title: Industrial Engineering Technology (IET) (continued)**

**Cost Management Emphasis**

Description: This indicates an emphasis in the field of cost management, including cost analysis and cost estimating.

Courses:

IET 317	Industrial Economic Analysis
IET/ISE 415	Management of Technical Organizations
IET 418	Cost Estimating
IET 425	Elements of Cost Control

**2. Title: Quality Assurance (QUA)**

Description: This minor is open to all students. The program provides a concentration in the field of quality control, quality assurance, and quality management. Upon successful completion of this minor, the student will have command of statistical quality tools as well as the breadth of quality management concepts and experience in practical application of the tools. All prerequisites and corequisites must be followed.

Courses:

IET 318	Statistical Quality Control
IET 319	Quality Improvement Methods
IET 320	Quality Assurance Techniques
IET 321	Quality Management

**D. MANUFACTURING ENGINEERING TECHNOLOGY**

**1. Title: Manufacturing Engineering Technology (MFG)**

Description: This minor is open to all engineering technology majors except manufacturing. The minor indicates a concentration in manufacturing that will complement the student's major field of study. All prerequisites and corequisites must be followed.

Courses: Any four of the following not already required:

MFG 204 and MFG 204L	Materials and Processes and Lab
MFG 240	Manufacturing and Product Design
MFG 424	Robotics
MFG 426	Automated Manufacturing Systems and CIM
MFG 431	Controls for Industrial Automation
MFG 432	Plastics, Composites, and Nano Materials and Processes
MFG 434	Robotics and Computer Numerical Control
MFG 435	Advanced Numerical Control

## E. MECHANICAL ENGINEERING TECHNOLOGY

### 1. *Title: Mechanical Engineering Technology (MCT)*

Description: This minor is open to all engineering technology majors except mechanical. The program provides a concentration in the mechanical field that will complement the student's major field of study. Twelve credit hours of mechanical courses in addition to any that are required for the student's major constitute a minor in mechanical engineering technology. All prerequisites and corequisites must be followed.

Courses: Any four of the following not already required:

MCT 221	Strength of Materials
MCT 231	Fluid Mechanics
MCT 313	Industrial Mechanisms
MCT 330	Design of Machine Elements
MCT 336 and 336L	Fluid Power and Lab (concurrently)
MCT 342	Thermodynamics
MCT 423	Product Development
MCT 430	Design of Fluid Power Systems
MCT 432	Heat Power
MCT 438	Heat Transfer
MCT 440	Applied Vibrations
MCT 445 and 445L	Experimental Mechanics and Lab (concurrently)
MCT 446	Applied Finite Element Modeling

**REQUEST FOR APPROVAL OF A MINOR**

**UNIVERSITY OF DAYTON  
SCHOOL OF ENGINEERING**

Name \_\_\_\_\_ Student ID No. \_\_\_\_\_

Academic Department in Engineering \_\_\_\_\_

Title of Minor \_\_\_\_\_

<i>Course Number</i>	<i>Course Title</i>

If it is necessary or desirable to change the minor program of study, a separate sheet must be submitted for approval by the Associate Dean.

Remarks:

Approval:

\_\_\_\_\_  
Adviser

\_\_\_\_\_  
Chair of School of Engineering Department Offering the Minor

Original: Student File  
Copy: Student, Advisor File