



University of Dayton

**School of
Engineering**

Recommended Minors in CME

As part of the requirements for the CME degree, the following electives can be used to satisfy a minor.

Chemistry/Biology Elective	3 credit hours
Chemical Engineering Elective	3 credit hours
Engineering/Science Elective	3 credit hours
Engineering/Science Elective	3 credit hours

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

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/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

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 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 565	Fundamentals of Combustion
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

Pre-Med Preparation for Engineering Students:

The courses required by the majority of medical schools include:

Note: See a pre-med adviser for further approval

BIO 151	Concepts of Biology I: Cell and Molecular Biology	3 Cr. Hrs.
BIO 151L	Biological Laboratory Investigations I: Cell Molecular Biology	1 Cr. Hr.
BIO 152	Concepts of Biology II: Evolution and Ecology	3 Cr. Hrs
BIO 152L	Biological Laboratory Investigations II: Evolution and Ecology	1 Cr. Hr.
CHM 123 and 123L*	General Chemistry I and Lab	4 Cr. Hrs.
CHM 124 and 124L*	General Chemistry II and Lab	4 Cr. Hrs.
PHY 206*	General Physics I	3 Cr. Hrs.
PHY 207*	General Physics II	3 Cr. Hrs.
PHY 201L*	General Physics Laboratory (A higher level engineering lab may be substituted.)	1 Cr. Hr.
CHM 313 and 313L*	Organic Chemistry I and Lab	4 Cr. Hrs.
CHM 314 and 314L*	Organic Chemistry II and Lab	4 Cr. Hrs.

* Already part of the CME sequence

It is recommended that a student take a course in physiology and a course in microbiology.
For Chemical Engineering Students:

BIO 411	General Microbiology	3 Cr. Hrs.
BIO 403	Physiology I	3 Cr. Hrs.

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

CME 509/MAT 509	Introduction to Polymer Science - Thermoplastics
CME 510/MAT 510	High Performance Thermostat Polymers
CME/MAT 511	Principles of Corrosion
MAT 513	Advanced Magnetic Materials
MAT 521	Nondestructive Evaluation
CME/MAT 527	Methods of Polymer Analysis
CME 512/MAT 542	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

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
CME/MAT 510	High Performance Thermostat Polymers

Select two of the following courses:

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

Concentration in Energy Systems

Description: The Energy Systems Concentration provides an interdisciplinary concentration in energy systems and its social consequences. Students completing this concentration would find themselves prepared for jobs in both industrial and building energy systems, the market for which has been growing rapidly.

Students in the Energy Systems Concentration would be required to take the following courses:

Core CME Courses

CME 203 – Materials and Energy Balances
CME 311 – Chemical Engineering Thermodynamics
CME 324/325/326L – Transport Phenomena I, II and lab
CME 465 – Fluid Flow and Heat Transfer
CME 466L – Unit Operations Lab
CME 430/431 – Design I and II

CME Elective (Choose 1 from the list below)

CME 486/586 – Petroleum engineering
CME 524/MEE 575 – Fundamentals and Applications of Fuel Cells
CME 565 – Fundamentals of Combustion
CME 574 – Fundamentals of Air Pollution Engineering I

Technical Electives (Choose 2 of the following if not chosen for CME elective)

CME 486/586 – Petroleum engineering
CME 524/MEE 575 – Fundamentals and Applications of Fuel Cells
CME 565/MEE 560 – Fundamentals of Combustion
CME 574 – Fundamentals of Air Pollution Engineering
MAT 590 – Energy Materials
MEE 420/569 – Energy Efficient Buildings
MEE 471/571 – Design of Thermal Systems
MEE 474/574 – Energy Efficient Manufacturing
MEE 472/572 – Renewable Energy Systems
CME 507/MEE 511 – Advanced Thermodynamics
MEE 413/513 – Propulsion
AEE/MEE 565 – Advanced Propulsion Systems
MEE 590 – Aviation and Jet Fuels

The students must in addition to an Ethics course take

ASI 321 – Cities and Energy (satisfies History requirement) or other approved humanities elective connected to Energy Systems