

MECHANICAL ENGINEERING

Mechanical Engineering

Collaborative Program

Major

	MAJOR
Hours Required in Engineering:	66
Hours Required in Other Departments:	40
Total Hours Required:	106

Coordinator:

Julie Yi-Zun Wang,
Professor, Department of Physics
and Engineering

- A collaborative program between Frostburg State University and the University of Maryland, College Park, which allows students to remain on the Frostburg campus for four years while receiving a B.S. degree in mechanical engineering from UM,CP.
- This program is accredited by the Accreditation Board for Engineering and Technology (ABET).
- The degree awarded to students completing the program is a B.S. from UM,CP. Therefore, students enrolled in the collaborative program must complete UM,CP's general education program requirements.
- During the freshman and sophomore years, you will be enrolled as a pre-engineering major. You will complete general education and engineering science courses taught by faculty on-site at FSU. FSU tuition rates will apply.
- After completing 45 credits of designated course work, you must apply for admission to College Park's Clark School of Engineering. After meeting UM,CP's admissions standards, you will be accepted into the second half of the program as an engineering major. UM,CP's tuition rates will apply for this part of the program. You must reapply for financial aid and scholarships through UM,CP.
- Upper level engineering courses will be delivered over interactive video from College Park to FSU. All laboratory and design courses will be taught by FSU faculty.
- UM,CP requires completion of one Human Cultural Diversity course, focusing on one or more of the following: a) the history, status, treatment, or accomplishment of women or minority groups and subcultures; b) non-Western culture; c) concepts and implications of

Mission Statement

The mission of the FSU Collaborative Mechanical Engineering Program is to provide excellent undergraduate education in mechanical engineering; to establish close partnership with and provide technical knowledge to industry, government, and local business; to contribute to economic development within the state of Maryland, specifically in the Western Maryland region; and to provide related services to the campus community and community at large.

Program Educational Objectives

The Frostburg Collaborative Mechanical Engineering Program will graduate engineers who have

1. Broad knowledge of mathematics, physical science, and engineering science with emphasis in selected specialization areas of mechanical engineering to be successful in government, industry, private companies, and graduate schools.
2. Professional skills to function in multidisciplinary teams, use modern engineering tools and computer software, solve engineering problems, engage in design work or research, and communicate with professionals.
3. An understanding of professional responsibility to evaluate their ethical obligations to society, employers, employees, and their peers.
4. Motivation for life-long learning to update their technical knowledge and understanding of societal and contemporary issues.

Program Outcomes

The students of the Mechanical Engineering Collaborative Program will demonstrate throughout the curriculum

- a. an ability to apply knowledge of mathematics, science, and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data
- c. an ability to design a system, component, or process to meet desired needs
- d. an ability to function on multi-disciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively
- h. the broad education necessary to understand the impact of mechanical engineering solutions in a global and societal context
- i. a recognition of the need for and an ability to engage in life-long learning
- j. a knowledge of contemporary issues in mechanical engineering
- k. an ability to use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice

Summary of UMCP's General Education Program Requirements

Minimum of 43 credit hours required

Fundamental Studies Requirements

1. English (6 hours)

ENGL 101/111 Freshman Composition - *must be attempted within first 30 credits & passed within first 60*

ENGL 338 Technical Writing or ENGL 339 Scientific Writing - *must be taken after you have completed 56 credits/junior standing*

2. Mathematics (3-4 hours)

Any MATH 100 or 200 level course except MATH 206, MATH 207, MATH 103 and MATH 104.

Must be attempted by 30 credits, completed by 60-credit level.

MATH 236 Calculus I, required under the engineering major, fulfills this requirement.

Distributive Studies Requirements

1. Arts and Humanities (9 hours)

ENGL 150/250 Introduction to Literature

and one History/Theory of the Arts course from the following:

ART 100/111 Art Appreciation or ART 110 Visual Imagery

MUSIC 110 Intro. to World Music or MUSC 117 Music of Africa, Asia and the Americas

THEA 106 Intro. to Theatre

DANC 110 Dance Appreciation

One additional Arts and Humanities course from the above History/Theory of the Arts list or any philosophy course.

diversity. If you complete either MUSC 110, MUSC 117 or DANC 110 under Distributive Studies, these courses would also fulfill your diversity requirement. In addition, there are a number of 300-400 level courses that can be taken to fulfill both the Advanced Studies and Diversity requirement. Please consult with your advisor for a listing of approved courses.

- To be granted advanced placement credit for a course, you must meet UM,CP's minimum requirements. These differ from FSU's standards, with a higher score required by UM,CP in a number of areas. Please consult the Engineering Coordinator to verify AP scores required to receive credit.
- Advanced Studies courses should be taken only after completing 56 credits/entering junior standing.

2. Mathematics and Natural Sciences (10 hours)

The mathematics and sciences requirements are fulfilled by courses completed for the engineering program.

3. Social Sciences (9 hours)

HIST 100/111 The Contemporary World in Historical Perspective
and two behavioral and social science courses from the following:
POSC 110/112 Introduction to American Politics
POSC 113/114 Introduction to World Politics
ECON 200 Basic Economics or ECON 201/211 Princ. of Econ.
GEOG 104/114 Human Geography
PSYC 150/151 General Psychology
SOC 100/111 Introduction to Sociology

Advanced Studies Requirements

Two courses (6 credits) required:

Must be 300-400 level courses taken after 56 credits. Students may substitute an approved senior capstone course in their major taken after 86 credits for one of the two required Advanced Studies courses. The other course **must** be outside the major. The following may not be used to fulfill Advanced Studies requirements:

- Professional Writing courses
- Courses used to meet Distributive Studies requirements
- Internships or other experiential learning types of courses
- Courses taken on a pass/fail basis

One independent studies course (*minimum of three credits, outside the major*) may be used toward Advanced Studies requirements as long as it is consistent with the rules above and approved by the Engineering Coordinator.

Summary of Pre-Engineering Requirements

1. Engineering Science Courses (12 hours)

ENES 100 Introduction to Engineering Design
ENES 102 Statics
ENES 220 Mechanics of Materials
ENES 221 Dynamics

2. Required Courses in Other Departments

(40 hours)

CHEM 133 General Chemistry for Engineers (*preferred*)
or CHEM 202 General Chemistry II
CHEM 201 General Chemistry I (*Meets GEP requirement*)
ENGL 101 Freshman Composition (*Meets GEP requirement*)
ENGL 339 Scientific Writing or ENGL 338 Technical Writing
(*Meets GEP requirement*)
MATH 236 Calculus I (*Meets GEP requirement*)
MATH 237 Calculus II
MATH 238 Calculus III
MATH 432 Differential Equations
PHYS 261 Principles of Physics I: Mechanics (*Meets GEP requirement*)
PHYS 262 Principles of Physics II: Electricity and Magnetism
PHYS 263 Principles of Physics III: Sound and Light

Summary of Engineering Requirements

1. Required Engineering Courses (36 hours)

ENME 232 Thermodynamics
ENME 350 Electronics and Instrumentation I
ENME 271 Numerical Methods in Mechanical Engineering
ENME 331 Fluid Mechanics
ENME 332 Transfer Processes
ENME 351 Electronics and Instrumentation II
ENME 361 Vibration, Controls and Optimization I
ENME 371 Product Engineering and Manufacturing
ENME 462 Vibration, Controls and Optimization II
ENME 382 Engineering Materials and Manufacturing Processes
ENME 392 Statistical Methods for Product and
Process Development
ENME 472 Integrated Product and Process Development
(*Capstone*)

2. Elective Hours in Department (18 hours)