Mechanical Engineering

COLLABORATIVE PROGRAM MAJOR

Coordinator: Julie Wang, 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 UMCP.
- This program is accredited by ABET.
- The degree awarded to students completing the program is a B.S. from UMCP.
- During the first-year 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 UMCP’s admissions standards, you will be accepted into the second half of the program as an engineering major. UMCP’s tuition rates will apply for this part of the program. You must reapply for financial aid and scholarships through UMCP.
- 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.
- To be granted advanced placement credit for a course, you must meet UMCP’s minimum requirements. These differ from FSU’s standards, with a higher score required by UMCP in a number of areas. Please consult the Engineering Coordinator to verify AP scores required to receive credit.

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

A few years from graduation, the graduates of the Collaborative Mechanical Engineering Program will:

1. Act as valuable employees or professionals in a broad range of career paths centered on Mechanical Engineering skills.
2. Apply their broader analytical skill set through finding innovative solutions to real-world problems and creating new knowledge, ideas, and products.
3. Show professionalism and an ability to think globally through constructive teamwork, group problem solving, and effective communication with others not of an engineering background.
4. Demonstrate ethical decision-making, which will lead to increased levels of responsibility and leadership positions.
5. Engage in life-long learning by keeping their technical knowledge and understanding of contemporary issues up-to-date and taking advantage of professional development opportunities.

Program Outcomes

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

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
Program Requirements

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<tr>
<th>MAJOR</th>
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<tbody>
<tr>
<td>Hours Required in Engineering:</td>
<td>68</td>
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<tr>
<td>Hours Required in Other Departments:</td>
<td>40</td>
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<tr>
<td>Total Hours Required:</td>
<td>108*</td>
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*Note: A minimum of 120 credits and satisfactory completion of all department, college and university requirements must be satisfied to earn a degree from UMCP.

Summary of UMCP’s General Education Program Requirements

- The University of Maryland will accept completion of FSU’s General Education Program.
- Minimum of 40 credit hours required

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 (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, Waves and Oscillations (Meets GEP requirement)
   - PHYS 262 Principles of Physics II: Thermodynamics, Electricity and Magnetism
   - PHYS 263 Principles of Physics III: Light and Modern Physics

After completing 45 credits of designated course work, you must apply for admission to College Park’s Clark School of Engineering.

ADMISSION CRITERIA

To be eligible for fall 2019 admission to the Collaborative Program at UMD, students must meet the following criteria by the end of the spring 2019 semester:

- A minimum cumulative GPA of 3.0 on all college level coursework
- Completion of MATH 237 (Calc II) with a minimum grade of B or better
- Completion of PHYS 261 (Physics I) with a minimum grade of B or better
- Completion of CHEM 202 or CHEM 133 (Chemistry for Engineers or Chemistry II) with a minimum grade of C or better

Admission notes:

- Only one of the above listed “gateway” courses may be repeated to earn the required grade, and that course may only be repeated once.
- Students with more than 60 credits may still apply. Regardless of your credit level at transfer, this program is designed to be completed in a minimum of three full-time fall/spring semesters.
- Students on F-1 or J-1 Visas are not eligible for this program.

Summary of Engineering Requirements

1. Required Engineering Courses (41 hours)
   - ENME 232 Thermodynamics
   - ENME 271 Numerical Methods in Mechanical Engineering (will satisfy MATH 206)
   - ENME 272 Introduction to Computer-Aided Design
   - ENME 331 Fluid Mechanics
   - ENME 332 Transfer Processes
   - ENME 350 Electronics and Instrumentation I
   - ENME 351 Electronics and Instrumentation II
   - ENME 361 Vibration, Controls and Optimization I
   - ENME 371 Product Engineering and Manufacturing
   - ENME 382 Engineering Materials and Manufacturing Processes
   - ENME 392 Statistical Methods for Product and Process Development
   - ENME 400 Machine Design
   - ENME 462 Vibration, Controls and Optimization II
   - ENME 472 Integrated Product and Process Development (Capstone)

2. Elective Hours in Department (15 hours)