

MECHANICAL ENGINEERING



UMBC'S B.S. IN MECHANICAL ENGINEERING

UMBC's **B.S. in Mechanical Engineering**, an ABET-accredited program, is committed to excellence in research and education. It also offers distinct undergraduate experiences in design realization through:

- The Society of Automotive Engineers Mini Baja build and competition
- Competitions sponsored by the American Society of Mechanical Engineers
- Industry-sponsored, real-world capstone design projects
- Special research opportunities offered to undergraduate students each year

Students can augment their coursework and gain practical engineering experience through applied internships or co-ops. Higher-level courses cover fundamental principles in the areas of solid mechanics, thermal-fluids, and design and manufacturing systems. Laboratory and elective courses provide students the opportunity to test these principles and apply them individually and as teams in projects that involve industry design challenges in areas like material processing, energy conversion, and aerospace.

"My undergraduate professors at UMBC not only prepared me with the knowledge but also the confidence necessary to be successful in engineering. I find myself continuously using the fundamentals of classes such as materials, circuits, and machine design."

- Shelbi Tippett '18, mechanical engineering
Operations Manager for Stanley Black & Decker

REQUIRED TRANSFER COURSEWORK

Admission to the mechanical engineering program at UMBC-Shady Grove is contingent upon successful completion of required prerequisite courses (across various academic disciplines) in addition to the following gateway requirements:

- Introduction to Engineering, Statics, and Calculus II must be completed with a grade of "B" or better.
- Introduction to Chemistry (Chemistry 101) must be completed with a grade of "C" or better.

Students are permitted to retake two of the gateway courses one time to earn the required grade.

Enrolling in a gateway course at UMBC or another institution is considered an attempt.

For full details on these requirements, visit the "Required Courses and Prerequisites" section of our website at shadygrove.umbc.edu/program/mechanical-engineering.

Please reach out to usgmeadvising@umbc.edu to schedule a pre-transfer advising appointment for further support and guidance.

MEET THE DIRECTOR

"Do you want to contribute to making systems more efficient and sustainable for society? Are you interested in how things work? Do you take things apart to understand their inner workings? Consider a degree in mechanical engineering!"

I have been fascinated by mechanical systems ever since I can remember. As a preschooler, I would ask my dad to take me to the observation deck at the airport to watch planes take off and land. I earned degrees in naval architecture, aeronautics, and astronautics, and I conduct research in biomedical engineering.

The application of fluid mechanics to the design process is common across these professions. As a mechanical engineer, you will learn fundamental skills that can be applied across almost every industry and you will find that you have the ability to express your creativity within the design process."

– Dr. Charles Eggleton
Program Director,
Mechanical Engineering at UMBC-Shady Grove

TEACHING STYLE: Promotes student learning and content retention by engaging students in classroom activities. Students develop their problem-solving skills and learn to think like engineers by proposing and discussing solutions to problems in an open environment.

PROFESSIONAL PAST: Joined the Mechanical Engineering Department at UMBC in January 1998. Served as the undergraduate program director for three years and participated in the implementation of online tools that enabled students to audit their academic progress. Served as Department Chair from 2012 through 2017. Acted as an academic advisor to over a hundred students.

ACADEMIC AREAS OF FOCUS: Taught or co-taught undergraduate courses in the thermal-fluids track. Research involves using software to simulate flow over biological cells in order to understand the role of hydrodynamic forces on cellular adhesion to surfaces.

INTERESTING FACT: I'm not sure if I can say English is my first language. Growing up in California my mother spoke to me in Spanish. Right before starting the first grade, I lived in Mexico for over six months and forgot how to speak English when I returned home. Having lived in Maryland for over 25 years, I speak mostly English and I'm always looking for opportunities to speak in Spanish.

Questions about the Mechanical Engineering Program?

Contact Dr. Charles Eggleton at eggleton@umbc.edu or visit our website.



DR. CHARLES EGGLETON

Program Director,
Mechanical Engineering at
UMBC-Shady Grove

EXPLORE MECHANICAL ENGINEERING AT UMBC

To learn more about the B.S. in Mechanical Engineering at UMBC at the Universities at Shady Grove, visit shadygrove.umbc.edu/program/mechanical-engineering.

MECHANICAL ENGINEERING CAREER PATHS



Mechanical engineering is one of the oldest and broadest engineering disciplines. Traditionally, a mechanical engineer would be the expert in the production and usage of heat and mechanical power which are critical in the design, production, and operation of machinery. Today, mechanical engineers have taken on an expansive and critical role across all fields – from automobiles to energy to medical devices – and in the advancement of new technologies, such as nano-technologies and MEMS (Micro Electro Mechanical Systems).

As an undergraduate mechanical engineering student at UMBC-Shady Grove, you will gain a broad base of skills and knowledge that will prepare you for a wide variety of industrial applications. Importantly, you will have the option to explore valuable career opportunities before graduation through internships and co-ops.



AT



shadygrove.umbc.edu

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MECHANICAL ENGINEERING INDUSTRY PATHS

Examples of Industries:

TRANSPORTATION

- Transportation Industry Consultant
- Automotive Engineer
- Transportation Engineer
- Aerospace Engineer

ENERGY

- Thermal Engineer
- Solar Engineer
- Energy Specialist
- Applications Engineer

PRODUCTION OPERATIONS

- Plant Engineer
- Test Engineer
- Process Engineer
- Applications Engineer

MACHINES/MECHANICAL DESIGN

- Mechanical Engineer
- Mechanical Design Engineer
- Design Engineer

HEALTH

- Biomechanics Engineer
- Sanitary Engineer
- Public Health Engineer

OPERATIONS RESEARCH / MODELING

- Research Assistant
- Analyst Assistant
- Market Forecaster

PURCHASING & MATERIALS MANAGEMENT

- Operations Research Analyst
- Assistant Buyer
- Traffic Manager
- Inventory Manager
- Line Supervisor
- Production Manager
- Assistant Quality Assurance Manager
- Purchasing Agent
- Contract Agent/Manager
- Industrial/Wholesale Buyer
- Purchasing Price Analyst
- Cost Estimator

GOVERNMENT

- Project Engineer
- NIST Mechanical Engineer
- Peace Corps Volunteer
- Patent Reviewer
- Mechanical Engineer

HUMAN RESOURCES

- Technical Recruiter
- High Tech Head Hunter

PUBLISHING

- Technical Writer
- Editorial Assistant

SALES / MARKETING

- Sales Engineer
- Technical Sales Rep.
- Trade Show Organizer
- High Tech Marketing Specialist
- Product Engineer
- Technical Representative
- Applications Engineer
- Product Manager
- Market Research Analyst

A NOTE FROM OUR PROGRAM DIRECTOR



Charles Eggleton

Program Director

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(410) 455-3317

I've always been interested in how things work and just amazed that we can build planes, rockets and satellites. My K-12 education spanned the late 60s and the 70s and I was inspired to dream by the lunar landings and the space shuttle.

If you are interested in Mechanical Engineering you may be curious about how things work or want to contribute to producing products that benefit society. Maybe a personal experience with a relative, friend or someone you know motivates your interest artificial limbs and organs. You may enjoy hands-on projects in shop class and renovating older cars or houses. You may be concerned about the environment and want to design systems to be more energy efficient. Whatever motivates you, know that mechanical engineers are a diverse group of people with a wide range of backgrounds and motivations. What we all have in common is our ability to apply physical principles to the design and manufacture of products for society.

My personal path began with pursuing a degree in naval architecture - the design of ships and boats - followed by graduate degrees in aeronautics and astronautics. Applying the skills acquired through these degrees, I advise students in my lab conducting research projects involving flow over

biological cells. I have been a faculty member at UMBC for over 20 years and I have served in both the role of Undergraduate Program Director and Department Chair. I look forward to meeting with you and helping you launch your career path in mechanical engineering.



THE UNIVERSITIES AT SHADY GROVE

Mechanical Engineering Opportunities in Maryland, DC, and Northern Virginia

92% OF UMBC
MECH ENG GRADS
ARE EMPLOYED
WITHIN **6** MONTHS

96% OF UMBC
MECH ENG GRADS
ARE IN POSITIONS
RELATED TO THEIR
CAREER GOALS

85% OF UMBC
MECH ENG GRADS
ENGAGED IN APPLIED
LEARNING WHILE IN
COLLEGE



EXAMPLES OF ALUMNI JOBS

Patent examiner - Patent Attorney
Applications Engineer
Associate Mechanical Engineer
Design Engineer
Quality Engineer
Engineering Physics Teacher
STEM Program Analyst
Defense Engineer
Executive Director
Thermal Engineer
Senior Systems Engineer
Space Systems Engineer
Aerospace Engineer
Research Development Mechanical Engineer
Program Manager
Professor

..... and
\$ 70K-75K
MEDIAN STARTING SALARIES



NOTABLE
COMPANIES
HIRING OUR
MechE GRADUATES

StanleyBlack&Decker

NORTHROP GRUMMAN



GENERAL DYNAMICS



SAIC

BAE SYSTEMS

BGE

An Exelon Company



LOCKHEED MARTIN

1 MECHANICAL ENGINEERING PROGRAM

..... at

2 LOCATIONS



Learn More

UMBC at The Universities at Shady Grove

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