

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

One of the largest, leading materials programs in the country, the Department of Materials Science and Engineering at The Ohio State University aims to transform how materials are synthesized, developed, processed, characterized and joined. We translate this innovation into educational experiences that expose students to state-of-the-art experimental and computational techniques, delivering the required preparation and skills to be leaders in the materials industry and academia.

The department's facilities span five campus buildings with advanced equipment to synthesize materials for biological, corrosive, electronic, energy and structural applications; to characterize their structure, properties and performance; and to join them using welding, frictional and other innovative methods. The Department of Materials Science and Engineering resides in Mars G. Fontana Laboratories, which opened in August 2020 after a \$59.1 million renovation. To learn about phase two of the renovation, visit go.osu.edu/phase2.

RANKINGS

Our undergraduate and graduate programs, including an online master's program in welding engineering, are consistently ranked in the top 25 nationally by *U.S. News and World Report*. Undergraduate students enjoy a student-to-faculty ratio of 12:1, dedicated full-time academic advisors, and opportunities to participate in research, summer internships, co-ops, global education opportunities, and professional societies and meetings. The graduate student experience includes state-of-the-art experimental and computational research facilities, interdisciplinary research, national and international collaborations, and teaching and mentorship options. The majority of our graduate students are supported by graduate research associate positions that provide for tuition, stipend and research costs.

ACADEMICS

The department offers ABET-accredited BS, MS and PhD degrees in materials science and engineering (MSE) and welding engineering (WE).

A MS in welding engineering is also available in a distance learning format. The BS/MS program provides an accelerated path to complete the combined requirements for BS and MS degrees, and an Integrated Business & Engineering Honors Program bundles a BS in MSE or WE with a minor in business. All undergraduate students participate in a senior capstone experience in which student teams tackle open-



ended engineering problems that involve materials synthesis, characterization, joining and performance/property evaluation.

AUTUMN 2020 ENROLLMENT

Undergraduate students (218 MSE, 133 WE) 351

Graduate students (125 MSE, 99 WE) 224

DEGREES CONFERRED (2019-2020)

Bachelor of Science (72 MSE, 64 WE) 136

Master of Science (30 MSE, 23 WE) 53

Doctor of Philosophy (19 MSE, 6 WE) 25

RESEARCH

The department supports more than \$17 million in research expenditures each year. Focus areas with dedicated faculty include biomaterials (3); computational modeling (8); corrosion (4); electronic, optical and magnetic materials (11); materials performance (9); materials processing and manufacturing (9); mechanical properties and responses to deformation (9); microstructure and property relationships in materials (10); superconductors (1); and welding engineering (14). We continue to realize new opportunities for faculty hiring and research growth. These areas include materials for biomedical applications; structural applications, including extreme environments; manufacturing, including novel additive and joining techniques; mobility, including lightweighting and propulsion; and energy applications, including harvesting, conversion and storage. Department research facilities include:

- Center for Accelerated Maturation of Materials (CAMM)
- Center for Electron Microscopy and Analysis (CEMAS)
- Center for Performance and Design of Nuclear Waste Forms and Containers (WastePD)
- Center for Superconducting and Magnetic Materials (CSMM)
- Fontana Corrosion Center (FCC)
- Manufacturing and Materials Joining Innovation Center (Ma2JIC)

The department is active in many multidisciplinary centers, see go.osu.edu/multidiscipline.





FACULTY

The department is one of the largest in the nation, with 36 tenure-track faculty, four clinical-track faculty and six research-track faculty, plus four joint faculty with primary appointments in chemical, electrical, mechanical and biological engineering as well as architecture and plastic surgery. Together, we offer expertise in teaching and research that spans the materials spectrum—ceramics, metals, polymers, biomaterials, semiconductors and composites. Materials applications span from sustainable energy production, conversion and storage to biological, corrosive, electronic, magnetic and structural needs.

ALUMNI

Known, living MSE and WE alumni worldwide.....5,337

EMPLOYMENT AND INTERNSHIPS

The average starting salary for students with a BS in MSE or WE is about \$67,700 per year. Approximately 85% of students participate in an internship, co-op, research or part-time related work experience before graduation. The average internship or co-op wage is \$19 per hour. Students with a MS or PhD earn proportionately higher salaries.

DIVERSITY

The department is committed to building and maintaining a diverse community. Students from 10 countries study here and we continue to increase the number of underrepresented minorities* and embrace opportunities to do so. The percentage of women has increased to 31.8% in MSE and 17.7% in WE since 2014. Underrepresented minorities have doubled since 2014 to 10.5% in MSE and 13.4% in WE.

* underrepresented minority = African American, Hispanic, American Indian/Alaskan Native and those who identify as two or more races

HISTORY AND TRADITION

The department has a long tradition that originated in the formation of the Department of Geology, Mining and Metallurgy in 1873 and the Department of Ceramics in 1894. The latter was the first in the U.S. to confer a technical degree in ceramics. These departments evolved over time into the Department of Metallurgical Engineering and Department of Ceramic Engineering, respectively. They merged in 1988 to form the Department of Materials Science and Engineering. The Welding Engineering Program was established in 1948. In 2010, it was transferred to the Department of Materials Science and Engineering to leverage the synergy between the disciplines. Today, the BS degree in WE is the only ABET-accredited degree in welding engineering in the U.S.

GLOBAL OPTIONS

The department seeks to provide students and professionals with options to apply their engineering skills in a global context. At the undergraduate level, the Global Option in Engineering provides the opportunity to co-op or intern outside the U.S. At the professional level, the Master of Global Engineering Leadership program partners with the Fisher College of Business and the John Glenn College of Public Affairs to offer concentrations in MSE and WE, including an option in additive manufacturing.

CONTACTS

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Undergraduate Programs in MSE and WE

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Master of Global Engineering Leadership

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