What is Materials Science and Engineering?

If you enjoy math, physics, and chemistry, if you like making things and want to apply your skills to benefit society, then Materials Science and Engineering might be the field for you.

Throughout history, the emergence of new materials has repeatedly enabled dramatic advances in technology. In today’s society new and better materials engender developments in energy technology, sustainability, transportation, information technology, communication, and medicine to name a few.

Materials Science and Engineering is the one field devoted exclusively to finding new materials and new ways of making materials perform better. Materials scientists study the structure of materials starting at the atomic level. They study how to synthesize and process materials to change their internal structure. Materials Scientists study how this structure affects properties, and they apply all of this knowledge to make materials better.

The MS&E undergraduate curriculum at UW Madison provides students with a fundamental core knowledge, but it also allows them to design their own areas of ‘emphasis’ or specialization, with help from an advisor. Commonly chosen emphasis areas include:

- Metals
- Biomaterials
- Nanomaterials
- Electronic, Optical, and Magnetic Materials
- Polymers
- Structural Materials
- Computational Materials Science

General Information:

Our student numbers are growing but we remain one of the smallest departments in the College of Engineering. Hands-on lab classes contain fewer than 12 students, and intimate environment allows for a rapport between individual students and faculty.

Due to the department’s size, curriculum flexibility, world-class research opportunities, and an overall increasing interest in materials, MS&E is currently one of the most rapidly growing departments in the College of Engineering.

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Where Do Our Graduates Go?

The density map above shows where students entering industry have gone after graduating from the department in years between 1993 and 2013. Since 2009, 64% of graduates currently work in Wisconsin or surrounding states, while 36% work in other states or countries.

What Do Our Graduates Do For Work

Between 1993 and 2013, 82% of UW-Madison MS&E graduates went directly into industry, while another 16% pursued graduate degrees, teaching, or government jobs.

MS&E GRADUATES 1993-2013

Major employers of graduates include companies like Intel, Caterpillar, Boeing, 3M, GE, and Texas Instruments (see histogram, left).

Between 2006 and 2008, industries that hire the most MS&E graduates from UW-Madison are semiconductor, non-metallic manufacturing, metal application, polymer, metals production, aerospace, and paper industries in that order.

Average starting salary (2012-2013) was $60,200, typical of most engineering degrees.

What Are Our Students’ Interests?

From a student survey given in Fall 2013, the top 5 areas of interest for incoming students are nanomaterials, polymers, biomaterials, metallurgy, and electronic materials. These fall within the range of emphasis areas and research opportunities available to undergraduates.

To help support students meet their interests, the student-run, Undergraduate Student Advisory Board was established in 2013 to recommend possible new elective courses. Already, this committee has helped to create courses in Corrosion, Invention and Entrepreneurship, and Art and Materials.

Other, long-standing student organizations include Materials Advantage and the American Foundry Society. These act in conjunction with one another to offer evening seminars and hands-on exploratory sessions in 3D printing, CAD, Metal Casting, and Welding. In addition to club socials, field trips and guest speakers, these organizations work to foster student communication outside of class.