MATERIALS SCIENCE & ENGINEERING
UNIVERSITY of WASHINGTON
College of Engineering

What Do Materials Scientists and Engineers Do?

Materials science and engineering is an interdisciplinary field where the scientific fundamentals of materials, their structure and properties, and their design and processing for real world applications are explored. Materials scientists and engineers select materials for a wide range of applications, develop new materials, improve materials properties, lower their processing cost, and increase their durability. They can make metals lighter and stronger, ceramics tougher, polymers degradable, and composites affordable.

Examples of materials science research and applications development occurring in the MSE department include developing biomaterials for tissue engineering; composites and metals for aerospace; ceramics for energy applications; computational techniques for materials development; eco-materials for green technologies; genetically engineered molecules and semiconductors for electronics; magnetic materials for information storage/processing, biomedicine and energy conversion; and polymers for telecommunications and solar energy.

Professional Opportunities in MSE

Materials scientists and engineers work in a variety of fields, either directly after finishing undergraduate study or after attending graduate school for a Master's degree or a Ph.D. Employment opportunities for undergraduate student graduates are available in all categories below. We also send many students to graduate school in MSE and other engineering and related disciplines; in recent years we have also sent students to medical school and prosthetics and orthotics graduate school. *Employers and work listed here are just a sample of activities of recent graduates.*

Air & space – materials testing, manufacturing, processes, physics, coatings/finishes: *Aerojet Rocketdyne, Boeing, Blue Origin, Crane Aerospace, Honeywell, LMI Aerospace, Janicki Industries, NASA, Space X, US Air Force pilot.*
Computing, data, & digital technologies – data science, data analytics, materials simulation modeling, software development: *Analog Devices (ADI), Apple, AT &T, HCL Technologies, Infosys, Intel, Micron, Microsoft, Shin-Etsu America, The Spur Group*
Environment, sustainability, & energy – all parts of the clean energy sector, waste management, battery development: *Cupertino Electric, Microsoft nLIGHT, Pacific Northwest National Laboratory, Sedron Technologies, Washington Clean Energy Testbeds*
Health & medicine – medical devices, tissue engineering, health and medical research and development: *Cardiac Dimensions, EKOS Corporation, NanoString Technologies, Neoleukin Therapeutics, nLIGHT, Rocket Science Health , UW School of Medicine*
Infrastructure, transportation, & society – materials, airplanes, submarines, sporting goods and fabrics, STEM education, user experience: *Crane Currency, Pacific Northwest National Laboratory, Promethean, Samsung Electronics, University of Washington, Uphill Designs, W.L. Gore.*
Robotics & manufacturing – product development, tools, materials, structures, processes, reliability, durability, failure analysis, 3D printing, all aspects of the manufacturing process: *Applied Materials, Boeing, Cascade Gasket, Crane Aerospace, Fluke Corporation, Honeywell, General Dynamics, GM Nameplate, Intel, Jorgensen Forge Corporation, Laurence Livermore National Laboratory, Microsoft, nLIGHT, Romac Industries, Shin-Etsu America, Spuncast Inc., Toray Composite Materials America, W.L. Gore.*

Introductory MSE courses available to current UW Students

Students currently at the UW who are deciding if MSE is right for them have three introductory courses available: (1)MSE 170: Fundamentals of Materials Science (4 credits, graded) offered every quarter; (2) MSE 298: Introduction to Modern Materials (1 credit, CR/NC) offered in Fall and Spring; (3) MSE 398: MSE Leadership Seminar (1 credit, CR/NC, may be repeated over multiple years), offered Winter quarter.

Degree Options and Concentration Areas

MSE offeres one Bachelor's degree: A Bachelor of Science in Materials Science and Engineering. A formal (transcripted) Degree Option is available in Nanoscience and Molecular Engineering. Informal elective Concentration Areas are currently available in Manufacturing and Industry, Electronic/Optical Materials, Energy/Environment Materials, Biomedical Materials, Structural Materials, and Data Science .

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Admission and Enrollment Requirements

Valid for UW Students who are not ENGRUD majors, and all Transfer Applicants to the UW

ALL PROSPECTIVE STUDENTS APPLY AFTER WINTER QUARTER OF THEIR SOPHOMORE YEAR

The following courses must be completed by the department application deadline, April 5th

Subject	Quarter Credits	UW Course Equivalencies
Calculus	15	MATH 124, 125, 126
General Chemistry for Science and Engineering with lab (2 quarters)	10	CHEM 142, 152
Calculus-based Physics with lab (1st and 2nd quarter)	10	PHYS 121, 122
English Composition	5	ENGL 131 or other composition course

The following courses must be completed by the start of the Autumn quarter of MSE enrollment

Subject	Quarter Credits	UW Course Equivalencies
Differential Equations	3	MATH 307
Fundamentals of Materials Science	4	MSE 170
A computer programming course for Science and Engineering students	4	Either AMATH 301 OR CSE 142

To graduate on time, all applicants are also encouraged to have completed the following courses prior to the beginning of your enrollment: UW's AA 210 (Statics), CEE 220, (Mechanics of Materials) , PHYS 123 (3rd quarter calculus –based Physics with lab), ENGR 231 (Introduction to Technical Communication/Writing), and MATH 308 (Matrix/Linear Algebra).
Completing one year of general Chemistry is strongly encouraged for prospective transfer applicants so the courses transfer correctly to the UW.

Transfer applicants without MSE 170 completed (as the course is not readily available) will still be able to apply ; however, if admitted, MSE 170 must be completed Autumn quarter with their other MSE Core courses, for a total of 17 credits.

Application Deadline: April 5, for Autumn quarter admission. Transfer students must first apply to the UW before applying to MSE. Autumn quarter transfer student application deadlines to the UW are earlier: current deadline is **February 15 . Transfer applicants must be accepted to both the UW and to MSE to be admitted to MSE. Admissions is Competitive**: To be eligible to be considered for admission each course required for application must be completed with a minimum grade of 2.0; the minimum cumulative GPA for all courses required is a 2.5.

For More information

****All Students and applicants should meet with MSE Advising as early as possible to discuss the application process****

MSE Web Site, which includes more admissions information: https://www.mse.washington.edu
Contact Information: Sandra Maddox (Undergraduate Advisor); askmse@uw.edu; 206-616-6581
Schedule Advising Appointments: https://sbmaddox.youcanbook.me

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