

Metallurgical Engineering

Metallurgical engineering is a specialty area of materials science that involves a study of the structure, properties, processing and performance of metals. You will learn about the extraction of metal from minerals, wastes, and recycled materials, the design of metallic materials that possess desired mechanical, physical and chemical properties and the production of components from selected metals and alloys.

Missouri S&T has one of the few metallurgical engineering programs in the United States that offers instruction in the entire spectrum of metallurgical activities.

The department trains future industrial and academic leaders in metallurgical engineering by providing a comprehensive, forward-looking and broad-based curriculum, which emphasizes fundamental principles, practical applications, oral and written communication skills as well as professional practice and ethics. The department is distinguished by a nationally recognized graduate program that emphasizes research while providing a stimulating educational environment.

Available Emphasis Areas

Students may choose a technical specialty area as part of their metallurgical engineering degree.

- Chemical/Process Metallurgy
- Physical Metallurgy
- Manufacturing Metallurgy

Student Organizations

The Missouri S&T metallurgical engineering program sponsors two separate student organizations and a departmental honor society:

- Material Advantage is the student affiliate of ASM International, Association for Iron and Steel Technology, The Materials Society of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the American Ceramic Society.
- Student Chapter of the American Foundry Society
- Alpha Sigma Mu is the Materials Engineering honor society

Outstanding Teaching and Research

All instruction within the metallurgical engineering program is by full-time Ph.D. faculty. Student teaching evaluations consistently place the department well above the campus average. Eleven faculty members supervised over \$2.4 million in funded research, providing research opportunities not only for graduate students but also a number of undergraduates.

Co-op and Internship Availability

Co-op and summer intern programs are available to students. These programs provide students with the opportunity to integrate their classroom studies with learning through productive work experiences in a field related to a student's academic or career goals. Work for a semester or during the summer and build your resume.

Scholarship Information

Freshman scholarships are automatically awarded based on high school transcripts and ACT/SAT scores. No separate application is necessary. All freshman engineering students who list metallurgy as their preference when applying will receive a \$500-\$3,500 per year departmental scholarship based on a combination of high school academic standing, ACT/SAT scores and extracurricular activities. The \$500-\$3,500 per year departmental scholarships are adjusted annually based on academic performance and progress towards a metallurgical engineering degree. There are many opportunities for additional scholarships for metallurgy students.

Departmental Contact Information

Department Chair:	Dr. Wayne Heubner
573-341-4711	223 McNutt Hall
mse.mst.edu	matlsci@mst.edu

Faculty

Professors:

Wayne Huebner, Ph.D., Missouri S&T (Chair)
 Matthew O'Keefe, Ph.D., Illinois
 Von Richards, Ph.D., Michigan
 Mark Schlesinger, Ph.D., Arizona
 David Van Aken (Curators'), Ph.D., Illinois

Associate Professors:

Joseph Newkirk, Ph.D., Virginia

Assistant Professors:

Mohsen Asle Zaeem, Ph.D., Washington State
 Caizhi Zhou, Ph.D., Iowa State

Teaching Professor:

F. Scott Miller, Ph.D., Missouri S&T (Assoc. Chair)

Emeritus Faculty:

Ronald Kohser, Ph.D., Lehigh
 David Robertson, Ph.D., New South Wales

Top Hiring Employers

- Boeing
- G.E.
- Toyota, Ford, and GM
- Caterpillar and John Deere
- Honeywell
- Nucor
- Alcoa
- ArcelorMittal
- Scott Forge
- Lindberg

Facilities and Technology

Instructional laboratories include a working foundry, mechanical testing equipment, light and scanning electron microscopy laboratories, heat-treating facilities and a variety of other laboratories. Labs are constantly updated with new equipment including a new focus ion beam scanning electron microscope and an inclusion analyzer obtained during the last year.

Notes

Detailed information on course equivalencies, acceptable credits for elective coursework, grade requirements and prerequisites is available from S&T's Registrar's Office at registrar.mst.edu.

All metallurgical engineering students must take the Fundamentals of Engineering Examination prior to graduation. A passing grade is not required; however, this is the first step to becoming a registered professional engineer.

Bachelor of Science

Metallurgical Engineering 128 credit hours

Entering freshmen desiring to study metallurgical engineering are admitted to the Freshman Engineering Program. They may, however, state a Metallurgical Engineering preference, which will be used as a consideration for available freshman departmental scholarships. The focus of the Freshmen Engineering program is on enhanced advising and career counseling with the goal of providing to the student the information necessary to make an informed decision.

FIRST YEAR

Credit

Chemistry 1310,1319-General Chemistry w/ Lab.....	5
English 1120-Exposition.....	3
FE 1100-Careers in Engineering.....	1
MechE 1720-Engineering Design	3
Math 1214-Calculus for Engineers I.....	4
Math 1215-Calculus for Engineers II.....	4
Met Eng 1210-Chemistry of Materials.....	3
Physics 1135-Engineering Physics I.....	4
Elective/Humanities or Social Science.....	3
Elective/History.....	3
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SECOND YEAR

CivE 2200-Engr Mech/Statics.....	3
CivE 2210-Mechanics of Materials	3
Math 2222-Calculus III/Analytic Geometry	4
Physics 2135-Engineering Physics II	4
CerE 3230-Thermodynamics of Materials.....	3
MetE 2110-Metallurgy for Engineers.....	3
MetE 2120-Metals Microstructure Development.....	3
MetE 2125-Metals Structures and Properties Lab	1
MetE 3420,3425-Principles of Metals Processing w/ Lab	4
Econ 1100 or 1200-Micro or Macroeconomics.....	3
Elective/Humanities or Social Science.....	3
	34

THIRD YEAR

Cer Eng 3410-Characterization of Inorganic Solids.....	3
EngrMgt 1100-Principles of Engineer Management.....	1
EngrMgt 1210-Economic Analysis of Engr Projects	2
Math 3304-Elem Diff Equations or Statistics	3
MetE 3225-Extractive Met Lab	1
MetE 3220-Intro to Extractive Metallurgy	3
MetE 3320-Transport Phenomena in Metallurgy.....	3
MetE 3120-Fundamentals of Materials Behavior	3
MetE 3125-Metals Characterization Lab.....	1
MetE 4420-Metal Casting.....	3
Elective/Engineering or Science.....	3
Elective/MetE Core I.....	3
Elective/Communications.....	3
	32

FOURTH YEAR

MetE 4096-Materials Senior Design I.....	1
MetE 4097-Materials Senior Design II	2
MetE 4350-Process Metallurgy Applications.....	3
Elective/MetE Core II	3
Elective/MetE Core III.....	3
Elective/Humanities or Social Science	3
Elective/Statistics	3
Elective/Technical	3
Elective/Technical	3
Elective/Free.....	3
Elective/Free.....	2
	29