

Ceramic Engineering

Department of Materials Science and Engineering

Ceramic engineering is a specialty area of materials science and engineering that involves inorganic, nonmetallic materials. Ceramic engineers design materials that make it possible for other engineering disciplines to advance: glass fibers and optical devices for telecommunication networks; electronic ceramics that make electronic devices possible; high temperature materials that allow jet engines to operate at more efficient temperatures; biocompatible materials that replace diseased tissues, etc. Ceramic engineers use basic principles from chemistry and physics to understand how to design new materials at the atomic level, then to process these materials into useful forms that meet production needs.

Missouri S&T's ABET-accredited ceramic engineering program specializes in the product fields of glass, electronic materials, and high temperature materials, but stresses materials processing principles applicable to all products. With approximately 75 undergraduates and 30 graduate students, the Missouri S&T ceramic engineering program ranks among the leading programs in the United States.

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

Program Educational Objectives

Our graduates will be leaders in the science, technology, and management of ceramic engineering.

Our graduates will serve their profession and society.

Our graduates will continually enhance their professional skills and educational qualifications.

Student Organizations

Materials Advantage: Students participate and compete in national competitions at the MS&T annual meeting.

Keramos Honor Society: Missouri S&T had the nation's outstanding chapter for 11 of the last 14 years (1999-2013).

National Institute of Ceramic Engineers

Gaffers Guild: Artistic Glass-Blowing Club

Outstanding Teaching & Research

All instruction within the ceramic engineering program is by full-time Ph.D. faculty, and all faculty members teach. Student teaching evaluations consistently place the department well above the campus average.

Departmental faculty members annually supervise over \$6 million in funded research, providing research opportunities not only for graduate students but also a number of undergraduates.

Average Starting Salaries (2012-2013)

Bachelors:	\$58,770/year
Co-op:	\$2,936/month
Internship:	\$3,073/month

Co-op and Internship Availability

Ceramic engineering students work with large and small companies, traditional manufacturers of ceramic products and high-tech producers of ceramic components. In addition, ceramic engineering co-op students find research positions in government laboratories and with university materials organizations.

Scholarship Information

Freshman scholarships are automatically awarded based on high school transcripts and ACT/SAT scores. No separate application is necessary. Freshman students specifying a major in ceramic engineering are eligible for scholarships up to \$1,500. Sophomore, junior and senior scholarships are available from \$500-\$1,500.

Departmental Contact Information:

Department Chair:	Dr. Wayne Huebner
1.573.341.4711	223 McNutt Hall
http://mse.mst.edu	matlsci@mst.edu

Faculty

Professors:

Richard K. Brow, Ph.D., Penn State
Fatih Dogan, Ph.D., Technical Univ of Berlin, Germany
Gregory E. Hilmas, Ph.D., Michigan
Wayne Huebner, Ph.D., Missouri S&T
Mohamed N. Rahaman, Ph.D., Sheffield, England
William G. Fahrenheit, Ph.D., New Mexico

Associate and Teaching Associate Professors:

Mary R. Reidmeyer, Ph.D., Missouri S&T
Jeffrey D. Smith, Ph.D., Missouri S&T

Emeritus Professors:

Harlan Anderson (Curator's Emeritus), Ph.D., California-Berkeley
Delbert Day (Curator's Emeritus), Ph.D., Penn State
P. Darrell Ownby (Emeritus), Ph.D., Ohio State

Entry Level Jobs

Our graduates quickly advance to leadership positions in a wide range of fields, including automotive, aerospace, biomedical, electronics, energy, glass, nuclear, optical and infrastructure. Our graduates find jobs in large companies and small, located all around the United States. Many also choose to attend graduate schools across the country after completing their Bachelor's degree.

Facilities and Technology

Modern equipment and laboratories support the research effort and are often used in undergraduate training and by undergraduates participating in research programs. A variety of opportunities exist for multi-disciplinary research programs through collaborations with other departments (Biological Sciences, Electrical Engineering, Physics, Chemistry) or through campus research centers (Graduate Center for Materials Research, Center for Bone & Tissue Repair and Regeneration).

Notes

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

Additional Offerings & Minors

Related degree programs at Missouri S&T, in addition to the B.S. in ceramic engineering:

- Bachelor of Science, Metallurgical Engineering

Bachelor of Science

Ceramic Engineering.....128 credit hours

Entering freshmen desiring to study ceramic engineering will be admitted to the Freshman Engineering Program. If desired, a freshman can designate a Ceramic 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	5
English 1120-Exposition and Argumentation	3
FE 1100-Careers in Engineering	1
ME 1720-Intro to Design Theory	3
Math 1214-Calculus for Engineers I	4
Math 1215-Calculus for Engineers II	4
Met 1210-Chemistry of Materials.....	3
Physics 1135-Engineering Physics I	4
Elective/Humanities or Social Science	3
Elective/Humanities or Social Science	3
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SECOND YEAR

Cr Eng 3230-Thermodynamics of Materials	3
Cr Eng 2110-Atomic Crystal Structure	3
Cr Eng 2120-Intro to Glass Sci & Tech.....	3
Cr Eng 2210-Cer in the Modern World	2
Cr Eng 2315-Cer Materials Lab I.....	2
Cr Eng 2325-Cer Materials Lab II.....	2
Civ 2200-Statics.....	3
Math 3304-Elementary Differential Equations	3
Math 2222-Calculus III/Analytic Geometry	4
Physics 2135-Engineering Physics II	4
Elective/Humanities or Social Science	3
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THIRD YEAR

Cr Eng 3210-Thermal Proc in Ceramics.....	3
Cr Eng 3315-Cer Proc Lab I.....	2
Cr Eng 3325-Cer Proc Lab II.....	2
Cr Eng 3220-Phase Equilibria	3
Cr Eng 3410-Materials Characterization.....	3
Civ 2210-Mechanics of Materials	3
Physics 2305-Intro to Modern Physics	3
Elective/Humanities or Social Science	3
Elective/Humanities or Social Science	3
Elective/Technical	3
Elective/Advanced Chemistry.....	3
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FOURTH YEAR

Cr Eng 4096-Materials Senior Design I	1
Cr Eng 4097-Materials Senior Design II	2
Cr Eng 4240-Electrical Properties of Ceramics w/lab	4
Cr Eng 4220-Mechanical Properties of Ceramics w/lab	4
Cr Eng 4310-Ceramics Processing	3
Cr Eng 4250-Thermal Properties of Ceramics.....	3
EMgt 1100-Principles of Engr Management	1
EMgt 1210-Economic Analysis or Engr Projects	2
Elective/Technical	3
Elective/Technical	3
Elective/Statistics	3
Elective/Humanities or Social Science	2
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