The ceramic engineering program in the department of materials science and engineering offers comprehensive graduate education in a number of areas including structural ceramics, electronic materials, high temperature materials, and glass. Further information on these opportunities and facilities available to carry out research in ceramic engineering may be found under materials science and engineering.

Degree Requirements
M.S. and Ph.D. degrees are offered in ceramic engineering. The total number of hours required for the M.S. in ceramic engineering is 30. A minimum of 6 hours of 6000-level lectures and a minimum of 11 hours of graduate research on the Missouri S&T campus are required. A maximum of 6 hours of 4000-level lecture credit may be accepted.

The minimum number of hours (beyond the bachelor’s degree) required for the Ph.D. in ceramic engineering is 72. At least 12 hours of course work outside of ceramic engineering is recommended, a minimum of 24 hours will be dissertation research, and a minimum of 24 hours must be course work. Students will also be required to take and pass qualifying and comprehensive exams in accordance with Missouri S&T rules.

Richard K Brow, Curators Professor
PHD Pennsylvania State University
Curators’ Professor of Ceramic Engineering, and Senior Investigator, Graduate Center for Materials Research.

Fatih Dogan, Professor
PHD Technical University of Berlin
Curators Professor of Ceramic Engineering, and Senior Investigator, Graduate Center for Materials Research.

William G Fahrenholtz, Curators Professor
PHD University of New Mexico
Senior Investigator, Graduate Center for Materials Research.

Gregory E Hilmas, Curators Professor
PHD University of Michigan-Ann Arbor
Senior Investigator, Graduate Center for Materials Research.

Wayne Huebner, Professor
PHD University of Missouri-Rolla
Department Chair of Materials Science and Engineering.

Mohamed N Rahaman, Professor
PHD University of Sheffield (UK)

Mary R Reidmeyer, Associate Teaching Professor
PHD University of Missouri-Rolla
Outreach Coordinator.

Jeffrey D Smith, Associate Professor
PHD University of Missouri-Rolla

Jeremy Lee Watts, Research Assistant Professor
PHD Missouri S&T

CER ENG 5000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

CER ENG 5001 Special Topics (LEC 0.0-6.0)
This course is designed to give the department an opportunity to test a new course. Variable title.
CER ENG 5810 Principles Of Engineering Materials (LEC 3.0)
Examination of engineering materials with emphasis on selection and application of materials in industry. Particular attention is given to properties and applications of materials in extreme temperature and chemical environments. A discipline specific design project is required. (Not a technical elective for undergraduate metallurgy or ceramic majors) (Co-listed with Aero Eng 3877, Chem Eng 5300, Physics 4523, Met Eng 5810).

CER ENG 6000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

CER ENG 6001 Special Topics (IND 0.0-6.0)
This course is designed to give the department an opportunity to test a new course. Variable title.

CER ENG 6040 Oral Examination (IND 0.0)
After completion of all other program requirements, oral examinations for on-campus M.S./Ph.D. students may be processed during intersession. Off-campus M.S. students must be enrolled in oral examination and must have paid an oral examination fee at the time of the defense/comprehensive examination (oral/written). All other students must enroll for credit commensurate with uses made of facilities and/or faculties. In no case shall this be for less than three (3) semester hours for resident students.

CER ENG 6050 Continuous Registration (IND 1.0)
Doctoral candidates who have completed all requirements for the degree except the dissertation and are away from the campus must continue to enroll for at least one hour of credit each registration period until the degree is completed. Failure to do so may invalidate the candidacy. Billing will be automatic as will registration upon payment.

CER ENG 6085 Internship (IND 0.0-15)
Students working toward a doctor of engineering degree will select with the advice of their committees, appropriate problems for preparation of a dissertation. The problem selected and internship plan must conform to the purpose of providing a high level engineering experience consistent with the intent of the doctor of engineering degree.

CER ENG 6220 Optical Properties Of Materials (LEC 3.0)
The objective of this course is to give the student a fundamental understanding of the structure-optical property relationships exhibited by isotropic and anisotropic materials. Topics will include the wave/particle nature of light, how light interacts with materials, color, and applications such as lasers, fiber optic communication systems, electro-optics, and integrated optics. Prerequisites: Physics 2135 or 2111 and Math 2222.

CER ENG 6230 Composite Materials (LEC 3.0)
The objective of this course is to give the students an understanding of the processing, design, and mechanical behavior of composite materials. The course will treat both fiber reinforced and laminate-based composites with an emphasis on the macromechanical behavior of these composites with respect to their architecture. Prerequisite: Graduate Standing.

CER ENG 6240 Advanced Topics On The Vitreous State (LEC 3.0)
Modern aspects of the structure and dynamics of inorganic vitreous materials will be reviewed and applied towards understanding the macroscopic properties of glasses. Prerequisite: Graduate Standing.

CER ENG 6260 Advanced Electrical Properties of Ceramics (LEC 3.0 and LAB 1.0)
The application of ceramic chemistry and physics to the development and evaluation of electronic, dielectric, magnetic, and optical properties. Emphasis is placed on the relationships between properties and crystal structure, defects, grain boundary nature, and microstructure. Prerequisite: Grade of “C” or better in Physics 2305.

CER ENG 6310 Sintering And Microstructure Development (LEC 3.0)
Theory and practice of densification, microstructure evolution, effect of processing and material factors, grain boundary migration, grain growth. Prerequisite: Graduate standing.

CER ENG 6410 Advanced Integrated Computational Materials Engineering (LEC 2.0 and LAB 1.0)
Students will learn of different computational tools for studying materials at different length scales. The bridging between different modeling scales will be discussed. This course has a computational laboratory to build models and run simulations. Students will complete a final project by integrating two length-scale models. Prerequisite: A grade of B or better grade in Math 3304.