

MATERIALS SCIENCE (MATS)

Courses

MATS 5185. Nano-analysis of Materials. 1 Credit.

Explores the theory and practical operation of advanced techniques to analyze the structure, composition, and surfaces of micro and nano-scale materials. Students will be trained as users of a Field Emission Scanning Electron Microscope (FESEM) including x-ray elemental analysis. Credit not awarded for both PHYS 3175 and PHYS 5185. Prerequisite: Graduate student in Physics, Materials Science, or related program, or Instructor permission. Cross-listed with: PHYS 5185.

MATS 5610. Gr Chemical Thermodynamics. 3 Credits.

Calculus-based exploration of the fundamental principles of thermodynamics (gases, equilibrium, free energy, laws of thermodynamics, statistical thermodynamics, phase transitions, mixtures, chemical reactions, solids), from an interdisciplinary perspective. This topic is a cornerstone of many scientific and engineering disciplines. Appropriate for students in Chemistry and other STEM fields. Prerequisites: Graduate student or Instructor permission; content knowledge of general chemistry, calculus, and introductory physics (mechanics) assumed. Cross-listed with: CHEM 5610.

MATS 5625. Structure&Bonding of Materials. 3 Credits.

Study of atomic and molecular bonding, the structure of materials, and their associated properties. Explores how structures and bonding types influence the electrical, thermal, mechanical, and optical properties of materials. Covers topics such as primary and secondary bonding mechanisms, crystallography, diffraction techniques, and the properties of metals, ceramics, polymers, and biological materials. Prerequisites: Graduate student in Physics, Materials Science, or related program, or Instructor permission. Cross-listed with: PHYS 5625.

MATS 6391. Master's Thesis Research. 1-18 Credits.

Research for the Master's Thesis.

MATS 6990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

MATS 6991. Internship. 1-18 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

MATS 6995. Graduate Independent Research. 1-18 Credits.

Graduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

MATS 7491. Doctoral Dissertation Research. 1-18 Credits.

Research for the Doctoral Dissertation.

MATS 7990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

MATS 7991. Internship. 1-18 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

MATS 7995. Graduate Independent Research. 1-18 Credits.

Graduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.