Material Science (MTSC)

Advanced Undergraduate and Graduate-level Courses

MTSC 615. Structure of Solids. 3 Credits.
Crystallography, reciprocal lattices, Bloch waves, band structure, electronic wave functions, phonons, thermal expansion. Superlattice structures, including liquid crystals. Overview of properties of ceramic, amorphous, polymeric, and composite materials.
Grading status: Letter grade.

APPL 472. Chemistry and Physics of Electronic Materials Processing. 3 Credits.
Permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronic devices. Crystal growth, thin film deposition and etching, and microlithography.
Requisites: Prerequisite, CHEM 482 or PHYS 117 or 119.
Grading status: Letter grade
Same as: PHYS 472, CHEM 472.

APPL 492L. Materials Laboratory II. 2 Credits.
Continuation of PHYS 491L with emphasis on low- and high-temperature behavior, the physical and chemical behavior of lattice imperfections and amorphous materials, and the nature of radiation damage.
Requisites: Prerequisite, APPL 470 and PHYS 351.
Grading status: Letter grade
Same as: PHYS 491L.

APPL 473. Chemistry and Physics of Surfaces. 3 Credits.
The structural and energetic nature of surface states and sites, experimental surface measurements, reactions on surfaces including bonding to surfaces and adsorption, interfaces.
Requisites: Prerequisite, CHEM 470.
Grading status: Letter grade
Same as: CHEM 473.

APPL 490. Special Topics. 3 Credits.
Topics vary from semester to semester.
Repeat rules: May be repeated for credit; may be repeated in the same term for different topics; 12 total credits. 4 total completions.
Grading status: Letter grade.

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APPL 470. Fundamentals of Materials Science. 3 Credits.
Prerequisite, CHEM 482; or Crystal geometry, diffusion in solids, mechanical properties of solids, electrical conduction in solids, thermal properties of materials, phase equilibria.
Requisites: prerequisite, PHYS 128 and pre- or corequisite, PHYS 441.
Grading status: Letter grade
Same as: CHEM 470.

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