

MECE 6363: Physical Metallurgy

TERM:

Usually offered in the Fall Semester.

DESCRIPTION:

This course brings an overview of the structure and mechanical properties of solids. Provide graduate students a physical basis that links the micro-structures of metals to their mechanical behaviors. Topics include atomic structures of solids, diffraction mechanism and techniques, electron band structure of solids, defects and failure mechanism, diffusion and strengthening mechanism.

TOPICS COVERED:

➤ This course will cover the microstructure, transformation and properties of metallic materials using solid state physics and chemical thermodynamics. The approach is largely theoretical but all aspects of physical metallurgy and behavior of metals and alloys are covered. Some of the topics introduced during the course are:

- Structure of crystalline materials
- Analytical methods-diffraction
- Crystal bonding
- Dislocations
- Vacancies
- Annealing
- Phase Diagram
- Diffusion

COURSE GRADING:

The course grade will be based on quizzes and final exam.