

WMT - WELDING AND METALLURGICAL ENGINEERING TECHNOLOGY

WMT 3200 Thermodynamics of Welding and Metallurgy Cr. 4

The principles of thermodynamics and their application to metallurgical engineering processes. Topics covered include first and second laws of thermodynamics, reaction equilibria, free energies and phase behavior, and electrochemistry. Relationships between thermodynamic quantities with respect to metallurgical processing will be discussed in depth.

Offered Yearly.

Prerequisites: ET 2200 with a minimum grade of C-

WMT 4300 Welding Design Cr. 3

Offers a practical understanding and application of the design process for projects in welding engineering. The engineering aspects of the production of welded structures from the perspective of program development, concept, design and metallurgy will be taught. Students will gain further understanding of welding theory as it applies to design.

Offered Yearly.

Prerequisites: ME 4453 with a minimum grade of C-

WMT 4400 Engineering Alloys Cr. 3

A firm and thorough knowledge of engineering alloys is critical in developing an optimal design for a given application while minimizing the risk of material failure. This course examines the interrelationships between processing, structure, properties, and performance of various engineering metals such as ferrous and non-ferrous metals. The emphasis is upon developing the ability both to select appropriate materials to meet engineering design criteria and to understand the effects of thermal treatments, hot and cold work, imperfections, and chemical environments upon material properties and performance. A design project on material properties, selection, or application is also required. Offered Yearly.

Prerequisites: ET 2200 with a minimum grade of C-

WMT 4500 Failure Fracture Analysis Cr. 3

The scope of this course is to understand various types of failure modes in metals and alloys, contributing factors to failures and analytical and detection methods employed to identify and resolve failure issues. The discussion of the failures of structural members will include design considerations, material selection and mechanical and chemical loading.

Offered Yearly.

Prerequisites: ME 3452 with a minimum grade of C- and ME 4451 with a minimum grade of C-

WMT 5800 Welding Automation and Robotics Cr. 3

The scope of this course is to understand the concepts and technology associated with the operation of automatic and robotic welding systems.

This course will incorporate automation and robotic technology with welding metallurgy. Students will learn to develop and edit programs to complete simple and complex welds and learn the effects of welding variables and options on weldment structural integrity as they are applied to automated and robotic weld systems. Offered Yearly.

Prerequisites: ME 4435 with a minimum grade of C-