

Fluid and Thermal Sciences

The thermal sciences area involves the study of energy conversion and transmission, power generation, the flow of liquids and gases, and the transfer of thermal energy (heat) by means of conduction, convection and radiation. The flow of fluids and the transmission of heat are involved in virtually all energy conversion devices and systems. One may think of the jet engine as a mechanical device and yet its purpose is to control the flow of air and fuel in such a way that a thrust is developed and an airplane can be propelled forward. The processes involved are a superb example of thermal science processes being controlled by a mechanical device. It is the understanding of these processes that allows one to develop the mechanical device that produces them.

Undergraduates in Mechanical Engineering are introduced to the areas of thermal and fluid sciences through required courses: ME 503, Thermodynamics, ME 603, Heat Transfer, ME 608, Fluid Dynamics, and ME 705, Thermal Systems Analysis and Design.

Undergraduate in Ocean Engineering are introduced to the areas of thermal and fluids sciences through required courses: ME 503, Thermodynamics and ME 608, Fluid Dynamics.

In the study of Mechanical Engineering the thermal sciences encompass a sequence of courses in three separate areas. The sequence starts with ME 503, Thermodynamics, a sophomore spring course. This is followed by ME 608, Fluid Mechanics in the fall of the junior year and then ME 603, Heat Transfer in the spring of the junior year. A fourth course which integrates fundamental principles from each of these courses into the design process is ME 705, Thermal System Analysis and Design offered during the first semester of the senior year.

Mechanical Engineering students with career interests in the thermal sciences are encouraged to take elective courses such as: ME 706, Renewable Energy, ME 707, Analytical Fluid Mechanics; ME 709, Computational Fluid Mechanics; and ME 712, Waves in Fluids.