Physics 311

INTRODUCTION TO FLUID MECHANICS

General Descriotion - 3 Credits

This course covers the basic principles of fluid mechanics at an introductory but detailed level. Topics include statics, forces on plane and curve surfaces, kinematics of fluid motion, integral and differential representation of conservation of mass, the first Law of Thermodynamics, Bernoulli's equation, dimensional analysis, and elementary viscous flow. Frictional losses, simple pipeline analysis and steady channel flow are covered. Understanding of the physical phenomena is stressed and vector notation is used whenever suitable.

The course will provide the foundations for courses that students will encounter in physics, earth sciences and environmental pursuing careers in many branches of applied physics and engineering (mechanical engineering, civil and environmental engineering, biomedical engineering, biophysics, atmospheric sciences, oceanography, earth and planetary sciences), such as hydrology, hydrogeology, aerodynamics, geophysical fluid dynamics, propulsion systems, chemical reactor design, biophysics and dynamics of chemical processes.

Spring 2016 Syllabus