

An Introduction to Fluid Dynamics

This course introduces students to the mathematical theory of fluids via the Navier-Stokes Equations. The equations can be used to successfully model almost any fluid on Earth, but our mathematical understanding of them remains limited. So much so, that a \$1-million prize exists for anyone that can help to further our understanding of problems involving vortex reconnection, turbulence and whether or not the equations are 'well-posed'. We will look at examples in inviscid flow theory which provide insight into physical phenomena such as flight, vortex motion, and water waves. We will also explore the basic fluid dynamics necessary to build mathematical models of the environment in which we live, focusing on problems such as climate change, pollution, or the spread of infectious aerosol droplets within our buildings.

A full course syllabus will be posted shortly.