Fluid Mechanics

Goal: To extend the physical knowledge in the field of fluid mechanics

Contents:

Introduction to Fluid Mechanics
Definition of a fluid-fluid as a continuum.
Velocity field, stress field, viscosity.
Description and classification of fluid motions.

Fluid Static's
Pressure
Hydrostatic force on submerged surfaces
Buoyancy and stability
Dimensionless number: Reynolds number, Froude-, Mach-, Strouhal-number

Basic equations
Conservation of mass
Newton’s Second Law
The angular momentum principle
The first and second law of thermodynamics

Motion of a fluid element
Incompressible inviscid flow
Momentum equation for frictionless flow
Euler equation
Bernoulli equation

Internal incompressible viscous flow
Fully developed laminar flow
Flow in pipes and ducts
Turbulent flow

Boundary layer theory

Turbo machinery
Compressible flow in pipes
Isotherm and adiabat
Laval jet

Flow measurement (short introduction)
External incompressible viscous flow
Flow in open channels
Introduction to compressible flow