

FLUID MECHANICS

(2 2 6 1 0)

Syllabus

Course staff: Dr. Victor Chernov. e-mail: chernov@braude.ac.il. Office: D1-397. Office phone: 04-9901709. Office hours will be published at class.

Credits: 4.

Weekly hours: Lecture 3 hours, tutorial 2 hours.

Textbook: Robert W. Fox, Alan T. McDonald, Philip J. Pritchard, Introduction to Fluid Mechanics, John Wiley & Sons, 7th Edition (2009) OR 8th Edition (2012)

Course goal and description: Fluid mechanics principles are implemented in various fields of mechanical engineering which use a working fluid. Fluid mechanics plays important role in the design of a wide range of vehicles (sea, land and air), turbines, compressors, pumps and more. Fluid interactions and mechanics also have to be taken into account in buildings (skyscrapers), bridges, pipelines and more.

In this class you will learn the basics of fluid mechanics and how to approach problems that involve fluid, both static and moving. Various analysis methods and scientific and engineering principles that allow comprehensive analysis of a fluid behaviour will be taught

Main course subjects:

1. Introduction to Fluid Mechanics
2. Hydrostatics
3. Introduction to Fluid Dynamics
4. Integral approach, Reynolds Transport Theorem for mass and momentum
5. Bernoulli equation
6. Differential approach, Navier-Stokes equations, Euler equations
7. Laminar internal flow
8. Turbulent flow in pipes
9. Boundary layers
10. External flow – drag.

Grade: 100% final exam. Bonus points might be obtained during the classes.