

Óbudai Egyetem	
Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar	
Mérnöki fizika- Engineering Physics BGRFM11NEC	ECTS: 4
Dr. Ruzinkó E.	
Designed to develop an understanding of the phenomena of our everyday life via the laws of physics. Includes topics in mechanics, flow- and thermodynamics and other physics subfields.	
Topics	
1.	Fluid properties: density and specific weight, viscosity, compressibility, surface tension, capillarity, vapor pressure.
2.	Conservation laws. Properties of an ideal gas. First law of thermodynamics. Thermodynamics quantities: enthalpy, ratio of specific heats. Isotropic, isochoric, isobar, and adiabatic processes.
3.	Fluid statics: a general equation to predict the pressure variation. Pressure in liquid at rest. Pressures in the atmosphere. Manometers.
4.	Buoyancy: buoyant force, Archimedes' principle, prove the law of buoyancy, hydrometer; stability, metacentric height.
5.	Pressure in liquid contained in a linearly accelerating container. Pressure in liquid contained in a rotating container.
6.	Fluids in motion: Lagrangian and Eulerian description of motion. Fluids in motion: pathline, streamline, streamtube, streakline, the acceleration of a fluid particle (substantial and material derivative).
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8.	Fluids in motion: angular velocity and vorticity. Fluids in motion: the deformation of a particle; rate-of-strain tensor.
9.	Classification of fluid flows: one-, two-, and three-dimensional flows. Viscous and inviscid flows. Laminar and turbulent flows, Reynolds number. Incompressible and compressible flows.
10.	Derive the Bernoulli equation (along a streamline). Total head, static pressure, total pressure.
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12.	Piezometer, Pitot probe, Pitot static probe
13.	Test
14.	Test
Literature: Pijush K. Kundu, Ira M. Cohen, David R. Dowling, <i>Fluig Mechanics</i> , 2012. Elsevier.	
Recommended literature: Merle C. Potter, David C. Wiggert, Bassem Ramadan, <i>Mechanics of Fluids</i> , 2012, Cengage Learning. John R. Howell, Richaed O. Buckius, <i>Fundamentals of Engineering Thermodynamics</i> , 1992, McGraw-Hill, Inc.	