

<b>Óbuda University</b> Bánki Donát Faculty of Mechanical and Safety Engineering		Insitute of Mechatronics and Vehicle Engineering			
<b>Subject title and code:</b> Full-time study		<i>Engineering Physics BBXFME1BNE</i> 1 ac. 1 semester year			<b>Credits:</b> 4
<b>The course is available at:</b>		mechatronical engineering			
<b>Supervised by:</b> Prof.Dr. Endre Ruzsinkó		<b>Instructors:</b> Prof.Dr. Endre Ruzsinkó			
<b>Prerequisite (neptun code):</b>					
<b>Weekly number of lessons</b>					
Lecture: 2	Group seminar:	Lab:	Consultation:		
<b>Way of assessment:</b> Exam		(Written and oral)			
<b>Online consultation (in case it's required):</b> ... (BBB link)					
<b>Educational goal:</b>	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.				
<b>Schedule</b>					
Education week	Topics				
1.	Fluid properties: density and specific weight, viscosity, compressibility. Units				
2.	Fluid properties: surface tension, capillarity, vapor pressure. Units				
3.	Conservation laws. Properties of an ideal gas. First law of thermodynamics. Thermodynamics quantities: enthalpy, ratio of specific heats. Entropy.				
4.	Isotropic, isochoric, isobar, and adiabatic processes.				
5.	Fluid statics: a general equation to predict the pressure variation. Pressure in liquid at rest. Pressures in the atmosphere. Manometers.				
6.	Buoyancy: buoyant force, Archimedes' principle, prove the law of buoyancy, hydrometer; stability, metacentric height.				
7.	Pressure in liquid contained in a linearly accelerating container. Pressure in liquid contained in a rotating container.				
8.	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).				
9.	Fluids in motion: angular velocity and vorticity. Fluids in motion: the deformation of a particle; rate-of-strain tensor.				
10.	Classification of fluid flows: one-, two-, and three-dimensional flows. Viscous and inviscid flows. Laminar and turbulent flows, Reynolds number. Incompressible and compressible flows.				
11.	The Bernoulli equation (along a streamline). Total head, static pressure, total pressure.				
12.	Piezometer, Pitot probe, Pitot static probe				
13.	Test				
14.	Re-Test				
<b>Mid-semester requirements</b>					
Test		Assignment to be submitted		Lab measurement	
amount	dates	amount	deadlines	amount	dates
2	13th and 14th weeks				
<i>According to the Study and Examination regulations of Óbuda University attendance of group seminars and lab exercises are mandatory.</i>					
Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:					
Test		Assignment to be submitted		Lab measurement	

maximum points available 20points	minimum score required to pass /test 10points	maximum points available ...points	minimum score required to pass / assignment ...points	maximum points available ...points	minimum score required to pass /lab ...points
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<b>Total number of points achievable in semester:</b> 20points				
<b>Grading thresholds</b>	<b>satisfactory</b> 50 % and above	<b>average</b> 60 % and above	<b>good</b> 70 % and above	<b>excellent</b> 80 % and above
Other evaluation criteria:				
<b>Receive a signature denied entry:</b>	Fail a test			
<b>Required references:</b>	Merle C. Potter, David C. Wiggert, Bassem Ramadan, <i>Mechanics of Fluids</i> , 2012, Cengage Learning.			
<b>Recommended references:</b>	John R. Howell, Richaed O. Buckius, <i>Fundamentals of Engineering Thermodynamics</i> , 1992, McGraw-Hill, Inc. Pijush K. Kundu, Ira M. Cohen, David R. Dowling, <i>Fluig Mechanics</i> , 2012. Elsevier.			
<b>Quality assurance methods of the subject:</b>	<b>Contemporary softwears application</b>			

Things, that are not included, can be found within the regulations of Óbuda University.