

## Assessment and subject description

<b>Óbuda University</b>		Institute of Microelectronics and Technology		
Kandó Kálmán Faculty of Electrical Engineering		KEXTT1ABNE		
Subject name and code: <b>Basics of natural science</b>		<b>Credits: 3</b>		
<b>Full-time, autumn semester</b>				
Course: <b>Electrical engineering</b>				
Responsible:	<i>Csikósné Dr. Pap Andrea Edit</i>	Teaching staff:	Horváth Márk	
Prerequisites:	none			
Contact hours per week:	Lecture: 0	Class discussion: 2	Lab hours: 0	Tutorial: 0
Assessment and evaluation:	<b>midterm test</b>			
<b>Subject description</b>				
<i>Aims:</i> The course aims to improve the scientific thinking and problem solving skills of students, concentrating on classical physical problems. The course helps to bring students to an equal level of required knowledge for later subjects.				
<i>Topics to be covered:</i>				
<ul style="list-style-type: none"> <li>- Classical mechanics</li> <li>- Thermodynamics, ideal gases</li> <li>- Oscillations, waves, optics</li> </ul>				
<b>Topics</b>			<b>Week</b>	<b>Lessons</b>
Information on the subject. Kinematics of point-like bodies - uniform straight motions. - vector components of velocities - complex motions (ballistic motion)			<b>1.</b>	<b>2</b>
Dynamics - Newton's laws - friction, gravity - work, energy, power, efficiency			<b>2.</b>	<b>2</b>
- conservation of energy, potential energy - movement in gravitational field, on slope - impulse, conservation of impulse, collisions			<b>3.</b>	<b>2</b>
Circular motion - uniform, uniformly accelerating - basics of orbital mechanics (circular orbit, Kepler's laws) Rotation of rigid bodies			<b>4.</b>	<b>2</b>
Statics - equilibrium of rigid bodies			<b>5.</b>	<b>2</b>
Oscillations and waves - simple harmonic oscillations - pendulums, springs - waves			<b>6.</b>	<b>2</b>
holiday			<b>7.</b>	<b>2</b>
Mechanics of gases and liquids - pressure, density and other basics concepts - law of Archimedes, floating - basics of hydraulics			<b>8.</b>	<b>2</b>

Basics of thermodynamics - ideal gases, state variables - universal gas law - work on ideal gases, heat, heat capacity, internal energy	<b>9.</b>	<b>2</b>
Basics of thermodynamics - laws of thermodynamics - thermal expansion - phase transitions	<b>10.</b>	<b>2</b>
Optics - geometrical (ray) optics - wave optics - telescopes and microscopes	<b>11.</b>	<b>2</b>
Reserved for possible holiday; can be used for practice	<b>12.</b>	<b>2</b>
<b>Test</b>	<b>13.</b>	<b>2</b>
Possibility of repeat test and practice	<b>14.</b>	<b>2</b>
<b>Assessment and evaluation</b>		
<ol style="list-style-type: none"> <li>1. Participation in the classes is mandatory.</li> <li>2. There are two tests in the semester (planned on 6. and 13. week). At least 51% has to be achieved on both tests to pass. Both tests have equal number of points. There is a possibility of repeat test on the last week.</li> <li>3. The final grade is made by adding the points from the two tests. The levels for grades are: <ul style="list-style-type: none"> <li>2 – 50%</li> <li>3 – 65%</li> <li>4 – 75%</li> <li>5 – 85%</li> </ul> </li> </ol>		
<b>Suggested material</b>		
Any secondary school physics textbook.		