

<b>Óbuda University</b>		Kandó Kálmán Faculty of Electrical Engineering			Institute of Microelectronics and Technology	
<b>Subject name and code: Basics of Natural Sciences, KMETT11ANC, Credits: 3</b>						
Full-time, spring semester						
Course: <b>Electrical engineering</b>						
Responsible:	Dr. Lendvay Marianna		Teaching staff:	Horváth Márk		
Prerequisites:	-					
Contact hours per week:	Lecture: 2	Class discussion: 0	Lab hours: 0	Tutorial: 0		
Assessment and evaluation:	Grade from tests during semester					
<b>Subject description</b>						
<i>Aims:</i> This subjects aims to refresh and organize basic mathematical and physical knowledge to help with further university studies and help create the engineering way of thinking.						
<i>Topics to be covered:</i> Algebra (powers, roots and logarithms, linear and quadratic equations). Trigonometry. Coordinate-geometry. Mechanics (kinematics, dynamics, gravity, oscillations). Thermodynamics. Electricity. Optics.						
<b>Topics:</b>				<b>Week</b>	<b>Lessons</b>	
Sets of numbers. Basic operations with algebraic expressions (operations, signs, parenthesis, fractions). Identities, converting to product and square, domain of algebraic expressions.				<b>1.</b>	<b>2</b>	
Powers, roots and logarithms. Scientific notation, SI prefixes.				<b>2.</b>	<b>2</b>	
Linear and quadratic equations and inequalities. Exponential equations.				<b>3.</b>	<b>2</b>	
Trigonometry.				<b>4.</b>	<b>2</b>	
Coordinate-geometry. Vectors. Geometry.				<b>5.</b>	<b>2</b>	
Test on mathematics				<b>6.</b>	<b>2</b>	
SI system of units. Point mass and other definitions. Newton's laws. Momentum, energy, power. Conservation laws. Collisions.				<b>7.</b>	<b>2</b>	
Laws of gravity and friction. Ballistic orbits.				<b>8.</b>	<b>2</b>	
Circular and oscillating motions. Celestial mechanics.				<b>9.</b>	<b>2</b>	
Thermodynamics. State variables of ideal gases. Ideal gas law.				<b>10.</b>	<b>2</b>	
Other topics as needed. Practice.				<b>11.</b>	<b>2</b>	
Test on physics				<b>12.</b>	<b>2</b>	
Practice				<b>13.</b>	<b>2</b>	
Repeated test as needed.				<b>14.</b>	<b>2</b>	
<b>Assessment and evaluation</b>						
<i>Requirements:</i> <ol style="list-style-type: none"> <li>1. The attendance of lectures is mandatory.</li> <li>2. There are two tests during the semester. Both tests have to be accomplished to at least 60%.</li> <li>3. Failed tests can be repeated once during the semester and once during the exam period (later one for a fee) , according to the rules of the university.</li> </ol>						
<b>Suggested material</b>						
Electronic material found at <a href="http://mti.kvk.uni-obuda.hu/node/5">http://mti.kvk.uni-obuda.hu/node/5</a>						