

<b>Name:</b> Mathematics I. – Analysis I.	<b>Neptun-code:</b> NMXAN1EBNE	<b>Number of periods/week (lec/sem/lab)</b> regular: 3/3/0
<b>Credit points:</b> 6 <b>Requirement (assessment method):</b> midterm test signature and exam		<b>Prerequisite:</b> –
<b>Responsible:</b> László HANKA	<b>Position:</b> assistant professor	<b>Faculty and Institute name:</b> Bánki Donát Faculty of Mechanical and Safety Engineering, Institute of Mechatronics and Vehicle Engineering
<b>Course Description</b>		
<p>The course gives an overall review of elementary functions. The major materials to study include inverse trigonometric functions, hyperbolic functions and their inverses, functional limits and rate of change. The course also covers derivatives, derivatives of elementary functions, rules of differentiation, chain rule, implicit differentiation and Mean Value Theorems. The students will acquire the knowledge of extreme: necessary and satisfactory conditions for finding local minima and maxima, equation of a tangent line, necessary and satisfactory conditions for finding points of inflexion, curve sketching, antiderivative and standard antiderivatives. The subject also contains integration of functions, integration by part, integration by substitution, definite integral, Newton-Leibniz theorem, partial fractions, integrating trigonometrical functions, area, volumes, surfaces of solids of revolution. Other main guidelines are the following: centre of gravity, improper integrals. Complex numbers: addition, multiplication, n-th root in different forms: algebraic, trigonometrical and exponential forms, solving quadratic equations and the notion of Gaussian plane. The course also contains vector algebra, vector operations, inner product, cross product and mixed scalar product. The equation of a plane, and the system of equation of a straight line.</p>		
<b>Literature</b>		
<p><b>Recommended:</b></p> <ol style="list-style-type: none"> <li>1. Thomas' Calculus , 11th Edition, ISBN 0321185587, by Thomas, George B.; Weir, Maurice D.; and Giordano , Frank R., published by Pearson Education, Inc, Addison-Wesley</li> <li>2. Gilbert Strang: Calculus, Wellesley-Cambridge press</li> <li>3. Arthur Mattuck: Introduction to Analysis. Prentice Hall, New Jersey, 07458, 1999</li> </ol> <p><b>Additional:</b></p> <ol style="list-style-type: none"> <li>4. Zorich: Mathematical analysis I., ISBN 3-540-40386-8 Springer-Verlag Berlin Heidelberg New York</li> <li>5. Demidovich: Problems in mathematical analysis, Mir publishers, Moscow</li> <li>6. J. Stewart: Calculus, Brooks/Cole, USA, ISBN-13: 978-0-8400-5818-8, 2012</li> <li>7. Kuttler: Elementray linear algebra, Saylor, 2012</li> <li>8. Strang: Linear algebra and its applications, Brooks/Cole,USA, 1998</li> </ol>		