

Course Name	Calculus I		
Semester, Year	First Semester, 2019	Number of Credits	2 credits
Course level	1000	Course Number	027015
Instructor(s) (Institution)	Roumyana Yordanova 大学院理学研究院		
Course Objectives	<p>Calculus is a subject giving important foundation to natural science and technology. It is also important as the basis of data science applied to social science, medical science and so on.</p> <p>Basic knowledge on sequences and functions of one variable are summarized together with new notions and theorems. Differentiation of functions of several variables and its applications are also explained.</p>		
Course Goals	<p>The skills to be achieved throughout this course are the following:</p> <ul style="list-style-type: none"> <li>- to understand sequences and functions based on intuitive definition of limit;</li> <li>- to master differentiation of functions in one variable and several variables;</li> <li>- to compute approximate values, limits, extremum.</li> </ul>		
Course Schedule	<ol style="list-style-type: none"> <li>1. Sequences: definition of sequence, limit of a sequence</li> <li>2. Functions: Functions, graph of a function, types of functions, transcendental functions, continuity and intermediate value theorems, inverse functions, limits of functions</li> <li>3. Differentiation (one variable): Definition, tangent line, the differentiation of composite and inverse functions.</li> <li>4. Differentiation (one variable) : Mean value theorem, l'Hopital's rule, Taylor's theorem</li> <li>5. Differentiation (two variables): Point sets, continuity, limits of functions</li> <li>6. Differentiation (two variables): Functions of two or more variables, partial derivative, differentials, Taylor's theorem, chain rule of differentiation</li> <li>7. Differentiation (two variables): Implicit function, Jacobian, partial derivatives using Jacobian, implicit function theorem</li> <li>8. Differentiation (two variables): Graphs, min/max values, Hesse matrix</li> </ol>		
Homework	Study at home at least four hours per week -- Check basic notions you learn in the course, and try to solve exercises assigned by the teacher.		
Grading System	<p>Students are graded accordingly to whether or not</p> <ol style="list-style-type: none"> <li>1. he/she masters basic knowledge (definitions, theorems etc);</li> <li>2. he/she can treat typical example appropriately;</li> <li>3. he/she can construct mathematical argument correctly;</li> <li>4. he/she develops a unified understanding of the basic knowledge;</li> <li>5. he/she is able to apply the knowledge achieved during the course to given problems.</li> </ol>		
Textbooks / Reading List			
Websites			
Website of Laboratory			
Additional Information	The epsilon-delta definition of limits shall not be explained in detail. Students are recommended to take the course "Linear Algebra I".		