Course Curriculum Model (Syllabus)		
Faculty:	Faculty of Geosciences	
Department:	Materials-Metallurgy	
Level:	Bachelor	
Code of the course:	1	
Course:	Mathematics II	
Course Status:	Compulsive	
Semester:	II	Summer
Number of hours per week:		
ECTS:	7	
Time / location:	Tuesday	
Year of studies:		
Lecturer:	Ma.Arbëri Krasniqi, Phd Candidate	
Assistent:	Ma.Blerina Hasani	
Contact details:	Lecturer	Assistant
Email:	arberi.krasniqi@umib.net	Blerina.hasani@umib.net
Telefon:		

Content	Functions of single variable, limit and continuity. Differentiation of functions. Derivative as slope of tangent to a curve and as rate of change, application to tangent and normal, linearization, maxima/minima and point of inflexion, Taylor and Maclaurin expansions and their convergence. Integral as anti-derivative, indefinite integration of simple functions. Methods of integration: integration by substitution, by parts, and by partial fractions, definite integral as limit of a sum, application to area, arc length, volume and surface of revolution. Function of several real variables. Differential equations. First-order and second-order differential equations
Purpose	The objective of this course is to introduce the fundamental ideas of the differential and integral calculus of functions of one variable

<table>
<tr><td>Accessibility</td><td colspan="2">Upon successful completion of the course, students will be able to:
•Use both the limit definition and rules of differentiation to differentiate functions.
•Sketch the graph of a function using asymptotes, critical points, the derivative test for increasing/decreasing functions, and concavity.
•Apply differentiation to solve applied max/min problems.
•Apply differentiation to solve related rates problems.
•Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
•Apply integration to compute arc lengths, volumes of revolution and surface areas of revolution.
•Evaluate integrals using advanced techniques of integration, such as inverse substitution, partial fractions, and integration by parts.
•Use L'Hospital's rule to evaluate certain indefinite forms.
•Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
•Determine the convergence/divergence of an infinite series and find the Taylor series expansion of a function near a point.
•Sketch a slope field of a differential equation and find a particular solution
•Use an exponential function to model growth and decay
•Use separation of variables to solve a differential equation</td></tr>
<tr><td rowspan="14">Program</td><td>weeks</td><td>Lecture</td></tr>
<tr><td>First week:</td><td>Functions of single variable</td></tr>
<tr><td>Second week:</td><td>Elementary functions and their graphs</td></tr>
<tr><td>Third week:</td><td>Sequences. Limits of numerical sequences</td></tr>
<tr><td>Fourth week:</td><td>Limits of functions</td></tr>
<tr><td>Fifth week:</td><td>Continuity of functions of one variable.</td></tr>
<tr><td>Sixth week:</td><td>Derivatives of functions</td></tr>
<tr><td>Seventh week:</td><td>Basic theorems of differential calculus</td></tr>
<tr><td>Eighth week:</td><td>I colloquium.</td></tr>
<tr><td>Ninth week:</td><td>Concavity, Asymptotes, Curve sketching</td></tr>
<tr><td>Tenth week:</td><td>Sketch the graph of a function using derivations</td></tr>
<tr><td>Eleventh week:</td><td>Indefinite Integrals</td></tr>
<tr><td>Twelfth week:</td><td>Integration of Some Rational, Irrational and trigonometric functions</td></tr>
<tr><td>Thirteenth week:</td><td>Definite integrals. Compute arc lengths, volumes of revolution and surface areas of revolution.</td></tr>
</table>

	Fourteenth week:	Differential equations
	Fifteenth week :	II colloquium.
Literature	**Principal literature:** Hamiti, E.(2008). Matematika II, Shtëpia Botuese Libri Shkollor, Prishtinë. Shaska, T. (2017), Kalkulusi, Albanian Institute of Mathematics https://our.oakland.edu/bitstream/handle/10323/4607/Kalkulus-1.pdf?sequence=1 **Recommended Literature:** Stewart, J., Clegg, D. K., & Watson, S. (2020). Calculus: early transcendentals. Cengage Learning..	
Teaching methodology	Lecture, discussion, group work, exercises, homework, seminar papers	

Contribution to student workload (which should correspond to student learning outcomes - 1 ECTS credit = 25 hours)

Activity	Hours	Days/weeks	Total
Lectures	3	15	45
Exercise sessions (with TA)	2	15	30
Practical work	-	-	-
Office hours	-	-	-
Fieldwork			
Midterms, seminars	4	2	8
Homework	2	15	30
Self-study	3	15	45
Final exam preparation	9	1	9
Time spent in exams	3	1	3
Projects, presentations, etc	5	1	5
Total			175

Evaluation	**Teaching methodology:** (according to the Statute and Regulation for studies of UMIB)

Tests / Colloquia	40%
Seminary work	20%
Final exam	40%

Student gets the passing grade by collecting 50% at least.