D	Level		First cycle							
Program	Name of the p	rogram	1 All Study Programs		Contact hours (L+AE+LE) 4+4+0 e realization of the cours and series, real variable, continuity, ble and its application. functions of a real variable calculus when solving ers, rational, irrational, Lebesque, Bolzano- Geometric sequences. nvergence: Comparison t st. General series. Absolut oducts. unctions. rules of differentiation. se functions. Table of rmula. Higher order a. Rolle's Theorem. The f the remainder. uniqueness of Taylor's ns, convexity, inflexion					
	· · ·	0	COURSE							
Course title	ourse title Analysis I									
Course code	Semester	Course stati	15	ECTS	(Contact hours				
Gouise coue	bennester	Course state	•0	LOID		L + AE + LE				
PMAT 120	T	Mandatory	2011488	9	4	+4+0				
Lecturer	1	Mandatory	louise)						
Liciuici	After the aries	natic foundati	on of the set of rea	loumbo	the re	alization of the	2011#00			
	After the axio		ion of the set of fea	a numbe	ers, the re	calization of the G	course			
Course Coole	Mosto	11.	opt of the limit ral	o of com	10000 000	daariaa				
Course Goals	- Maste	ing the collect	limit makes of a real	le of sequ		u series,				
	- The co	oncept of the	infint value of a rea			a variable, conti	luity,			
	- Differ		s of a real function	of a real	variable	and its applicatio	on.			
	After completi	ng the course	, the student will:							
Learning	- Maste	r the criteria f	or convergence tes	ting,	c c		· , ,			
Outcomes	- Maste	r the techniqu	es of the differenti	al calculu	is of fund	ctions of a real v	ariable,			
	- Ihrou	igh examples,	feel the potential o	t differen	ntial calci	ulus when solvin	g			
	proble	ems.								
COURSE CONTENT										
- The real nu	umbers. The axi	om system of	real numbers. The	natural r	umbers,	rational, irration	ial,			
algebraic a	nd transcendent	al numbers. P	rıncıples: Cauchy-C	Cantor, B	orel-Leb	esque, Bolzano-				
Weierstras	s. Countability.	The uncounta	bility of the set of 1	eal num	bers.					
- Sequences.	The limit of a s	sequence. Lim	its and the arithme	tic opera	tions. Ge	eometric sequend	ces.			
Monotonia	c sequences. The	e number e. Ca	auchy sequences. S	ubsequer	nces.					
 Infinite ser 	ries. Sum of serie	es. Series of n	onnegative terms. (Criteria fo	or conver	rgence: Compari	son test,			
Root test, l	Ratio test, Raabe	e's test. Altern	ating series. Altern	ating seri	ies test. C	General series. A	bsolute			
convergen	ce. Uncondition	al and conditi	onal convergence.							
- Multiplicat	ion of series. Ca	uchy formula	. Summation by pa	rts. Infin	ite produ	icts.				
- Real functi	ons of one real	variable. The	limit of a function.	Continu	ous func	tions.				
- Monotonia	c functions. Eler	nentary functi	ons. Infinitesimal f	unctions	s.					
- Differentia	l calculus. Deriv	vative and diff	erential of a function	on. The r	nain rule	es of differentiation	on.			
Differentia	ition of a compo	osite function	(chain rule). Deriva	atives of	inverse f	unctions. Table of	of			
derivatives	of the basic eler	mentary funct	ions.							
- Invariance	of the different	ial form. High	er order derivative	s. Leibni	z's formu	ıla. Higher order				
differential	s. The basic the	orems of diffe	erential calculus. Fe	rmat's L	emma. R	olle's Theorem. '	The			
Theorems	of Lagrange and	l Cauchy.								
- L'Hospital	's rule. Taylor's f	formula. The	Cauchy and the Lag	grange fo	orm of th	e remainder.				
- Examples	of Maclaurin po	lynomials. Pea	ano form of the rer	nainder.	The unic	queness of Taylo	r's			
polynomia	l.	, ,				1 5				
- Examining	Examining the properties of functions: monotonicity, extrema of functions, convexity, inflexion									
points, asy	mptotes of func	tions.	, , , , , , , , , , , , , , , , , , ,		,	<u> </u>				
- Sketching	praphs of function	ons.								
- Selected ex	amples of the a	polication of o	differential calculus							
		L	TERATURE							
1. Dž Gušić	. Osnavi Tearin	e Nizova sa	Zhirkom Riješenih	Zadataka	. Prirod	lno-matematički	fakultet			
Univerzite	ta u Saraievu. Sa	raievo. 2021	1		., - 1110 u					
2 Dž Gušić	Teorija Redova I	(sa zhirkom rii	ešenih vadataka) Pr	irodno-n	natematič	ki fakultet Univ	erziteta 11			
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Lectures	OU Exerci	SES		I WORK	100		1.7.7			

GRADING			
Criterion	Maximum	Minimum	
Cinterion	points	points	
Midterm exams	100	55	
Final exam	100	55	
Total	100	55	