

Program	Level		First cycle				
	Name of the program		Mathematics and Informatics Education, Mathematics Education				
<b>COURSE</b>							
Course title	Analytic and Geometric Inequalities						
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)			
PMAT 387	IV	Elective course	4	2+2+0			
Lecturer							
Course Goals	Introduction to various (classical and modern) techniques of proving inequalities.						
Learning Outcomes	Comparative analysis of different methods, elementary and non-elementary ones, in proving inequalities.						
	Differentiation of concepts: finding extreme values and proving inequalities. Experienced manipulation with different algebraic expressions.						
	Better understanding of total order relation on the set of real numbers. Synthesis of some areas from the courses of Elementary mathematics and Analysis I.						
<b>COURSE CONTENT</b>							
<ul style="list-style-type: none"> <li>- Basic properties of the total order relation on the set of real numbers.</li> <li>- Formulation of a basic problem. Simple examples. Cyclic, symmetrical and homogeneous expressions.</li> <li>- Cauchy-Schwarz inequality, Aczel's inequality, Bellman's inequality.</li> <li>- Arithmetic-Geometric Mean Inequality.</li> <li>- Jensen's inequality.</li> <li>- Mixing-variable method.</li> <li>- Substitution method.</li> <li>- Forming the auxiliary inequality method.</li> <li>- Trigonometric inequalities.</li> <li>- Hadwiger-Finsler's inequality and Bager's inequality.</li> <li>- Application of derivatives in proving inequalities.</li> </ul>							
<b>LITERATURE</b>							
[1] Arslanagić, Zejnulah: Matematička čitanka 3, Grafičar promet d.o.o., Sarajevo, 2011. [2] Bešlagić: Jensenova nejednakost, Triangle, Vol.3, No. 4, 1999. [3] Bulajić-Manftino, Ortega, Delgado, Inequalities. A Mathematical Olympiad Approach, Birkhauser, 2009. [4] Cvetkovski: Inequalities, Springer, 2012. [5] Cirtoaje: Algebraic Inequalities, Gil Publ. House, 2006. [6] Hung: Secrets in Inequalities, Vol. 1, Gil Publ. House, 2007. [7] Hung: Secrets in Inequalities, Vol. 2, Gil Publ. House, 2008.							
<b>STUDENT WORKLOAD (hours in a semester)</b>							
Lectures	30	Tutorial	30	Individual work	40	T o t a l	100
<b>GRADING</b>				<b>REMARKS</b>			
Criterion	Maximum points	Minimum points					
Midterm exams (I+II)	40+40	23+22					
Homework assignments (I+II)	10+10	10					
Final exam	40	22					
T o t a l	100	55					