

Program		Type of studies (cycle)	Third cycle		
		Name of the program	SEE Doctoral Studies in Mathematical Science		
Course					
Course title		Algebraic Number Theory			
Course code	Semester	Course status	ECTS credits	Contact hours	
	III		10	30	
Teaching staff	Teacher	Prof. Dr. Ivan Chipchakov			
	Other staff	Doc. Dr. Amir Džambić			
Course goals	<p>Number theory has always exhibited a unique feature that some appealing and easily stated problems tend to resist the attempts for solution over very long periods of time. It has influenced and has been influenced by developments in many mathematical disciplines. Several breakthroughs that took place during last decades on one hand and unprecedented range of applications on the other, have significantly enlarged the interested mathematical community. In algebraic number theory methods from abstract algebra are used to solve problems from number theory. The main goal of the course is to provide insights into some areas of modern research in algebraic number theory.</p>				
Course content/topics					
<ul style="list-style-type: none"> • Number fields and algebraic integers • Unique factorization of ideals • Ideal class group • Dirichlet theorem on units • p-adic fields and local to global principle • Dedekind zeta and Hecke L-function • Elliptic curves over number fields • Zeta function of an elliptic curve • Birch and Swinnerton-Dyer conjecture • Shimura-Taniyama and Fermat's last theorem 					
LITERATURE		Grading			
<p>[1] H. P. F. Swinnerton-Dyer, <i>A brief guide to algebraic number theory</i>, London Mathematical Society, Student Texts, 50. Cambridge University Press, Cambridge, x+146 pp, 2001.</p> <p>[2] J. Neukirch, <i>Algebraic number theory</i>, Grundlehren der Mathematischen Wissenschaften, 322. Springer-Verlag, Berlin, 1999.</p> <p>[3] K. Ireland and M. Rosen, <i>A Classical Introduction to Modern Number Theory</i> (Corrected Second Printing), Graduate Text 84, Springer, 1993.</p> <p>[4] W. Narkiewicz, <i>Elementary and Analytic Theory of Algebraic Numbers</i>, third edition, Springer Monographs in Mathematics, Springer-Verlag, Berlin, 2004.</p>			Criterion	Points	Cut-off points
		1.	Written assignment	20	11
		2.	Project	40	22
		3.	Final exam	40	22
		Total			100