

Program		Type of studies (cycle)	Third cycle		
		Name of the program	SEE Doctoral Studies in Mathematical Science		
Course					
Course title		Algorithmic number theory			
Course code	Semester	Course status	ECTS credits	Contact hours	
	I		10	30	
Teaching staff	Teacher	Dr. Wolfgang A. Schmid			
	Other staff				
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. Algorithmic number theory or computational number theory is the study of algorithms for performing number theoretic computations. The main goal of the course is to provide insights into some areas of modern research in algorithmic number theory.</p>				
Course content/topics					
<ul style="list-style-type: none"> • Algorithms of elementary number theory • Algorithmic linear algebra for number theory • Main tasks of computational algebraic number theory • Applications in cryptography • Prime-testing and factorization • Computational problems of non-unique factorization theory and zero-sum theory • Recent developments 					
LITERATURE		Grading			
<p>[1] Eric Bach and Jeffrey Shallit: <i>Algorithmic Number Theory, Volume I: Efficient Algorithms</i>, MIT Press, August 1996.</p> <p>[2] Yan, Song Y.: <i>Number Theory for Computing</i>, 2nd ed., Springer-Verlag, 2002.</p> <p>[3] H. Cohen: <i>A Course in Computational Number Theory</i>, Graduate Texts in Mathematics 138, Springer-Verlag, Berlin, 1993.</p>			Criterion	Points	Cut-off points
		1.	Written assignment	20	11
		2.	Project	40	22
		3.	Final exam	40	22
		Total			100