

	<b>Course name:</b> MATH 615 – Algebraic Number Theory		<b>Department:</b> Mathematics				Semester 1
	Methods of Education						Credit (ECTS)
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total
100	20	0	50	50	20	240	8
Language	English						
Compulsory/Elective	Elective						
Prerequisites	None						
Course Contents	Week	Subjects					
	1	<ul style="list-style-type: none"> <li>▪ Algebraic numbers</li> <li>▪ Ring of integers of an algebraic number field</li> </ul>					
	2	<ul style="list-style-type: none"> <li>▪ Integral bases</li> <li>▪ Norms and traces</li> </ul>					
	3	<ul style="list-style-type: none"> <li>▪ The discriminant</li> <li>▪ Factorization into irreducibles</li> </ul>					
	4	<ul style="list-style-type: none"> <li>▪ Euclidean domains</li> <li>▪ Dedekind domains</li> </ul>					
	5	<ul style="list-style-type: none"> <li>▪ Prime factorization of ideals</li> </ul>					
	6	<ul style="list-style-type: none"> <li>▪ Principal ideal rings</li> </ul>					
	7	<ul style="list-style-type: none"> <li>▪ Lattices</li> </ul>					
	8	<ul style="list-style-type: none"> <li>▪ Minkowski's Theorem</li> </ul>					
	9	<ul style="list-style-type: none"> <li>▪ Geometric representation of algebraic numbers</li> </ul>					
	10	<ul style="list-style-type: none"> <li>▪ Class-group and class number</li> </ul>					
	11	<ul style="list-style-type: none"> <li>▪ Computational methods</li> </ul>					
	12	<ul style="list-style-type: none"> <li>▪ Fermat's Last Theorem</li> </ul>					
	13	<ul style="list-style-type: none"> <li>▪ Dirichlet's Units Theorem</li> </ul>					
	14	<ul style="list-style-type: none"> <li>▪ Quadratic residues</li> </ul>					
Course Objectives	<p>The purpose of this course is</p> <ul style="list-style-type: none"> <li>• to have students understand main structures in algebraic number theory and use them in related areas.</li> </ul>						
Learning Outcomes and Competences	<p>At the end of this course students will</p> <ul style="list-style-type: none"> <li>• learn basic concepts in algebraic number theory and use their suitable applications in related areas.</li> </ul>						
Textbook and /or References	<p><b>Textbook:</b> Algebraic Number Theory and Fermat's Last Theorem, I. Stewart, D. Tall, Third Edition.</p> <p><b>References:</b></p> <ol style="list-style-type: none"> <li>1) Algebraic Number Theory, Serge Lang.</li> <li>2) A Course in Computational algebraic Number Theory, Henri Cohen.</li> </ol>						
Assessment Criteria			If any, mark as (X)		Percentage (%)		
	Midterm Exams		X		40		
	Quizzes						
	Homework		X		10		
Projects							

	Term Paper		
	Laboratory work		
	Other		
	Final Exam	X	50
Instructors			