Program	Level	Second cycle
	Name of the program	Pure Mathematics, Applied Mathematics

COURSE					

Course title	**Algebraic Number Theory**				
Course code	Semester	Course status		ECTS	Contact hours (L+AE+LE)
PMAT 520	III	Mandatory / Elective course		8	3+2+0
Lecturer					
Course Goals	This course introduces students to the construction of number fields as well as primality, factorization and divisibility in number fields. Special attention is given to p-adic fields and their extensions.				
Learning Outcomes	Upon successful completion of the course students should: - understand algebra and number theory on a deeper level, - know how to construct number fields and their extensions, - have a generalized sense of number theoretic concepts such as primality, factorization, congruence, - be able to work with the basic concepts of algebraic number theory.				

COURSE CONTENT

- Euclidean domains. Integral domains of Gaussian and Eisenstein integers.
- Dedekind rings.
- Valuation and exponent.
- Finitely generated modules over Dedekind domains.
- Algebraic numbers and algebraic integers.
- Norm and discriminant.
- Integral bases.
- Valuations of algebraic number fields.
- Ideal classes.
- Units.
- Euclidean algorithm on algebraic number fields.
- The homomorphisms of injection and norm.
- Different and discriminant.
- Factorization of prime ideals in extensions.

LITERATURE

[1] W. Narkiewicz, Elementary and Analytic Theory of Algebraic Numbers, 2nd ed, Springer Verlag and PWN, 1990.
[2] J. Esmonde, M. R. Murty, Problems in Algebraic Number Theory, 2nd ed., Graduate Texts in Mathematics, Springer Verlag, 2005.
[3] J. Neukirch, Algebraic Number Theory, Springer Verlag, 1999.
[4] S. Lang, Algebraic Numbers, Addison-Wesley Publishing Company Inc., 1964.

STUDENT WORKLOAD (hours in a semester)							
Lectures	45	Exercises	30	Individual work	125	T o t a l	200

GRADING			REMARKS	
Criterion	Maximum points	Minimum points		
Midterm exams	40	22		
Zadaće	20	10		
Final exam	40	23		
T o t a l	100	55		