

Course title:	Number Theory
Institute/Division:	Institute of Mathematics, Faculty of Physics, Mathematics and Computer Science
Course code:	F2-NTh
Erasmus subject code:	11.1 Mathematics
Number of contact hours:	45 hours
Course duration:	1 semester
ECTS credits:	6
Course description:	

This course is an elementary introduction to number theory for undergraduate students in Mathematics, Computer Science, Physics or Engineering with no previous knowledge of the subject.

Topics covered include: common number sets, the principle of mathematical induction, minimum principle, primes, division algorithm, the Euclidean algorithm and continued fractions, greatest common divisors, the m-adic representations of integers, the binomial coefficient, the lexicographic order, examples of abelian groups, congruence's, the ring of congruence classes, Fundamental theorem of arithmetic, the p-adic value, the radical, Sieve of Eratosthenes, Bertrand's postulate, diophantine equations, the Euler Phi function, The Chinese remainder theorem, Wilson theorem, Euler's theorem and Fermat's Little theorem, pseudoprimes and Carmichael numbers, reduced residue system, primitive roots, the index with respect to primitive root, the discrete logarithm, power residues, quadratic reciprocity.

Literature:

- W. Narkiewicz, *Number Theory*, World Scientific, Singapore, 1983.
W. Sierpiński, *Elementary theory of numbers*, Warszawa-Amsterdam-New York-Oxford, 1987.
Z.I.Borevich, I.R.Shafarevich, *Number Theory*, Academic Press, 1966.
H.Davenport, *The Higher Arithmetic*, Cambridge University Press, 2008.
G. H. Hardy and E. M. Wright, *An Introduction to the Theory of Numbers*, Oxford University Press, 1979.

Course type:	lectures (30 hours), problem sessions (15 hours)
Assessment method:	two tests during the semester, final exam
Prerequisites:	at least one college level math course
Primary target group:	Majors in Computer Science, Mathematics, Physics or Engineering
Lecturer:	Maciej Zakarczemny, PhD
Contact person:	Maciej Zakarczemny, e-mail: mzakarczemny@pk.edu.pl
Deadline for application:	
Remarks:	