



Course title	Number Theory
Institute/Division	Faculty of Computer Science and Telecommunication/ Department of Mathematics
Course code	F-2.NT
Erasmus subject code	11.1 Mathematics
Number of contact hours**	45 lecture hours (45h)
Course duration	1 semester (Fall)
ECTS credits	6
Course description (max 100 words)	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. The topics covered include common number sets, the principle of mathematical induction, the minimum principle, primes, the 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, congruences, the ring of congruence classes, the Fundamental Theorem of Arithmetic, the p-adic value, the radical, the Sieve of Eratosthenes, Bertrand's postulate, Diophantine equations, the Euler Phi function, the Chinese Remainder Theorem, Wilson's Theorem, Euler's Theorem, and Fermat's Little Theorem, pseudoprimes, and Carmichael numbers, reduced residue systems, primitive roots, the index with respect to primitive root, the discrete logarithm, power residues, and 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/organization	<ul style="list-style-type: none"> • Lectures (30h), • Exercises (15h).
Assessment method	Two tests will be administered during the semester, followed by a final exam.
Prerequisites	The course requires the completion of at least one college-level math course.
Primary target group	Majors in Computer Science, Mathematics, Physics, or Engineering.
Contact person	Maciej Zakarczemny, e-mail: mzakarczemny@pk.edu.pl
Remarks	-

*please insert one of the following codes:

- 11.0 Mathematics, Informatics
- 11.1 Mathematics
- 11.2 Statistics
- 11.3 Informatics, Computer Science
- 11.4 Artificial Intelligence
- 11.5 Actuarial Science
- 11.9 Others Mathematics, Informatics

**1 lecture hour=45 minutes