

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Abstract algebra and general topology		Code 1010341531010344917
Field of study Mathematics	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 3
Elective path/specialty -	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: - Laboratory: - Project/seminars: -		No. of credits 6
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art the sciences		ECTS distribution (number and %) 6 100%
Responsible for subject / lecturer: Prof. dr hab. Ryszard Płuciennik email: ryszard.pluciennik@put.poznan.pl tel. 61 665 33 59 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge In domain of calculus, mathematical logic, set theory and linear algebra.
2	Skills	Using of calculus of logic sentences and quantifiers. Expressing in the language of the set theory. Familiarity with the notion of convergence and limit.
3	Social competencies	Understanding of limitation of own knowledge and motivation for further education.
Assumptions and objectives of the course: Mastery in abstract algebra to a degree which is necessary to study mathematics. Noticing of algebraic structure in mathematical objects such that permutations, isometries, subsets of real and complex numbers. Understanding of the relation of affine, metric and topological classification.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. master a basic knowledge of abstract algebra and understand connections of abstract algebra with other subjects of mathematics, in particular mathematical analysis and classical algebra. - [K_W07] 2. master fundamental algebraic structures and understand their importance to creation of examples and counterexamples enabling to prove or refute a given hypothesis. - [K_W05]		
Skills: 1. present in a clear manner in words and writing mathematical deduction, formulate theorems and definitions and use quantifiers and sentential calculus in proving theorems. - [K_U01 K_U02 K_U04] 2. create a new algebraic objects by construction of quotient spaces, simple sums, Cartesian products and other methods. - [K_U05] 3. create a new algebraic objects by construction of quotient spaces, simple sums, Cartesian products and other methods. - [K_U08]		
Social competencies: 1. He is able to formulate precisely questions which lead to go deeply his own understanding of given problem or finding of missing elements of deduction. - [K_K02] 2. He is able to study by oneself with a handbook and, if necessary, use English literature. - [K_K06]		
Assessment methods of study outcomes		

Lecture		
Valuation of knowledge and skills during oral and written exam.		
Course description		
Groups, subgroups and quotient groups. Homomorphism of groups. Normal subgroup. Cosets and Lagrange theorem. Group of transformations and permutation group. The structure of finitely generated abelian group. Isometry group and group of similarities. Rings and their homomorphisms. Ideals and quotient rings. Rings of polynomials. Fields. Extension of fields. Algebraic boundedness of fields.		
Basic bibliography:		
1. B. Gleichgewicht, Algebra, Oficyna wydawnicza GIS Wrocław 2002.		
2. J. Rutkowski, Algebra abstrakcyjna w zadaniach, PWN, Warszawa 2002.		
Additional bibliography:		
1. S. Lang, Algebra, Springer Verlag 2002		
Result of average student's workload		
Activity	Time (working hours)	
Student's workload		
Source of workload	hours	ECTS
Total workload	90	6
Contact hours	30	6
Practical activities	0	0