STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Topology		**1010342621010346314**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mathematics	**(brak)**	**1 / 2**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **30**	Classes: **15**	Laboratory: **-**	Project/seminars: **-**	**4**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
the sciences	**4 100%**
Mathematical sciences	**4 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Familiarity with basic notions of Topology, set theory, theory of groups, and n-dimensional spaces.
2	**Skills**	Ability to formulation of mathematical problems in the topological terms and possession of intuition in using of topological notions.
3	**Social competencies**	Ability to communicate by using topological notions. Ability to presentation and solving mathematical problems. Ability to generalization of some mathematical problems on the base of topology.

Assumptions and objectives of the course:

Knowing of basic notions concerning various types of topological spaces and sets included in them. Having knowledge from topology that can be useful in other fields of mathematics, in particular calculus and geometry.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. The student is able to define various types of topological spaces, sets included in them ind their fundamental properties. - [K_W03]

2. The student understand notions of continuous functions, homeomorphism, curves, homotopy, topological manofold, what anables him to use them in other subjects of mathematics. - [K_W05]

Skills:

1. The student is able to use the notions of topological space and its basic characteristics, in particular homeomorphism invariants. He is able to generate topological spaces basing on given topological spaces. He also can define topologies in some function spaces. - [K_U08]

2. The student is able to define continuity of function in topological spaces. He is able to use such notions as curve and homotopy and applies to define characteristics of topological manifolds. He also is able to apply topological properties of objects in other subjects of mathematics, for example calculus and geometry. i geometrii - [K_U08]

Social competencies:

1. The student is able to conclude properly in matters of topologu. - [K_K01, K_K02, K_K04]

Assessment methods of study outcomes

Lectures
Valuation of knowledge and skills during oral and written exam.

Practical Lessons
One large tests concerning an application of knowledge from the lectures in exercises.
Systematic control of theoretical knowledge in form of short quizes.
Valuation of student answers during lessons.
Valuation of activity during lessons.

Course description

Revised 2017

Applied methods of education: lectures and practical lessons.

Interactive lectures with problems and questions for students. The activity of students is taken into account in valuation of them. Discussion during lectures is expected. Connections with others mathematical subjects are indicated.

Practical lessons. Solving of exemplary exercises on a blackboard. Discussion of solutions with relative comments.

Topological spaces and generation of them. Inductive and projective topologies. Separable spaces. Lindelof theorem. Compact and connected sets. Cantor set and its properties. Compact spaces and their properties. Tychonoff's theorem. Bolzano-Weierstrass theorem. Commected spaces and their properties. Arcwise connected sets. Relationships between connectness and arcwise connectness. Homotopy. Brower Theorem.

Basic bibliography:

1. R. Engelking, Topologia ogólna, Wydawnictwo Naukowe PWN Warszawa 2012.
2. K. Jänich, Topologia, PWN Warszawa 1996.

Additional bibliography:

1. K. Kuratowski, Wstęp do teorii mnogości i topologii, Wydawnictwo Naukowe PWN Warszawa 2004

Result of average student's workload

Activity	Time (working hours)
1. .Taking part in lectures	30
2. .Taking part in practical lessons	15
3. Preparing for practical lessons	20
4. Prepating for tests	15
5. Preparing for the exam and taking part in it	20

Student’s workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	45	3
Practical activities	15	1