DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR DECLARING/CONDUCTING COURSE: PAWEŁ KRUPSKI
DEPARTMENT OF MATHEMATICS
SCIENTIFIC DISCIPLINE: MATHEMATICS

COURSE CARD

Course name in Polish: Topologia przestrzeni euklidesowych
Course name in English: Topology of Euclidean spaces
Course language: Polish or English
The course is intended for all PhD students: YES
SPECIALIST COURSE

Subject code: MAQ100278W

* delete as applicable

	Lecture			
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam			

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic metric topology
2. General topology

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COURSE OBJECTIVES

C1 Simplexes, polyhedra, simplicial approximations and some applications in topology.
C2 Homotopies and covering maps.
C3 Theorems on sphere separations.
C4 Invariance theorems.
C5 Fundamental group.

PROGRAM CONTENTS

Form of classes: Lectures and problem solving classes		Number of hours
	Affine notions. Simplexes, barycentric subdivisions	3
	Sperner's Lemma and Brouwer's Fixed Point Theorem	3
	Homotopies. Borsuk's Homotopy Extension Theorem	3
	Polyhedra. Simplicial Approximation Theorem	3
	Extension theorem for mappings into spheres. Borsuk's Sphere Separation Theorem	2
	Jordan-Brouwer Theorem. Theorem on interior point invariance and applications	2
	Covering maps and spaces. Homotopy and path lifting.	2
	Fundamental groups. Induced homomorphisms	2

	Fundamental groups of of products.	2
	Edge groups of polyhedral. Isomorphism with fundamental groups.	4
	Algorithms for edge group calculations. Applications.	4
	Total hours	30

TEACHING TOOLS USED
N1. Lectures N2. Problem solving N3. Student presentations

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome Gradings: F=student's activity, P=final grade	Code of learning outcome	Assessment of learning outcome
F_1	P8S_UK	Student's activity during semester
F_2	P8S_WG	Final exam
$P=1/2(F_1 + F_2)$		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] R. Engelking, K. Sieklucki, Wstęp do topologii. (Eng. edition: Topology. A Geometric approach)

[2] J. Mioduszewski, Wykłady z topologii. Topologia przestrzeni euklidesowych.

SECONDARY LITERATURE:

J. van Mill, The Infinite-Dimensional Topology of Function Spaces.

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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