Course code	
Type and description	Elective Course
ECTS credit	1
Course name	Integrals of vector functions
Course name in Polish	Całki funkcji wektorowych
Language of instruction	English
Course level	8 PRK
Course coordinator	Marek Balcerzak
Course instructors	Marek Balcerzak

Delivery methods and course duration

	Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester
Contact hours		0	0	15	0	0	15
E-learning	No	No	No	No	No	No	
Assessment criteria (weightage)	0,00					0,00	

Course objective

Course objective:

1. Acquiring knowledge about the Riemann integral for vector functions on [a,b]

2. Acquiring knowledge about weak and strong measurability of vector functions defined on a measure space.

3. Acquiring basic knowledge about the Bochner integral and the Pettis integrals for vector functions.

Learning outcomes

Having completed the course student can:

1. Describe definition of the Riemann integral for vector functions with examples - effects W4, U4, K1

2. Describe weak and strong measurability of vector functions - effects W4, K1

3. Use the Bochner integral and its properties - effects U4, K1

Assessment methods

W4 - oral exam

U4, K1 - project seminar presentation

W4, U4 - written project

The final grade

Exam - 50%

Presentation - 20%

Project evaluation - 30%

Prerequisites

Theory of the Riemann and the Lebesgue integrals for real functions

Course content with

LECTURE

delivery methods	1. Riemann integral for vector functions on [a,b], equivalent definitions and properties.
	2. The Lebesgue property of Banach spaces, examples.
	3. Weak and strong measurability of vector functions on a measure space. The Pettis theorem.
	4. Bochner integral and its properties. Information on Dunford and Pettis integrals.
	PROJECT
	1.Examples of integration in the Riemann sense for vector functions
	2.Selected properties of the Bochner integral.
Basic reference materials	1. R. A. Gordon, Riemann integration in Banach spaces, Rocky Mountain J. Math. 21 (1991), 923--949.
	2. J. Diestel, J. J. Uhl, Vector measures, AMS 1977.
Other reference materials	
Average student workload outside classroom	10 h
Comments	
Last update	11.05.2023