

Elements of the History and Philosophy of Mathematics - course description

General information	
Course name	Elements of the History and Philosophy of Mathematics
Course ID	11.1-WK-MATP-EHFM-W-S14_pNadGen0DBZX
Faculty	Faculty of Mathematics, Computer Science and Econometrics
Field of study	Mathematics
Education profile	academic
Level of studies	First-cycle studies leading to Bachelor's degree
Beginning semester	winter term 2020/2021

Course information	
Semester	6
ECTS credits to win	2
Course type	optional
Teaching language	polish
Author of syllabus	<ul style="list-style-type: none">prof. dr hab. Marian Nowak

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Credit with grade

Aim of the course

Students should be familiar with an outline of history of main fields of mathematics, in particular, with evolution of the most important concepts and ideas in mathematics . Moreover , students should know the main directions in modern philosophy of mathematics.

Prerequisites

Standard graduate courses in : logic and the set theory, geometry , mathematical analysis.

Scope

1. Outline of history of logic and the set theory. (2 hours)
2. Foundations of mathematics. Formalized theories. Hilbert's program . Models of mathematical theories. Godel's theorems and their philosophical implications. (2 hours)
3. The classical directions in the modern philosophy of mathematics. Platonism, formalism, intuitionism, constructivism. (2 hours)
4. The problem of the truth and existence in mathematics. The cultural basis of mathematics. (2 hours)
5. Different concepts of reconstruction of mathematics. Reconstruction of mathematics on the base of the set theory. Structuralism in mathematics: Bourbaki. Theory of categories (2 hours)
6. Elements of history of mathematics. Mathematics in the Ancient Orient.(2 hours) Mathematics in Greece.(2 hours) Arabic Mathematics (2 hours) Mathematics in XVI century.(2 hours) Mathematics in XVII century.(2 hours) Mathematics in XVIII century.(2 hours) Mathematics in XIX century.(2 hours)
7. Evolution of the most important mathematical concepts and ideas. Outline of history of geometry, algebra and mathematical analysis.(4 hours)
8. Outline of history of mathematics in Poland. The Lvov and the Warsaw mathematical schools.(2 hours).

Teaching methods

Traditional lecture , open to a discussion and expressing opinions by students.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student knows and can describe the classical directions of modern philosophy of mathematics.	<ul style="list-style-type: none">K_U07	<ul style="list-style-type: none">a discussionan essay	<ul style="list-style-type: none">Lecture
Student can characterize axiomatic-deductive structure of mathematical theories. He can describe the concept of a model of a mathematical theory.	<ul style="list-style-type: none">K_W03	<ul style="list-style-type: none">a discussionan essay	<ul style="list-style-type: none">Lecture
Student can characterize position and importance of Polish mathematics and explain the civilizing and cultural meaning of mathematics.	<ul style="list-style-type: none">K_W01	<ul style="list-style-type: none">a discussionan essay	<ul style="list-style-type: none">Lecture
Student is familiar with an evolution of basic mathematical concepts , in particular , the concepts of number and space. He/she is familiar with an outline of evolution of basic fields in mathematics: geometry, algebra and mathematical analysis.	<ul style="list-style-type: none">K_W07	<ul style="list-style-type: none">a discussionan essay	<ul style="list-style-type: none">Lecture
Student can work individually with a source literature on history and philosophy of mathematics.	<ul style="list-style-type: none">K_K06	<ul style="list-style-type: none">a discussionan essay	<ul style="list-style-type: none">Lecture

Assignment conditions

Students write an essay on a chosen subject in the history or philosophy of mathematics.

Recommended reading

1. D. Struik, A Concise History of Mathematics, Dover Publications ,Inc., New York,1948.
2. R. Murawski, Filozofia matematyki. Zarys dziejów, Warszawa 1995.
3. P. Davis, R. Hersh, Świat matematyki, PWN , Warszawa 1994.
4. James, Remarkable Mathematicians, Cambridge University Press 2002.

Further reading

1. M. Kordos, Wykłady z historii matematyki, Wyd. II, SCRIPT, Warszawa 2006.
2. M. Murawski, Współczesna filozofia matematyki, Wybór tekstów, Wydawnictwo Naukowe PWN , Warszawa 2002.

Notes

Modified by dr Alina Szelecka (last modification: 18-09-2020 13:45)

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