COURSE DESCRIPTION CARD - SYLLABUS

Course name
History of mathematics

Course

Field of study
Mathematics in technology

Year/Semester
4 / 7

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr Adam Marlewski

Responsible for the course/lecturer:

Prerequisites

The course participant knows higher mathematics to the extent taught in the first 6 semeters of mathematics studies

Course objective

Showing, in chronological terms, the development of mathematics and its importance in the development of civilization

Course-related learning outcomes

Knowledge

Orientation in the historical development of mathematical concepts and hypotheses, also knowledge of the silhouettes of the most outstanding mathematicians

Skills

Understanding the process of developing mathematical concepts and methods, also in combination with logic, philosophy, physics and engineering sciences

Social competences

The awareness that mathematics is an important element of general culture and an indispensable factor in the development of civilization, especially that of technology

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Each participant of the course will work out, in the form of doc and ppt files, a selected topic from the history of mathematics; this work will be evaluated (on a scale of 2-5) and then made available by the teacher to other course participants

Programme content

1. Notches, drawings and ornaments - the beginnings of numbers, arithmetic and geometry

2. Mathematics of ancient Mesopotamia, Egypt, India and China, as well as in America and Oceania

3. Greek period (Thales, Pythagoras, Zeno of Elea, Plato)

4. Hellenic period (Euclid, Archimedes, Menelaus, Diophantus, Apollonius of Perga)

5. Islamic mathematics (al-Charizmi, al-Karaji, al-Tussi)

6. Middle Ages (Fibonacci, Oresme, Regiomontanus)

7. 16th century (Dürer, Tartaglia, Cardano, L. Ferrari)

8. 17th century (Napier, Galileo, Descartes, P. de Fermat, B. Pascal, I. Newton, G. Leibniz)

9. 18th century (Jacob and Johann Bernoulli, Euler, Lambert, Lagrange, Laplace, Legendre)

10. 19th century (Fourier, Gauss, Cauchy, Łobaczewski, Abel, Bolyai, Jacobi, Hamilton, Galois, Boole, Weierstrass, Cayley, Riemann, Cantor, Klein, Poincaré, Peano, Hilbert)

11. 20th century (Whitehead, Minkowski, Russell, Hardy, Ramanujan, von Neumann, Gödel, Weil, Turing, Erdös, E. Lorenz, Grothendieck, Nash, Appel i Haken, Cohen, Conway, Matijasiewicz, Wiles, Perelman)

12. Fields medal (1936 and every 4 years since 1950), Wolf prize (started in 1978), Rolf Bevallina prize (started in 1982, since 2019: Abacus prize), Henri Poincaré prize (since 1997), Ostrowski prize (every 2 years since 1989), Abel prize (since 2003), Ramanujan prize (since 2005), Gauss prize (every 4 years since 2006), Chern medal (every 4 years since 2010), Leelavati prize (every 4 years since 2010)

Teaching methods

A lecture illustrated with slides, essays prepared by the audience (and commented on by the lecturer); in the case of distance learning: through the educational platform, website, direct telephone contact between the teacher and the student

Bibliography

Basic

D.J. Struik - Krótki zarys historii matematyki do końca XIX wieku, PWN 1963

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Additional

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С. Г. Гиндикин - Рассказы о физиках и математиках, Издательство МЦНМО 2006 (4 изд)

M. Szurek - Liczby w kulturze, Matematyka Stosowana 7, 2006, 52-78

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S. G. Krantz - An episodic history of mathematics: Mathematical culture through problem solving, Mathematical Association of America 2009

E. A. González-Velasco - Journey through mathematics. Creative episodes in its history, Springer 2011

M. Nauenberg - Barrow and Leibniz on the fundamental theorem of the calculus, arXiv:1111.6145, 2011, 1-27

I. Stewart - Em busca do infinito Uma história da matemática dos primeiros números à teoria do caos, Zahar 2014

J.-P. Friedelmeyer - Euler, ou l'art de chercher, découvrir, inventer, APMEP no.437, 2014, 867-879

R. Murawski - Filozofia matematyki. Zarys dziejów, Wyd.Naukowe UAM 2017

R.Wagner - Making and breaking mathematical sense: Histories and philosophies of mathematical practice, Princeton University Press 2017

E. Robertson, J. O'Connor - MacTutor history of mathematics, University of St Andrews, Scotland, https://mathshistory.st-andrews.ac.uk/ (visited 2020-08-29)

W. Smith et al. - The story of mathematics, Luke Mastin, https://www.storyofmathematics.com/ (visited 2020-08-29)

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation of an essay and presentation) [1]	45	2,0

[1] delete or add other activities as appropriate