SF2719 The History of Mathematics 6.0 credits

Matematikens historia

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for SF2719 valid from Autumn 2018

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mathematics

Specific prerequisites

SF1624, SF1625, SF1626 and SF1901, or equivalent courses.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The aim of the course is to give students the knowledge and skills to analyze and contextualize historical mathematical texts with respect to the development of mathematics through history, the mutual influences between mathematics and society, and to draw conclusions about the role and relevance of mathematics today.

After completion of the course, a student will be able to:

- express analyses and arguments around original mathematical texts orally and in written form in a structured and scientific way
- ask relevant and creative historical questions
- express own thoughts about societal aspects of mathematics such as the structure of society, politics, and gender, both in the past and the present
- sketch the development through history of several mathematical ideas, mathematical subjects, and frameworks in which mathematics was done
- sketch important contributions, biographies and the social context of several prominent historical mathematicians.

Course contents

Content

- Historical periods: • Mathematics in Babylon and Egypt • Classical Greek mathematics • Arabian mathematics • European mathematics during the middle ages and the early modern period • European mathematics in the 19th century • Aspects of 20th-century mathematics up to the present
- Mathematics developments: • The notion and notation of numbers • Geometry • Solving equations • equations • Functions • Calculus and analysis • Probability theory • Abstract algebra • Foundations: logic, set theory, philosophy of mathematics
- Historical methods: • Different ways to read a historical (mathematical) text • Questions informing the reading of a text: mathematical content, author, reader, style, tone, type of text (e.g. letter, textbook, article, commentary), language, typesetting/script • Finding relevant and interesting topics of discussion based on one or more texts • Finding relevant and high-quality sources supporting a discussion • Structuring and formulating convincing arguments, both orally and in written form
- Analyses: • Motivations to do mathematics • The mathematical profession through history • Mathematicians' social context • Transmission of mathematical ideas • Notation and its relevance • Mathematical disputes and their consequences • Rigor • Women in mathematics • The role of a mathematician as teacher and researcher • The institutions of mathematics: monasteries, schools, universities, research institutes, conferences; prizes and distinctions, competitions, grants • The reception of mathematics in popular culture

Disposition

Lectures, writing essays with feedback from the teacher and the peers, exercises, group work with original texts, discussions, role play.

Course literature

No required course book. Texts will be distributed in class. Recommended literature:

- Jacqueline Stedall: **Mathematics Emerging: A Sourcebook 1540–1900**, Oxford University Press, 2008.
- Benjamin Wardhaugh: **How to Read Historical Mathematics**, Princeton University Press, 2010.
- Victor J. Katz, **A History of Mathematics: An Introduction**, Pearson, tredje upplaga 2009 eller **A History of Mathematics: Brief Version**, Pearson, första upplaga 2004.

Examination

- TEN2 - Examination, 6.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

The course concludes with a final exam.

During the course, it is possible to earn bonus points for the seminar at several occasions:

- 4 short written tests
- 4 essays
- peer review of essays

The exam can be completely replaced by bonus points, but not for the higher grades (A or B) at least a part of the final exam has to be done.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.