Universidad Zaragoza

27039 - History of Mathematics

Syllabus Information

Academic Year: 2021/22
Subject: 27039 - Historia de las matemáticas
Faculty / School: 100 - Facultad de Ciencias
Degree: 453 - Degree in Mathematics
ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Optional
Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It is focused on the application of basic knowledge on historical development of mathematics to case studies based on primary sources.

Teaching and learning tasks consist of lectures on history of mathematics, teacher-guided practice sessions on analysis of primary sources (case studies based on historical mathematical texts), and writing a team-based assignment (2-3 students/team) on a historical mathematical text (text understanding and analysis, the author?s biography in his/her scientific and social context, and the scientific relevance of the text).

Students are expected to participate actively in class and tutorials throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials, including a discussion forum.

4.2. Learning tasks

This 6 ECTS course is organized as follows:

1. Lectures on history of mathematics and problem-solving practice sessions (teacher-guided case studies based on historical mathematical texts) [60 hours].
2. Task: writing a teacher-guided team-based assignment (2-3 students/team) on a historical mathematical text (text understanding and analysis, the author?s biography in his/her scientific and social context, and the scientific relevance of the text) [45 hours].

4.3. Syllabus

This course will address the following topics:

1. Introduction, objectives and methodology. The origins of mathematics (Prehistory)
2. Mathematics in Antiquity: the Bronze Age (Egypt and Mesopotamia) and the Iron Age (Ionian awakening, Classic

and Hellenistic periods).

3. Medieval mathematics: Far East Asia (China and India), Arabic mathematics, Latin West.
4. Renaissance mathematics: trigonometry, calculation methods and algebra.
5. The Scientific Revolution: analytic geometry and infinitesimal calculus.
6. The Enlightenment: the development of infinitesimal methods and applications.
7. The Industrial Revolution (18th-19th centuries): descriptive geometry, algebraic equations, probability calculus, foundations of analysis, numerical systems, function theory.
8. The Industrial Revolution (19th century): applied mathematics (analytical mechanics and mathematical physics) and algebra (theory of determinants and matrices, quaternions and vector algebra, structural algebra).
9. The Industrial Revolution (19th century): higher geometry and set theory.
10. The 20th century: mathematical logic and modern algebra, functional analysis, probability theory, linear optimization and computation.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class. Please refer to the Faculty of Sciences website (https://ciencias.unizar.es/) and Moodle.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27039