27039 - History of Mathematics

Syllabus Information

Academic Year: 2019/20
Subject: 27039 - History of Mathematics
Faculty / School: 100 -

Degree: 453 - Degree in Mathematics

ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Optional
Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

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. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions.

4.2.Learning tasks

This course is organized as follows:

- **Lectures / problem-solving sessions** (60 hours). The teacher will explain the history of mathematics, and problem-solving based on original sources will take place.
- **Practice sessions**. Teacher-guided case studies based on historical mathematical texts.
- **Task**: writing a group assignment (2-3 students/team) explaining events, procedures, ideas, and concepts in a historical mathematical text.

4.3.Syllabus

This course will address the following topics:

- **Topic 1**. **Introduction, objectives and methodology**. The origins of mathematics (Prehistory)
- **Topic 2**. **Mathematics in Antiquity**: The Bronze Age (Egypt and Mesopotamia) and the Iron Age (Ionian awakening, Classic and Hellenistic Periods)
- **Topic 3**. **Medieval Mathematics**: Far East Asia (China and India), Arabic mathematics, the Latin West.
- **Topic 4. Renaissance mathematics**: Trigonometry, Calculation methods and Algebra.
- **Topic 5**. **The Scientific Revolution**: Analytic Geometry and Infinitesimal Calculus.
- **Topic 6**. **The Enlightenment**: The development of infinitesimal methods and applications.
- **Topic 7**. **The Industrial Revolution** (18th-19th centuries): Descriptive Geometry, Algebraic equations, Probability Calculus, Foundations of Analysis, Numerical systems, Function Theory.
- **Topic 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).
- **Topic 9**. **The Industrial Revolution** (19th century): Higher Geometry and Set theory.
- **Topic 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 or please refer to the Faculty of Sciences website (https://ciencias.unizar.es/) and Moodle.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=27039&year=2019