

M117	<b>History of Mathematics</b>	L	P	S	ECTS 4
		3	0	0	

**Course objective.** Students will become familiar with the development of the major mathematical ideas throughout history. Students will re-learn previously met mathematical concept in regard to the historical aspect. This provides knowledge of a variety of examples from the history of useful for the future work of teachers of mathematics, as well as their general culture. Also, students will get to know the connections of mathematics with other professions and social development.

**Prerequisites.** Undergraduate mathematics or computer science study programme.

**Course content.** The first part deals with the old historical periods up to and including the Renaissance in chronological order, while the second part deals with the modern mathematics to develop certain mathematical disciplines.

1. Early mathematics: ancient Egyptian and Sumerian-Babylonian Mathematics. Ancient Greek mathematics: pre-euclidian, Euclidean and post-euclidean; mathematics in the Roman Empire.
2. Mathematics of non-European nations: India, China. Arab and European mathematician of the Middle Ages.
3. Renaissance: development of mathematical notation, the development of algebra, discovery of logarithms, applications of mathematics in physics, astronomy and art.
4. The development of mathematical analysis after the renaissance: predecessors, discovery and development of calculus; series, continuity; complex numbers.
5. Probability theory: the origin and development to axiomatization.
6. The development of geometry after the Renaissance: discovery of projective and analytic geometry, non-Euclidean geometry. The emergence of topology.
7. The development since the Renaissance algebra: beginnings of group theory, matrix theory, vector spaces, basic algebraic theorem.
8. The development of number theory in the new century.
9. The emergence of set theory. A short review of mathematics in the XX. Century. And the most recent outcomes.

### LEARNING OUTCOMES

No.	LEARNING OUTCOMES
1.	Describe counting, claim proving and task solving through the history of mathematics.
2.	Connect and argument the causes and consequences for the development of mathematical ideas and methods.
3.	Report on key events in the biographies of the world's great mathematicians.
4.	Explain the impact and contribution of the world's great mathematicians.
5.	Connect and explain the chronological development of certain branches of mathematics.
6.	Assess and recommend that the historical facts, stories and contributions can be effectively used in teaching mathematics to interested and motivated students.

### RELATING THE LEARNING OUTCOMES, ORGANIZATION OF THE EDUCATIONAL PROCESS AND ASSESSMENT OF THE LEARNING OUTCOMES

TEACHING ACTIVITY	ECTS	LEARNING OUTCOME **	STUDENT ACTIVITY*	EVALUATION METHOD	POINTS	
					min	max

Attending lectures	0.4	1.2	Attending classes, discussions	Attendance lists, tracking activities	0	10
Seminar	0.4	1,2,3,4	Write seminar paper	Public presentation	0	10
Written exam (Mid-terms)	2.8	1,2,3,4,5	Preparing for written exams	Verification of correct answers (evaluation)	40	80
Final exam	0.4	6	Revising	Oral exam	0	10
TOTAL	4				40	110

**Teaching methods and knowledge assessment.** Lectures are required. The exam consists of written and oral part, taken after the lectures. During semester students can write mid-terms which can replace a part of the written exam or the whole written exam. The students have to present seminar which will be assessed as well.

**Can the course be taught in English:** Yes

**Basic literature:**

1. F. M. Brueckler: Povijest matematike I, Odjel za matematiku Sveučilišta J. J. Strossmayera u Osijeku, 2014.
2. F. M. Brueckler: Povijest matematike II, Odjel za matematiku Sveučilišta J. J. Strossmayera u Osijeku, 2010.

**Recommended literature:**

1. Ž. Dadić: Povijest ideja i metoda u matematici i fizici, Školska knjiga, Zagreb, 1992.
2. Z. Šikić, Kako je stvarana novovjekovna matematika, Školska knjiga, Zagreb, 1989.
3. Š. Znam i dr., Pogled u povijest matematike, Tehnička knjiga Zagreb, 1989.
4. The MacTutor History of Mathematics Archives: <http://www-groups.dcs.st-and.ac.uk/~history/>
5. W. S. Anglin, J. Lambek: The Heritage of Thales, Springer Verlag, Berlin, 1995.
6. D. E. Smith: History of Mathematics - Vol. I, Dover, New York, 1958.
7. D. E. Smith: History of Mathematics - Vol. II, Dover, New York, 1953.