

M071	Elective - Year 5	Projective Geometry	L+P+S 2+1+0	ECTS 3
------	----------------------	----------------------------	----------------	-----------

Course objectives. To inform students about the basic concepts, results and assertions of projective geometry, which lays the foundations for the study of other geometries.

Course prerequisites. Elementary Geometry.

Syllabus.

1. Axioms of the projective geometry.
2. Pappus-Pascal's and Desargues's theorem.
3. Harmony.
4. Perspectivities and projectivities. The fundamental theorem of projective geometry.
5. Collineations and correlations.
6. Polarity.
7. Conics.
8. *Algebraization* and coordinatisation of a projective plane.
9. Analytic construction of the real projective plane.
10. Geometry of the affine plane.
11. Geometry of the Euclidean plane.

Expected learning outcomes.

After completing the course, students are expected to:

- demonstrate understanding of concepts introduced in projective geometry;
- formulate and apply dual assertions of the definitions and theorems;
- demonstrate the knowledge of the proof and the application of basic theorems of projective geometry;
- distinguish between an axiomatic and an analytical approach to projective geometry;
- show an argumentative use of mathematical claims and formulas in solving problem;
- interpret mathematical terms introduced during the course.

Teaching methods and student assessment. Lectures and exercises are obligatory. The final exam follows after the completion of lectures and exercises and it consists of two parts, i.e. a written and an oral part. During the semester students have two mid-term exams which cover the whole material. Acceptable results achieved in mid-term exams taken throughout the semester replace the written part of the exam.

Can the course be taught in English: Yes.

Basic literature:

1. H. S. M. Coxeter, Projective geometry, 2nd edition, Springer Verlag, 2003.

Recommended literature:

1. D. Palman, Projektivna geometrija, Školska knjiga, Zagreb, 1984.