Study programme(s): Master in Mathematics Teaching (MP), Mathematics (MA)

Level: master

Course title: Theory of Curves and Surfaces (MA-08)

Lecturer: Sanja V. Konjik

Status: Obligatory

ECTS: 5

Requirements: ---

Learning objectives

Acquiring knowledge and skills in the selected topics of the theory of curves and surfaces.

Learning outcomes

Students should be able to apply the acquired knowledge and skills to specific problems.

Syllabus

Theoretical classes

Regular curves in R^n, the arc length, Frenet curves in R^n, plane and space curves, the tangent vector, normal and binormal vectors, the curvature, the torsion, the Frenet equations and the fundamental theorem of the local theory of curves, spherical curves, the global theory of curves, surfaces in R^3, the first fundamental form, the Gauss and Weingarten maps, the second fundamental form, curvatures (normal, geodesic, principal, Gauss, mean), the intrinsic geometry of surfaces, the covariant derivative, the Lie derivative, parallel displacement, geodesics, the Gauss and Weingarten equations, the Gaus Theorema Egregium, the fundamental theorem of the local theory of surfaces

Practical classes

Application of knowledge gained in theoretical classes and in solving practical problems (exercises).

Literature

- Kühnel, W., Differential Geometry, Curves-Surfaces-Manifolds, 2nd edition, AMS, USA, 2006.
- Banchoff, T., Lovett, S., Differential Geometry of Curves and Surfaces, A K Peters, Ltd., Natick, 2010.
- O'Neill, B., Elementary Differential Geometry, Revised 2nd edition, Elsevier Inc., USA, 2006.
- Blažić, N., Bokan, N., Uvod u diferencijalnu geometriju, Vesta, Matematički fakultet, Beograd, 1996.
- Dragović, V., Milinković, D., Analiza na mnogostrukostima, Matematički fakultet, Beograd, 2003.

Weekly teaching load				Other: 0
Lectures: 3	Exercises: 1	Other forms of teaching: 0	Student research: 0	

Teaching methodology

Oral presentation by the teacher, exchange of opinions between teachers and students, problem solving, combined methods, use of computers in teaching, group work, students' individual work.

Grading (maximum number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Activity during lectures	10	Written exam	
Practical classes		Oral exam	50
Colloquia			
Seminars	40		