Study programmes: MASTER STUDIES - Mathematics

Course name: Rational Mechanics

Lecturers: Andjelka Kovačević

Status: Optional

ECTS: 8

Attendance prerequisites: -

Course aims: Study of qualitative aspects and connections between phenomena in classical mechanics and various fields of mathematics and physics.

Course outcome: Students are able to understand and apply ideas and methods of symplectic geometry in physics, applied mathematics as well as in itself mathematics.

Course content: Galilean group and Newton's equations. Equations of motion. Systems with 1 and 2 degrees of freedom. A field of conservative forces. The angular momentum. Motion in the central field. Motion of the point in the 3 dimensional space. Motion of system of n points. Similarity method. Variation calculus and Lagrange's equations. Legendre's transformation. Hamiltonian equations. Liouville's theorem. Lagrange's mechanics on manifolds. Oscillations. Solid bodies. Hamiltonian mechanics.

Literature:

1. V.I. Arnold: Mathematical methods of classical mechanics, Second Edition, Springer Verlag, 1991.

Number of hours: 7	**Lectures**: 3	**Tutorials**: 2	**Laboratory**: -	**Research**: 2

Teaching and learning methods: Frontal / Individual / Interactive / Tutorials / Lectures / Exercises

Assessment (maximal 100 points)

Course assignments	**points**	**Final exam**	**points**
Lectures	15	Written exam	25
Exercises / Tutorials	15	Oral exam	25
Colloquia	20	Written-oral exam	-
Essay / Project	-		