# Classical mechanics MT

*Topics*

1. Galilean spacetime, Galilean transformation.
2. Constrained motion, Lagrange multipliers, d'Alembert principle, generalized coordinates.
3. Deriving Lagrange equations form d'Alembert principle.
4. Variational calculus, the principle of least action.
5. Noether's theorem.
6. Central-force problem.
7. Kepler's problem.
8. Small oscillations of systems with several degrees of freedom.
9. Hamilton's equations, phase space.
10. Poisson brackets.
11. Symplectic transformations.
12. Hamiltonian flow as a symplectic map.
13. Generating functions for canonical transformations.
14. Hamilton-Jacobi equation.
15. Liouville integrability.
16. Action-angle coordinates, multiply periodic motion.
17. Poincaré sections, KAM theorem.