Study programmes: BACHELOR STUDIES – Astronomy and Astrophysics

Course name: Quantum Mechanics 1

Lecturers: Milan Damnjanović and other lecturers

Status: Optional

ECTS: 7

Attendance prerequisites: Mathematical physics 1, Theoretical mechanics

Course aims: Clarification of the principles of quantum physics and basic diffrences with respect to classical one, elementary techniques.

Course outcome: Quantum knematics, basic quantum dynamics, Schrodinger equation and solutions of the most important problems.

Course content:

1. Quantum kinematics: states, superposition. 2. Obsevables, measurements, correlations. 3. Uncertainty relations. 4. Quantization. 5. Schrodinger's, Heisenberg's and Dirac's picture. 6.Dynamics: evolution, Schrodinger equation (time dependentnt and time independent). 7.Evolution of the mixed states, averages, uncertainty relation energy-time. 8. Elementary dynamical problems: picewise constant potentials. 9. Harmonic oscilaor. 10. Approxmate methods 1.: time independent perturbations. 11. Variational method. 12. Adiabatic approximation. 13. Quantization of the Galileo's group. 14. Rotations and angular momentum. 15. Hydrogen atom. 16. Spin

Literature:

1. C. Cohen-Tannoudji, B. Diu, F. Laloe, Quantum Mechanics, (J. Wiley & Sons, New York, 1977)
2. M. Damnjanović, Lecture notes
3. L.D. Landau, E.M. Lifshitz,"Quantum Mechanics" (Pergamon: Oxford 1977)

Number of hours: 5	**Lectures**: 3	**Tutorials**: 2	**Laboratory**: -	**Research**: -

Teaching and learning methods:

Exercises, discussions, seminars, homeworks.

Assessment (maximal 100 points)

Course assignments	points	Final exam	points
Lectures	10	Written exam	50
Exercises / Tutorials	-	Oral exam	40
Colloquia	-	Written-oral exam	-
Essay / Project	-		