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| **Study programmes**: BACHELOR STUDIES – Astronomy and Astrophysics | |
| **Course name**: Mechanics | |
| **Lecturers**: Božidar Nikolić and other lecturers | |
| **Status**: Compulsory | |
| **ECTS**: 10 | |
| **Attendance prerequisites**: No prerequisites. | |

**Course aims**: Understanding of the basic laws of mechanics: Newton laws and conservation laws. Attaining a skill of estimation based on the solid physical ground.

**Course outcome:** Capability to solving standard problems, based on clear understanding of basic mechanical principles.

**Course content**:

**Kinematics:** Basic definitions: velocity and acceleration. Kinematics of the rigid body. Angular velocity and acceleration. Planar motion of the rigid body. Velocity and acceleration in different coordinate frames. **Dynamics:** Newton's laws. Force. Initial conditions. Noninertial systems and inertial forces. **Conservation laws:** Momentum. Momentum conservation law. Work, power and kinetic energy. Conservative and central forces. Mechanical energy. Energy conservation law. Angular momentum conservation law. **Special problems in classical mechanics:** Rotation of the rigid body. Newton's law of gravitation. Kepler's laws. Kepler's problem. Gravitational potential energy. Periodic motion. Pendulum.

**Literature**:
1. D. Krpić, Mechanics, Faculty of Physics 2005. (in serbian)
2. I. E. Irodov, Fundamental Laws of Mechanics, Mir Publishers (1980)
3. Young & Freedman, University Physics vol. 1, 11th ed., Pearson Addison Wesley (2004)

| **Number of hours**: 10 | **Lectures**: 4 | **Tutorials**: 3 | **Laboratory**: 3 | **Research**: - |
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**Teaching and learning methods**:
Lectures, exercises, group discussions, homework, essays.

| Assessment (maximal 100 points) | | | | |
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| **Course assignments** | **points** | **Final exam** | **points** | |
| Lectures | - | Written exam | 40 | |
| Exercises / Tutorials | 10 | Oral exam | 30 | |
| Colloquia | - | Written-oral exam | - | |
| Essay / Project | 20 | | | |