Study programme: Astronomy and Astrophysics – PhD Studies

Course: Theory of Motion of Artificial Earth Satellites

Teacher or teachers: Dušan Marčeta

Status: optional

ECTS credits: 9

Requirements: none

Course objective: Acquiring advanced knowledge in astrodynamics and application to the motion of the Earth's artificial satellites.

Course outcome: Upon completion of the course, the student has advanced knowledge of satellite motion in the Earth's gravitational field, including disturbances due to the gravitational actions of the Sun and Moon, as well as non-gravitational effects such as solar radiation pressure and atmospheric drag.

Course description:
Modeling of the Earth's gravitational field, differential equations of motion in the Earth's orbit, disturbances due to zonal harmonics, disturbances due to tesseral and sector harmonics, disturbances due to the gravitational action of the Sun and Moon, Earth's atmosphere, models of the Earth's atmosphere, disturbances due to atmospheric drag, disturbances due to solar radiation pressure , maneuvers in orbit, altitude maneuvers, maneuvers to change the inclination of the orbit, lifetime of satellites, orbital debris, classification of orbits, classification of artificial satellites, cube-satellites.

Recommended literature:

Michael Capderou, Satellites Orbits and Missions, Springer-Verlag France, 2004

Total number of classes: 10	**Theoretical classes**: 4	**Practical classes**: 6

Teaching methods:
Ex cathedra, group work, student research

Grading system (maximum number of points: 100)

Pre-exam requirements	points	**Final exam**	points
Activity in class		Written exam	40
Practical work	30	Oral exam	30
Colloquia			
Seminars			