Study programme: Astronomy and Astrophysics – PhD Studies	
Course: Orbital Mechanics	
Teacher or teachers: Dušan Marčeta	
Status: optional	
ECTS credits: 9	
Requirements: none	
Course objective: Acquiring advanced knowledge in specific areas of astrodynamics.	

Course outcome: Upon completion of the course, the student has advanced knowledge about motion in a very complex dynamic environment. This includes knowledge about modeling highly irregular gravitational field of planets, asteroids, and comets, as well as motion in those fields including non-gravitational influences such as the atmosphere drag and solar radiation pressure. The student also has knowledge about the influence and modeling of cometary activity on the motion of comets and interstellar objects through the solar system.

Course description:
Modeling of irregular gravitational field of spheroidal celestial bodies (planets), spherical harmonics, ellipsoid potential, gravitational anomalies, modeling of the gravitational field of very irregular bodies (asteroids and comets), polyhedral gravitational model, motion in a complex gravitational field, motion relative to rotating celestial body, influence of planetary atmosphere on orbital motion, influence of cometary activity on the motion of comets and interstellar objects through the solar system, influence of solar pressure on the motion of objects and particles in the solar system (Poynting-Robertson effect, Yarkovsky effect).

Recommended literature:

Daniel J. Scheeres, Orbital Motion in Strongly Perturbed Environments - Applications to Asteroid, Comet and Planetary Satellite Orbiters, Springer-Verlag Berlin Heidelberg, 2012

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			