

Level: master			
Course title: Cosmology and extragalactic astronomy			
Status: compulsory			
ECTS: 8			
Requirements:			
Learning objectives Acquiring general and specific knowledge in cosmology and extragalactic astronomy			
Learning outcomes After the course, the student should have developed the following: <ul style="list-style-type: none"> - General competences: Student can use different astronomical software, search online databases, knows how to plot different data and results, and write the report on specific practical project. - Specific course competences: Student has advanced knowledge in extragalactic astronomy: large scale structure, properties of extragalactic objects, observational aspects, catalogues and databases, and is capable for independent scientific research in this field. 			
Syllabus <i>Theoretical instruction</i> Short history of extragalactic astronomy from the beginning of the 20th century. Structure and kinematics of the Milky Way. Properties of supermassive black holes and Sgr A*. Galaxy classification and Hubble sequence. Spiral galaxies. Spiral galaxy rotational curves. Elliptical galaxies. Fundamental relations (Tully-Fischer, Faber-Jackson, fundamental plane, luminosity function). Formation and evolution of galaxies. Close encounters and galaxy collisions. Active galactic nuclei (AGN). AGN classification, observational properties and unified model. Gravitational lenses. Galaxy clusters, classification and properties. Intergalactic matter. Cosmological distance scales. Methods for determining cosmological distances. Large scale structure. Contents, history and origin of the Universe. Cosmological redshift. Cosmological models. Cosmological parameters. Observational tests of cosmological models. Dark matter. Dark energy. Big Bang. Evolution of the Universe. <i>Practical instruction</i> Catalogues and databases (introduction to different databases, e.g. SDSS, NED, etc., data-mining, classification of extragalactic objects, k-correction, estimate of the mass of the supermassive black hole in AGN). 1. Carroll and Ostlie, An Introduction to Modern Astrophysics, 2. Ćirković, M. M. 2008, Uvod u vangalaktičku astronomiju, Univerzitet u Novom Sadu, Novi Sad 3. Popović, L., Ilić, D., 2017, Aktivna galaktička jezgra, Matematički fakultet, Beograd 3. Sparke, L.S., Gallagher, J.S 2000, Galaxies in the Universe: An Introduction, Cambridge University Press, Cambridge			
Weekly teaching load			Other:
Lectures: 5	Exercises: 3	Other forms of teaching: 1+1	