

Study programmes: Bachelor studies – Astronomy and Astrophysics				
Course name: General astrophysics 2				
Lecturers: Olga Atanacković				
Status: Compulsory				
ECTS: 6				
Attendance prerequisites: None				
Course aims: Acquiring general and specific knowledge of astrophysics				
Course outcome: At the end of the course, student knows the basic concepts of stellar evolution, physics of stellar systems, extragalactic astronomy and cosmology. Student has enough skills for solving many different problems from those areas.				
Course content: Binary stars. Classification. Visual binaries. Mass-Luminosity relation. Dynamical parallax. Spectroscopic binaries. Eclipsing binaries. Determination of stellar masses in binary system. Stellar rotation. Close binary stars. Stellar clusters. Galactic (open) clusters. Globular clusters. Stability of clusters. Color-magnitude diagram for stellar clusters. Stellar associations. Our galaxy – Milky Way. Morphology and structure of the Galaxy. Stellar populations. Hydrogen clouds. Galactic center. Rotation of the galaxy. Mass of the Galaxy and dark matter problem. Interstellar medium. Composition and structure. Gaseous component. Neutral hydrogen. Structure and distribution of gas in Galaxy. Dust. Interstellar extinction and reddening. Composition and structure of dust grains. Nebulae. Dark nebulae. Reflection nebulae. Emission nebulae (HII regions, planetary nebulae, supernova remnants (SNRs)). Cosmic rays. Magnetic field. Gravitational field. Stellar evolution. Basic phases of stellar evolution. Pre-main-sequence phase. Main-sequence phase. Post-main sequence phase (subgiant and red giant branch). Final stages of stellar evolution (white dwarfs, neutron stars and black holes). Pulsars. Stellar evolution in close binary systems. Double neutron star binaries and general relativity effects. Pulsars' reincarnation. Variable stars. Characteristics and classification. Pulsating variable stars (RR Lyrae, Cepheids, Mirides). Cataclysmic variables. Novae (classical, recurrent and dwarf novae). Supernovae. Extragalactic astronomy. Morphological classification of galaxies. Hubble's law. Determination of Hubble constant and extragalactic (cosmic) distance ladder. Physical classification of galaxies. Active galaxies. Quasars. Galaxy groups and clusters. Cosmological models. Big bang. Cosmic microwave background radiation.				
Literature: 1. M. Vukićević-Karabin, O. Atanacković: 2010, <i>Opšta astrofizika</i> , Zavod za udžbenike, Beograd. Exercises: 1. http://nikolavitas.blogspot.com/p/old-course-materials-in-serbo-croatian.html 2. http://poincare.matf.bg.ac.rs/~donic/vezbe.html				
Number of hours: 5	Lectures: 2	Tutorials: 2 + 1	Laboratory: -	Research: -
Teaching and learning methods: Frontal / Group / Practical/Lectures/Exercises				
Assessment (maximal 100 points)				
Course assignments	points	Final exam	points	
Lectures	-	Written exam	20	
Exercises / Tutorials	10	Oral exam	40	
Colloquia	20	Written-oral exam	-	
Essay / Project	10			