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| Study programmes: Bachelor studies – Astronomy and Astrophysics | | | | |
| Course name: General astrophysics 1 | | | | |
| 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 astrophysics. Student understands basic physical laws and physical processes on celestial objects, such as stars and planets. Student has enough skills for solving many different problems. | | | | |
| Course content: | | | | |
| Introduction. Subject, methods, division and importance of astrophysics. A brief overview of the history of astrophysics and the development of astronomy. | | | | |
| Electromagnetic radiation of celestial bodies and methods for its measurement. Observable characteristics of electromagnetic radiation and methods of their measurement (photometry, spectroscopy and polarimetry). Mechanisms and laws of radiation. The influence of the Earth's atmosphere on astronomical observations. Optical telescopes. Radio-waves and radio astronomy. Radio telescopes. Astronomy from beyond the Earth's atmosphere. | | | | |
| Characteristics of stable stars. Distances to the stars. Stellar motions. Apparent stellar magnitude. Visual, photographic, photoelectric (UBV) and bolometric magnitudes. Color index. Stellar luminosity. Absolute stellar magnitude. Stellar spectra and their classification. Hertzsprung-Russell (H-R) diagram. Spectral parallax. Determination of stellar radii. | | | | |
| Stellar structure. Stellar atmospheres. Chemical composition and physical conditions on stars. Internal stellar structure. Models of stellar interiors. Stellar energy sources. Gravitational contraction. Thermonuclear reactions. Neutrino problem. Asteroseismology. | | | | |
| Sun. General characteristics. Solar interior. Helioseismology. Solar atmosphere. Photosphere. Chromosphere. Corona. Solar wind. Solar magnetic field. Forms of solar activity (sunspots, prominences, flares). | | | | |
| Solar system. General characteristics. General characteristics of the planets. Earth, Moon, Earth-like planets (Mercury, Venus, Mars). Jupiter-like planets (Jupiter, Saturn, Uranus, Neptune). Dwarf planets and asteroids. Comets. Meteors and meteorites. The formation of the Solar system. Extrasolar planetary systems. | | | | |
| 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 | 30 | |
| Exercises / Tutorials | 10 | Oral exam | 40 | |
| Colloquia | 20 | Written-oral exam | - | |
| Essay / Project | - | | | |