Study programmes: Bachelor studies – Astronomy and Astrophysics	
Course name: Radio astronomy	
Lecturers: Dejan Urošević	
Status: Compulsory	
ECTS: 5	
Attendance prerequisites: None	
Course aims: Acquiring basic knowledge in radio astronomy	
Course outcome: At the end of the course student has enough knowledge for advanced courses in radio astrophysics and all other courses concerned with interstellar medium on master and PhD level of studies. Student is capable to join in scientific research.	
Course content: **Introduction.** Radio-sky map. Production mechanism of radio radiation. Synchrotron radiation. Bremsstrahlung radiation. Mechanism with less influence on total amount of detected radio radiation. Some elementary definitions. Short introduction to radio telescopes. **SIGNLE DISH ANTENA RADIO ASTRONOMY** **Fundamentals of antenna theory.** Electromagnetic potentials. Hertz dipole. Total amount of radiation from Hertz dipole. Reversibility theorem. Antenna parameters. Power diagram $P(\theta,\varphi)$. Spatial antenna angles, main and side lobes. Effective aperture. Nyquist theorem and noise temperature – antenna temperature. **Fundamental theorems of radio astronomy.** Furie transformations. Spherical frequencies. Fundamental theorem of radio astronomy – simplified representation. Fundamental theorem of radio astronomy – detailed representation. Finite source radiation field. Aperture distribution of electric field and antenna power diagram. Power diagram for rectangular antenna with uniform field distribution. Circular aperture. Convolution. Autocorrelation theorem of electric field aperture distribution. Convolution theorem of brightness temperature and antenna power diagram. Relation between flux and antenna temperature of brightness temperature. Sampling theorem. **RADIO INTERFEROMETRY** **Spatial (spherical)coherence.** Spatial coherence function. Measurements on single plane. Point sources. Discreet samples. Receiving diagram element. Spectroscopy. **Interferometry in practice.** Spreading of semi-permeable frequency range.	
Literature: Д. Урошевић, Ј. Милоградов-Турин: Теоријске основе радио-астрономије, Математички факултет, Београд, 2007 Exercises: T. L. Wilson, S. Huttemeister: Tools of Radio-Astronomy (Problems and Solutions), Springer-Verlag, Berlin, Heidelberg, 2000.	

Number of hours: **4**	Lectures: **2**	Tutorials: **2**

Teaching and learning methods: Frontal, Group work, Exercises

Assessment (maximal 100 points)			
Course assignments	**points**	**Final exam**	**points**
Lectures	20	Written exam	30
Exercises / Tutorials	20	Oral exam	30
Colloquia			
Essay / Project			