

Study program: PhD studies – Astronomy and astrophysics			
Course Title: Selected chapters of modern cosmology			
Teacher: Vukmanovic M. Olga			
Status of course: optional			
Credits: 9			
Pre-requisites: none			
Course goal: The acquisition of advanced knowledge of modern cosmology.			
Summary of Intended Learning Outcomes: Upon completion of the course, PhD student is capable of understanding problems in modern cosmology and the capability for further research work in this field.			
Course content: Thermal history of the Universe. Distribution function in the early Universe. Synthesis of light elements. Separation of the matter and radiation. Matter in the Universe. Baryonic dark matter. Non-baryonic dark matter. Hot dark matter (HDM). Cold dark matter (CDM). Hubble’s constant. Measuring the Hubble’s constant. Distribution of the galaxies across the Universe. Correlation function. Evolution of the galaxies. Black holes in the active galaxies. Origin of structures in the Universe. Dynamics of the linear perturbations. N-body models- cosmological simulations. Non-linear models. Origin of galaxies in the Universe. Hierarchies and Press-Schechter approach. Cooling and intergalactic matter. Chemical evolution of the galaxies. Background radiation. Fluctuation mechanism. Detection and properties of CMB (cosmic background radiation).			
Literature: 1. T. Padmanabhan 1993, Structure Formation in the Universe, Cambridge Univ. Press., 2. P.J.E. Peebles 1993, Principles of Physical Cosmology, Princeton University Press, 3. E.W. Kolb & M.S. Turner 1994, The Early Universe, Addison-Wesley Publishing Co. 4. T. Padmanabhan 1996, Cosmology and Astrophysics Through Problems, Cambridge University Press 5. J.A. Peacock: 1999, Cosmological Physics, Cambridge University Press			
Number of teaching hours: 10		Theoretical lessons: 4	Practical lessons: 6
Methods of teaching: Frontal, Group, Individual Research Approach			
Grading Score (maximum 100 points)			
Pre-exam obligations		Final exam	
In-class activity		Written exam	
Practical training		Oral exam	50
Midterm			
Seminars			