

Study program: Astronomy and Astrophysics - PhD studies			
Course: Selected topics of modern cosmology			
Teacher or teachers: Predrag Jovanović			
Status: optional			
ECTS Credits: 9			
Requirements: none			
Course objective: The acquisition of advanced knowledge of modern cosmology.			
Learning outcome: 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 description: 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).			
Recommended literature: T. Padmanabhan 1993, <i>Structure Formation in the Universe</i> , Cambridge Univ. Press., P.J.E. Peebles 1993, <i>Principles of Physical Cosmology</i> , Princeton University Press, E.W. Kolb & M.S. Turner 1994, <i>The Early Universe</i> , Addison-Wesley Publishing Co. T. Padmanabhan 1996, <i>Cosmology and Astrophysics Through Problems</i> , Cambridge University Press J.A. Peacock: 1999, <i>Cosmological Physics</i> , Cambridge University Press			
Total number of classes: 10		Theoretical classes: 4	Practical classes: 6
Teaching methods: Frontal, Group, Individual Research Approach			
Grading system (maximum number of points: 100)			
Pre-exam requirements	points	Final exam	points
Activity in class	10	Written exam	
Practical work		Oral exam	50
Colloquia	40		
Seminars			