

Course Unit Descriptor

Study Programme: Master Academic Studies in Physics		
Course Unit Title: Selected unsolved problems in astrophysics		
Course Unit Code: M18INPA		
Name of Lecturer(s): Full Professor Tijana Prodanovic		
Type and Level of Studies: Master Academic Degree		
Course Status (compulsory/elective): Elective		
Semester (winter/summer): Summer		
Language of instruction: English		
Mode of course unit delivery (face-to-face/distance learning): Face-to-face		
Number of ECTS Allocated: 8		
Prerequisites: None		
<p>Course Aims:</p> <p>The goal of this course is to give students insight into open questions and hot research topics in astrophysics, which will help them later in choosing the area of research where in which they want to obtain a PhD.</p>		
<p>Learning Outcomes:</p> <p>After the completion of this course students will be familiarized with cutting edge research in the field of astrophysics. They will be able to read scientific papers with critical cruitiny. Students will be given a taste of current open questions and hot topics. Through their work on the term paper they will be familiarizet with the most up to date research related to a specific topic which will help them to easily join research teams.</p>		
<p>Syllabus:</p> <p><i>Theory</i></p> <p>Dark matter; Dark energy; Inflation; Primordial lithium problem; Population III stars; Deuterium; Neutrino astrophysicas and open questions; Origin and acceleration of untra high energy cosmic rays; Extra galloctic gamma ray background origin; Galactic gamma ray excesses; Gamma ray bursts; Extrasollar planets and life beyond Earth; Interplanetary missions; Modeling supernova explosions; Gravitational waves.</p> <p><i>Practice</i></p> <p>In order for students to better adopt freshly learned concepts a lot of attention will be given to practical exercises and problem solving by applying physical laws and models on astrophysical systems, which will be of help in completing homework problem sets and help students prepare for written part of the exam.</p>		
<p>Required Reading:</p> <p>1. S. Dodelson, Modern Cosmologz, Elsevier, 2003, ISBN-13:978-0122191411.</p>		
Weekly Contact Hours:	Lectures: 3	Practical work: 2
<p>Teaching Methods:</p> <p>Lectures, practical work and seminars.</p>		
Knowledge Assessment (maximum of 100 points):		

Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	30
Practical work	20	oral exam	30
Preliminary exam(s)		
Seminar(s)	15		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.