

DESCRIPTION OF THE COURSE OF STUDY

Course code		
Name of the course in	Polish	Ogólna teoria względności i zastosowanie do astrofizyki i kosmologii: wstęp
	English	Introduction to general relativity and applications to astrophysics and cosmology

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	physics
1.2. Mode of study	Full-time
1.3. Level of study	2 nd degree
1.4. Profile of study	General academic
1.5. Person/s preparing the course description	Prof. dr hab. Francesco Giacosa
1.6. Contact	francesco.giacosa@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites	algebra, mathematical analysis, basic physics, basics quantum mechanics, electrodynamics

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	30 hrs of lectures	
3.2. Place of classes	Courses in the UJK teaching rooms of the Faculty of Exact and Natural Science	
3.3. Form of assessment	homework	
3.4. Teaching methods		
3.5. Bibliography	Required reading	<ol style="list-style-type: none"> 1. Sean Carroll, Spacetime and Geometry: An Introduction to General Relativity 2. Carlo Rovelli, General Relativity: The Essentials 3. A. Zee, Einstein Gravity in a nutshell 4. Tomislav Prokopec, Lecture notes for Cosmology
	Further reading	<ol style="list-style-type: none"> 1. Quantum field theory in a nutshell, A. Zee. 2. J. A. Peacock, cosmological physics

5. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

5.1. Course objectives (including form of classes)
<p>Knowledge (lectures and laboratories) C1. Description of the most important features and formalism of general relativity</p> <p>Abilities (laboratories and project) C2. Understanding the physical tools related to general relativity C3. Developing skills to solve exercises related to general relativity</p>

5.2. Detailed syllabus (including form of classes)
<p>Lectures: Fundamentals of general relativity (equivalence principle, movement in a strong gravitational field, gravitational waves). Astrophysics: stability of neutron stars. Standard model of cosmology.</p>

5.3. Education outcomes in the discipline		
Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Can describe the most important features and formalism of general relativity	SD_W01 SD_W02 SD_W07
within the scope of ABILITIES:		
U01	Understand the physical tools related to general relativity	SD_U01 SD_U03 SD_U07
U02	Has skills to solve exercises related to general relativity	SD_U01 SD_U03 SD_U07

5.4. Methods of assessment of the intended learning outcomes																					
Teaching outcomes (code)	Method of assessment (+/-)																				
	Oral answer			Project			Self-study			Group work			Exam								
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	L	C	P	L	C	P	L	C	P	L	C	P	L	C	P	L	C	P	L	C	P
W01																X					
U01																X					
U02																X					

5.5. Criteria of assessment of the intended learning outcomes		
Form of classes	Grade	Criterion of assessment
lecture (L)	3	at least 50% and not more than 60% of the total number of available points
	3,5	more than 60% and not more than 70% of the total number of available points
	4	more than 70% and not more than 80% of the total number of available points
	4,5	more than 80% and not more than 90% of the total number of available points
	5	more than 90% of the total number of available points

6. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>		
<i>Participation in lectures</i>	30	
<i>Participation in laboratories/project</i>		
<i>Preparation for the exam</i>		
<i>Others</i>		
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>		
<i>Preparation for the lecture</i>		
<i>Preparation for the laboratories</i>		
<i>Preparation for the exam</i>		
<i>Gathering materials for the project</i>		
<i>Preparation of multimedia presentation</i>		
<i>Others*</i>		
TOTAL NUMBER OF HOURS	30	
ECTS credits for the course of study	2	

Accepted for execution (date and signatures of the teachers running the course in the given academic year)

.....