High-energy astrophysics - course description

General information

Course name	High-energy astrophysics
Course ID	13.7-WF-FizD-HEA-S17
Faculty	Faculty of Physics and Astronomy
Field of study	Physics
Education profile	academic
Level of studies	Second-cycle studies leading to MS degree
Beginning semester	winter term 2018/2019

Course information

Semester	3
ECTS credits to win	2
Course type	obligatory
Teaching language	english
Author of syllabus	

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Exam

Aim of the course

Consolidation and expansion of the basic concepts of high-energy astrophysics. Forward the message to enable the understanding of high-energy astrophysical processes.

Prerequisites

Knowledge from the introduction to astrophysics, compact objects, Astrophysics I and II.

Scope

- Special Theory of Relativity.
- Physics of fluids.
- Radial processes.
- Star supernovae.
- Neutron stars, pulsars and magnetars.
- Binary systems of compact objects.
- Gamma-ray bursts and gamma-ray burst afterglow.
- Active Galactic Nuclei.

Teaching methods

Lecture with exercises conventional accounting.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to use their knowledge to construct a simple research projects, as well as to present their knowledge in a popular science.		• an exam - oral, descriptive, test and other	• Lecture
Student can use the English-language literature.		• an exam - oral, descriptive, test and other	• Lecture
Student is able to carry out the bills for solving problems and issues high-energy astrophysics. Able to interpret astronomical observations carried out in the X-and gamma of the electromagnetic spectrum, and on this basis to estimate the most important physical parameters such as binary systems with a compact object as one of the ingredients.		• an exam - oral, descriptive, test and other	• Lecture
The student knows and understands the course content.		• an exam - oral, descriptive, test and other	• Lecture

Assignment conditions

Final grade: Oral examination, Condition Assessment - a positive evaluation of the test.

Recommended reading

[1] U. Kolb, *Extreme Environment Astrophysics*, Cambridge, 2010.

[2] S. Rossweg, M. Brueggen, *Introduction to High-Energy Astrophysics*, Cambridge, 2007.

[3] M. S. Longair, *High Energy Astrophysics*, Cambridge, 2011.

Further reading

[1] M. Camenzind, *Compact objects in astrophysics*, Springer, 2007.

[2] W. H. G. Lewin, M. van der Klis, *Compact Stellar X-ray Sources*, Cambridge Uni. Press, 2006.

[3] F. Shu*, Galaktyki, gwiazdy, życie*, Prószyński i S-ka, 2003.

Notes

Modified by dr hab. Piotr Lubiński, prof. UZ (last modification: 28-06-2018 18:03)