Systems of Stars and the structure of the Universe - course description

General information

Course name	Systems of Stars and the structure of the Universe
Course ID	13.7-WF-FizP-SSU- 19
Faculty	Faculty of Physics and Astronomy
Field of study	Physics
Education profile	academic
Level of studies	First-cycle studies leading to Bachelor's degree
Beginning semester	winter term 2022/2023

Course information

Semester	6
ECTS credits to win	5
Available in specialities	Astrofizyka komputerowa
Course type	obligatory
Teaching language	polish
Author of syllabus	• dr hab. Wojciech Lewandowski, prof. UZ

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
Class	30	2	-	-	Credit with grade

Aim of the course

Consolidation and expansion of the basic astrophysical knowledge concerning star systems, star clusters, the structure of the Milky Way Galaxy. the galaxy clusters (including the Local Group), and the large scale structure of the Universe. Expansion of the knowledge about cosmology: the beginning and the future of the Universe, the Big Bang, Cosmic Microwave background, the cosmological constant. Methods of the distance estimation in astrophysics.

Prerequisites

General knowledge about astrophysics and the basics of physics.

Scope

- Star systems: binary stars
- Star clusters: open and globular
- Basic information about the Milky Way.
- Structure of a galaxy
- Classification and evolution of galaxes
- Extragalactic astrophysics
- Methods of astrophysical distances estimation
- The basics of Cosmology

Teaching methods

Classical lecture, numerical exercises

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to use basic knowledge of astrophysics to formulate simple scientific project	• K1A_K01 • K1A_K05	• a written assignment • an exam - oral, descriptive, test and other	• Lecture • Class
Student is able to conduct simple calculations involved in the solving of elementary problems of astrophysics. She is able ti interpret the results of simple astronomical observations, and based upon that he is able to estimate the basic properties of stars.	• K1A_U06	• a written assignment • an exam - oral, descriptive, test and other	• Lecture • Class

Outcome description	Outcome symbols	Methods of verification	The class form
Student has basic knowledge about binary star systems. Student is able to point and describe the differences between open and globular clusters. She can describe stars in both types of clusters, and the clusters distribution in the galaxy. Student understands the method of distance estimation based on the color-brightness diagram for clusters. Studen is able to name and describe tha basic elements of the structure of a galaxy, and point out the differences between them. He is able to describe the method of the estimation of the Galactic rotation curve and interpret its shape in the context of dark matter theory. Student knows the basic classification of galaxies and understands their evolution. She is able to characterize the Local group of galaxies and basic information about galaxy clusters. Student understands the basics of the Big Bang theory and the basic cosmological models. He understands the expansion of the Universe, the Hubble law, the importance of the cosmological constant and Cosmic Microwave background.	• K1A_W01	• a written assignment • an exam - oral, descriptive, test and other	• Lecture • Class

Assignment conditions

Wykład: Egzamin ustny; Warunek zaliczenia - pozytywna ocena z egzaminu.

Ćwiczenia: Poprawne i terminowe wykonanie prac domowych.

Ocena końcowa: 50% ocena z egzaminu + 50% ocena z ćwiczeń.

Przed przystąpieniem do egzaminu student musi uzyskać zaliczenie z ćwiczeń.

Recommended reading

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

[2] M. Kubiak, Gwiazdy i materia międzygwiazdowa, PWN, 1994.

[3] A. Liddle, Wprowadzenie do kosmologii współczesnej, Prószyński i S-ka, 2000.

Further reading

[1] P. Schneider, Extragalactic astronomy and Cosmology, Springer, 20

Notes

Modified by dr Marcin Kośmider (last modification: 04-04-2022 20:51)

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