GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2024-2025

Structure of the Universe (C004221)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)	Dutch	Gent	seminar
			lecture

Lecturers in academic year 2024-2025

van der Wel, Arjen	WE05	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Bachelor of Science in Physics and Astronomy	6	A
Master of Science in Teaching in Science and Technology(main subject Mathematics)	6	A
Master of Science in Mathematics	6	A
Preparatory Course Master of Science in Physics and Astronomy	6	A
Preparatory Course Master of Science in Physics and Astronomy	6	A

Teaching languages

Dutch

Keywords

Structure formation, large-scale structure, galaxy formation

Position of the course

This course unit belongs to the learning pathway "Astronomy" in the Bachelor program Physics and Astronomy.
This course builds on "Stars and Planets" and "Galaxies", and focusses on the structure of the Unverse on the largest scales. The cosmic background radiation contains unique information about the content and shape of the Universe, and also the initial conditions for the emergence of structure in the form of galaxies. The main goal of the course is to provide a quantitative, physical understanding of the processes that explain the observed content of the Universe.

Contents

- Cosmic background radiation
- Structure formation (linear and non-linear)
- Galaxy formation: intergalactic gas, cooling and star formation
- Galaxy evolution
- Black hole formation and AGN
- Galaxy groups and clusters
- Gravitational lensing

Initial competences

Successful completion of the courses “Stars abd Planets” and "Extragalactic Astronomy" or having acquired the necessary competences in another way.

Final competences

Understand the relation between physics (gravity, hydrodynamics) and astronomy (observation of structure and galaxies).

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Study material

Type: Syllabus

Name: Syllabus
Indicative price: Free or paid by faculty
Optional: no
Additional information: available through Ufora

Type: Slides

Name: Slides
Indicative price: Free or paid by faculty
Optional: no
Additional information: available through Ufora

References

- "An Introduction to Modern Astrophysics", B.W. Carroll & D.A. Ostlie, Pearson Education Limited 2014
- "Galaxy Formation and Evolution", H. Mo, F. van den Bosch & S. White, Cambridge University Press

Course content-related study coaching

The material is thoroughly explained during the lectures. The lecturer and teaching assistant(s) are available for additional coaching. Interactive support via Ufora. For longer personal contact with the lecturer and teaching assistant(s): on appointment.

Assessment moments

end-of-term assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment with open-ended questions

Examination methods in case of periodic assessment during the second examination period

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

- Theory: written exam
- Exercises: the students can use the slides and exercises

Calculation of the examination mark

- Theory: 10/20
- Exercises: 10/20