

## Physics of Galaxies (C003005)

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

Credits 6.0      Study time 165 h      Contact hrs 52.5 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	Dutch	lecture	30.0 h
		seminar: coached	22.5 h
		exercises	

Lecturers in academic year 2018-2019

De Rijcke, Sven      WE05      lecturer-in-charge

Offered in the following programmes in 2018-2019

	crdts	offering
<a href="#">Bachelor of Science in Physics and Astronomy</a>	6	A
<a href="#">Master of Science in Mathematics</a>	6	A

Teaching languages

Dutch

Keywords

Galaxies, dynamics, interstellar medium

Position of the course

This course is a sequel to the courses "Introduction to astronomy" and "Extragalactic astronomy". The course focuses on the internal dynamics and the evolution of galaxies. The main goal is to quantitatively understand the fundamental physical processes that determine the observed properties of the various types of galaxies.

Contents

- Dynamics of elliptical galaxies (orbital theory)
  - Dynamics of disc galaxies (spiral theory)
  - Secular evolution (via spirals, interactions, supermassive black holes)
  - Dynamical and kinematical indications of the existence of dark matter
  - active galactic nuclei and accretion discs, jets
  - The interstellar medium (star formation, radiation)

Initial competences

Successful completion of the courses "Introduction to astronomy" and "Extragalactic astronomy" or have acquired the necessary competences in another way.

Final competences

- 1 Understand the relations between "microphysics" (the orbital motions and evolution of individual stars) and "macrophysics" (morphology and evolution of galaxies).
- 2 Be able to explain the properties of galaxies based on models of fundamental physical processes.

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

Lecture, seminar: coached exercises

Extra information on the teaching methods

Part of the time foreseen for the exercises will be available to work on the programming project. This project will be executed in small groups and will be written in the programming language Python. The students are responsible for the composition of their group while the size of the groups is determined by the teacher based on the total number of students. The students are also responsible for making prior agreements on the distribution of tasks within their group. The final assessment and grading is done by the teacher based on the computer program and written report deposited by the students in the Minerva Dropbox. All students of the same group will receive the same score.

#### Learning materials and price

Dutch syllabus, downloadable as .pdf from Minerva. For foreign students, relevant chapters from books can be suggested.

#### References

#### 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 Minerva. For longer personal contact with the lecturer and teaching assistant(s): on appointment.

#### Evaluation methods

end-of-term evaluation

#### Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions, open book examination, oral examination, assignment

#### Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions, open book examination, oral examination, assignment

#### Examination methods in case of permanent evaluation

#### Possibilities of retake in case of permanent evaluation

not applicable

#### Extra information on the examination methods

Theory: written exam  
Exercises: the students can use the syllabus  
Programming project: written presentation

#### Calculation of the examination mark

Theory: 8/20  
Exercises: 7/20  
Programming project: 5/20