UNIVERSITY OF GOTHENBURG

DEPARTMENT OF PHYSICS

FAM145 Exoplanets and the solar system, 7.5 credits

Exoplaneter och solsystemet, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Physics on 2023-05-08 to be valid from 2023-08-28, autumn semester of 2023.

Field of education: Science 100%
Department: Department of Physics

Position in the educational system

Elective course in any of the master programs at the Department of Physics

The course can be part of the following programmes: 1) Physics and learning, Master's Programme (N2FOL), 2) Complex Adaptive Systems, Master's Programme (N2CAS) and 3) Physics, Master's Programme (N2PHY)

Main field of studies	*Specialization*
Physics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

Bachelor's degree in Physics, or equivalent, including courses in mechanics, electromagnetism, and quantum mechanics.

Learning outcomes

Aim

This course provides an introduction to our own solar system and planets orbiting other stars - exoplanets. Thousands of exoplanets have been discovered in recent decades following the development of groundbreaking instruments and facilities, particularly after the launch of several dedicated space telescopes. One of the greatest discoveries is

the exceptional diversity of exoplanets where several new types of planets without equivalents in our own solar system have been discovered. The aim is to make students familiar with this new research field and gain an understanding of our own planet and planetary system in this context.

Knowledge and understanding
Learning outcomes (after completion of the course the student should be able to)

- Describe the structure of the solar system and the basic properties of the planets and moons, including calculations of the planets' orbits.
- Have an understanding of different detection methods of exoplanets, including the possibilities and limitations of each method and basic application to observational data.
- Give an overview of planet formation theories and how these can explain the diversity of exoplanets and the architecture of planetary systems.

Course content
- Introduction to stars.
- Structure and exploration of the solar system.
- Celestial mechanics.
- The road to the discovery of the first exoplanet.
- Detection methods and challenges.
- Telescopes and instrumentation.
- Planet interiors.
- Planet atmospheres.
- Planet categories and the diversity of exoplanets.
- Architecture of exoplanet systems.
- Demographics.
- Introduction to planet formation theories.
- Habitability criteria.

Form of teaching
Lectures, exercises, discussions, project work and assignments.

Language of instruction: English

Assessment
Written exam and compulsory assignments and project work.

If a student who has twice received a failing grade for the same examination component wishes to change examiner ahead of the next examination session, such a request should

be made to the department in writing and should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance). If a student has received a recommendation from the University of Gothenburg for study support for students with disabilities, the examiner may, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, decide to allow the student to sit an adjusted exam or alternative form of assessment. In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years after the course has ceased/been changed. The same applies to internships and professional placements (VFU), although this is restricted to just one additional examination session.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

Course evaluation

The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.