Linnæus University

Dnr: 2014/1612–3.1.2

Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

1FY810 Astrofysik, 7,5 högskolepoäng
1FY810 Astrophysics, 7.5 credits

Main field of study
Physics

Subject Group
Physics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved 2011-12-07
Revised 2014-06-16 by Faculty of Technology. Objectives are revised.
The course syllabus is valid from autumn semester 2014

Prerequisites
Physics 30 credits

Objectives

The purpose of the course is to give the student basic knowledge in the different areas of astronomy and insight in the corresponding physical phenomena, including an orientation in elementary particle physics.
Upon completing the course the student should be able to:

- describe the most important observational methods and coordinate systems in astronomy
- describe the celestial bodies of the solar system, their properties and the mechanisms of their production
- give an account of celestial dynamics and perform basic dynamic calculations
- describe radiation mechanisms and their connection to stellar spectra and perform basic radiation calculations
- describe properties, structure, energy production, evolution and final stages of stars
- describe the atmosphere and activity of the sun
- describe variable stars and their importance for the distance scale of the Universe

- describe the contents and dynamics of the Milky Way galaxy, including the mechanisms of star formation
- describe some results in the search for exoplanets and conditions for life in the Universe
- describe the contents and dynamics of galaxies and galactic clusters as well as active galactic nuclei
- describe the largest structures and history of the observable Universe
- describe the subnuclear constituents of nature and their interaction
- describe experimental activities in particle physics.

Content
The course content is:

- The sky of stars and coordinate systems. Observational techniques. Celestical mechanics. The solar system. Extraterrestrial systems and astro biology. The sun. Radiation mechanism and stars. Structure and development of stars. The interstellar medium. Formation of stars and planets. The Milky Way. Galaxies and galactic clusters. Big Bang and the development of the universe.
- The standard model in particle physics and experimental methods used in particle and astroparticle physics, detectors used in both fields.
- Didactics: orientation about the historical development of the subject.

Type of Instruction
The teaching consist of lectures and laboratory work. The laboratory work is compulsory.

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

The examination may be given in writings and/or orally and consists of theoretical questions or problems to solve. The type of assessment used in the course will be decided on at the beginning of the course. The student has to write reports on laboratory work carried out.
Students´ who do not pass the regular examination are given the opportunity to do a resit examination shortly after the regular examination.
On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation
A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material
Required reading
Karttunen, H. et al, Fundamental Astronomy, 5th ed., Springer-Verlag Berlin and Heidelberg GmbH & Co. K, ISBN: 9783540341437
Copied material supplied by the department