

ASTM14, Astronomy: Stellar Structure and Evolution, 7.5 credits

Astronomi: Stjärnornas struktur och utveckling, 7,5 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-01-31 to be valid from 2007-07-01, autumn semester 2007.

General Information

The course is a compulsory course for second-cycle studies for a Degree of Master of Science (120 credits) in astrophysics.

Language of instruction: English and Swedish

If needed, the course is given in English in its entirety.

Main field of studies

Physics

Astrophysics

Depth of study relative to the degree requirements

A1N, Second cycle, has only first-cycle course/s as entry requirements

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Learning outcomes

The aims of the course are that, upon completion of the course, the student should have acquired the following knowledge and skills: The student should in detail be able to

- identify and explain the different stages of the stars' development in a Hertzsprung-Russell diagram
- derive the basic equations concerning the structure of the stars and their energy transport
- describe nuclear reactions that take place in stars
- describe how the evolution and final states of stars depend on their initial masses

have awareness of

- how one utilises simple stellar models
- current research regarding the structure and evolution of stars.

Using the knowledge acquired, the student should be able to independently take on a complex problem, break it down into its essential components, implement a solution and reflect on the results.

Course content

The course contains the following parts: An overview of the different phases in the evolution of stars. The equations of stellar structure. The virial theorem. Energy transport via radiation and convection. Thermonuclear reactions in stars. Simple stellar models. Homologous stellar models. Star formation. Evolution of high-mass and low-mass stars.

Course design

The teaching consists of lectures, laboratory sessions, group work and project work. Participation in laboratory sessions, group work and project work and other connected teaching is compulsory.

Assessment

The examination consists of laboratory reports and project work and a written and oral test at the end of the course. Students who do not pass the regular exam are offered a re-examination shortly following the regular exam.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.

To pass the entire course, approved examination, approved laboratory reports, a passed project report and participation in all compulsory parts are required. The final grade is determined by the results in the different parts of the examination.

Entry requirements

The prerequisites required for admission to the course are: English B and knowledge equivalent to FYS31 (Physics 3, Modern physics), 30 credits.

Further information

The course may not be credited towards a degree together with AST315 The Physics of Stars, 10p, or AST010 The Structure and Development of Stars, 5p.

Subcourses in ASTM14, Astronomy: Stellar Structure and Evolution

Applies from H13

- 1301 Project, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
- 1302 Examination, 6,0 hp
Grading scale: Fail, Pass, Pass with distinction

Applies from H07

- 0701 Stellar Structure and Evolution, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction