Department of Astronomy

Stockholm University

Syllabus

for course at advanced level

The Physics of the Interstellar Medium
Interstellära mediets fysik

7.5 Higher Education Credits
7.5 ECTS credits

Course code:	AS7001
Valid from:	Autumn 2019
Date of approval:	2006-06-08
Changed:	2015-11-16
Department	Department of Astronomy
Main field:	Astronomy
Specialisation:	A1N - Second cycle, has only first-cycle course/s as entry requirements

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University 2006-06-08.

Prerequisites and special admittance requirements

To enter this course knowledge corresponding to a Bachelor's degree in physics, or similar, is required. Also required is knowledge equivalent to Swedish upper secondary school course English B, or equivalent to one of the following tests; Cambridge CPE and CAE: Pass, IELTS: 6.0 (with no part of the test below 5.0), TOEFL (paper based): 550 (with minimum grade 4 on the written test part), TOEFL (computer based): 213, TOEFL (internet based): 79.

Course structure

Examination code	Name	Higher Education Credits
TEN1	Exam	7.5

Course content

The course covers the physical processes that dominate in the interstellar medium. In particular, it covers photoionization, recombination, line emission, continuum emission, dust and shocks. Applications are made for planetary nebulae, supernova remnants, interstellar clouds, stellar winds and active galaxies.

Learning outcomes

It is expected that the student after taking the course will be able to: - know and understand the physical processes that dominate in the interstellar medium and other similar gases - to estimate temperature and ionization/excitation conditions in such gases and the temperature in dust that may exist - describe which components that exist in the interstellar medium, their properties, and which of them that are in rough pressure equilibrium and which of them are not - show understanding for the types of shocks that may exist in the interstellar medium - show ability to independently acquire knowledge about the physical processes that are treated in the course, as well as in an independent way communicate this knowledge to other students and the teachers - interpret spectral information from the emission and absorption of radiation which is produced in the interstellar medium and other similar gases.

Education

The education consists of lectures, seminars and written reports in conjunction with these, and hand-in exercises.
Participation at seminars and reports is compulsory. An examiner may rule that a student is not obliged to

participate in certain compulsory education if there are special grounds for this after consultation with the relevant teacher

Forms of examination

a. Examination for the course is in the following manner: measurement of knowledge takes place through:: Written or oral examination

b. Grading is carried out according to a 7-point scale related to learning objectives: A = Excellent B = Very Good C = Good D = Satisfactory E = Sufficient Fx = Fail F = Fail c. Grading criteria for the course will be distributed at the start of the course. d. A minimum grade of E is required to pass the course, together with: participation at other students oral seminars and reports. e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term “examination” here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board. The course has at least two occasions with exams the year the course is given. Years when not given, there is at least one exam occasion. f. When graded Fx, the student is given the possibility to make a complementary task to raise the grade to E. The examiner decides which tasks are needed to be done and the criteria to pass the complimentary task. The complimentary task must be completed before next exam occasion.

Interim

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

Limitations

The course may not be included in a degree together with the courses ”Interstellära mediets fysik, gk, 5p” (AI1270), or the equivalents.

Misc

The course is a component of the Master's programme in Astronomy, but can also be taken as an individual course.

Required reading

Course literature is decided by the departmental board and is described in an appendix to the syllabus.