Syllabus
for course at advanced level
Cosmology and Particleastrophysics
Kosmologi och astropartikelfysik

7.5 Higher Education
Credits
7.5 ECTS credits

Course code: FK7007
Valid from: Autumn 2007
Date of approval: 2006-09-27
Department: Department of Physics
Subject: Physics
Specialisation: A1N - Second cycle, has only first-cycle course/s as entry requirements

Prerequisites and special admittance requirements
Quantum mechanics II, 7.5 HECs. Also required is knowledge equivalent to Swedish upper secondary course English B.

Course structure
Examination code | Name                                      | Higher Education Credits
---              | ---                                       | ---
1100            | Cosmology and Astroparticle Physics        | 7.5

Course content
Concepts and new results in cosmology and particle astrophysics are treated in the course, e.g. the geometry of the Universe, candidates for the dark matter and dark energi. The equations governing the expansion history of the Universe, from the Big Bang untill now, are derived from Einstein's general relativity. The leading techniques to study the properties of the Universe are treated, e.g. the cosmic microwave background, gravitational lensing and the use of Type Ia supernovae.

Learning outcomes
After having passed the course the student is expected to:
* understand and be able to describe the basics of general relativity
* understand the basics of the cosmological standard model
* master the basic equations describing the expansion of the universe
* be able to describe the techniques used to measure the content of the universe

Education
The education consists of lectures, hand-ins, presentations and excercises. Participation in the hand-ins and presentations 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. The student's knowledge will be tested by a written and/or oral exam.
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.

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.

**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 as a part of a degree together with the course FY4060.

**Misc**
The course is given as an individual course and is suitable for PhD students in physics or astronomy.

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