Universidad Zaragoza

Academic Year/course: 2021/22

26950 - High Energy Physics

Syllabus Information

Academic Year: 2021/22
Subject: 26950 - Física de altas energías
Faculty / School: 100 - Facultad de Ciencias
Degree: 447 - Degree in Physics
ECTS: 5.0
Year: 4 and 3
Semester: Second semester
Subject Type: Optional
Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It favors the understanding of the physics of elementary particles from a theoretical, phenomenological and experimental perspective. A wide range of teaching and learning tasks are implemented, such as theory sessions, sessions dedicated to the discussion and resolution of problems and assignments to be done individually or in groups.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via telegram. These include a repository of the lecture notes used in class, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

4.2. Learning tasks

This is a 6 ECTS course organized as follows:

- Lectures (4.5 ECTS: 45 hours). Lecture notes and a set of problems will be available for the students. At the end of each topic, some of the problems will be solved in class by the teacher and the rest will be done individually. The lecturer will also assign problems to groups of 4-5 students, which they will submit to the teacher.
- Assignments (1.5 ECTS: 15 hours). Different assignments during the course to be done by each student or by small groups.

4.3. Syllabus

The course will address the following topics:

Section 1. Phenomenology of high energy physics

Topic 1. Introduction to particle physics

Topic 2. Relativistic kinematics

Topic 3. Interactions of particles. Cross sections and decay widths.

Section 2. Experimental Methods

Topic 4. Detection of particles

Topic 5. Particle accelerators and detectors.

Section 3. Theory of high energy physics

Topic 6. Classical Field Theory

Topic 7. Free Quantum Field Theory

Topic 8. Interactions. Perturbation theory. Feynman diagrams

4.4. Course planning and calendar

Provisional course planning:

- Weeks 1-2: topic 1
- Weeks 3-4: topic 2
- Weeks 4-5: topic 3
- Weeks 6-7: topic 4
- Weeks 7-8: topic 5
- Week 9-10: topic 6
- Week 11-12: topic 7
- Week 13-14: topic 8

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the "Facultad de Ciencias" website.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=26950