

Physics beyond the standard model

Lecturers

Thomas HAMBYE (Coordinator) and Michel TYTGAT

Course mnemonic

PHYS-F469

ECTS credits

5 credits

Language(s) of instruction

English

Course period

First term

Campus

Plaine

Course content

Standard Model: Brief reminder and Problems

Anomalies

Aspects of Effective Field Theory

Aspects of Grand Unified Theories

Neutrinos and Dark Matter

Aspects of Supersymmetry

Objectives (and/or specific learning outcomes)

The general objective of this course is to build the necessary basis to study and develop models beyond the Standard Model of Particle Physics. The course will include both theoretical and experimental aspects.

Pre-requisites and co-requisites

Co-requisites courses

PHYS-F410 | Quantum field theory I | 5 crédits

Required knowledge and skills

It is recommended to have followed lectures on group theory.

Teaching method and learning activities

tablet lectures and slides

Supervised exercises

Personal project

Contribution to the teaching profile

Constitute, develop and entertain aspects of fundamental physics.

Act as an autonomous scientific expert in solving problems

Communicate in an appropriate language in a scientific context and to a scientific public

References, bibliography and recommended reading

An Introduction To Quantum Field Theory de Michael E. Peskin et Daniel V. Schroeder

Quantum Field Theory and the Standard Model de Matthew D. Schwartz

Gauge Theory of Elementary Particle Physics de Ta-Pei Cheng et Ling-Fong Li

extra bibliography will be provided during the course

Other information

Place(s) of teaching

Plaine

Contact(s)

michel.tytgat AT ulb.be

Evaluation method(s)

Other

Evaluation method(s) (additional information)

Oral exam on the lectures and exercises

Personal project: in depth study of one aspect going beyond the material presented during the lectures: oral presentation at the exam

Determination of the mark (including the weighting of partial marks)

Oral exam on the lectures and exercises (50%)

Personal project (50%): in depth study of one aspect going beyond the material presented during the lectures: abstract submitted before the exam and oral presentation at the exam

Main language(s) of evaluation

English

Other language(s) of evaluation, if applicable

French

Programmes

Programmes proposing this course at the faculty of Sciences

MA-PHYS | **Master in Physics** | finalité Research/unit 2 and finalité Teaching/unit 2

