Summary
The goal of the course is to introduce relativistic quantum field theory as the conceptual and mathematical framework describing fundamental interactions.

Content
1. Introduction
Fundamental motivations for quantum field theory, Natural units of measure, Overview of the Standard Model of particle physics.
2. Classical Field Theory Lagrangian and Hamiltonian formulation.
4. Noether theorem conserved currents, conserved charges, the conserved charges of the Poincaré group and their interpretation.

Learning Prerequisites
Required courses
Classical Electrodynamics, Quantum Mechanics I and II, Analytical Mechanics

Recommended courses
Mathematical Physics warmly recommended

Learning Outcomes
By the end of the course, the student must be able to:
• Expound the theory and its phenomenological consequences
• Formalize and solve the problems

Transversal skills
• Use a work methodology appropriate to the task.

Teaching methods
Ex cathedra and exercises in class

Assessment methods
Exam: oral, consisting of one theoretical question and one exercise, picked randomly and for which the candidate is allowed a 30 minute preparation

Resources
Bibliography
• "Relativistic quantum mechanics / James D. Bjorken, Sidney D. Drell". Année:1964

Ressources en bibliothèque
• An Introduction to Quantum Field Theory / Peskin
• The Quantum Theory of Fields / Weinberg
• Quantum Field Theory / Itzykson
• Relativistic Quantum Mechanics / Drell
• A Modern Introduction to Quantum Field Theory / Maggiore
• Théorie quantique des champs / Derendinger

Websites
• https://lptp.epfl.ch/files/content/sites/lptp/files/Files/LectureNotes/Quantum%20Field%20Theory

Moodle Link
• https://moodle.epfl.ch/course/view.php?id=14811

Prerequisite for
Recommended for Theoretical Physics and for Particle Physics