PHYS203 – Relativistic Quantum Mechanics and Field Theory

Pensum / Syllabus

- Introduction: notation, Klein-Gordon equation, Dirac equation
- Free-particle solutions of the Dirac equation
- The Dirac equation with an electromagnetic field
- The Dirac equation and Lorentz transformations
- Discrete symmetries of the Dirac equation
- Lagrangian field theory
- The Klein-Gordon field
- The Dirac field
- The photon field

The required knowledge for the exam will be the content of the lectures and the problem sets.

Literature

Main textbooks

- Ohlsson, Relativistic Quantum Physics
- Mandl and Shaw, Quantum Field Theory
- Bjorken and Drell, Relativistic Quantum Mechanics (out of print but available in the library; some chapters will also be available in the Literature Kiosk)

Supplementary books

- Schwabl, Advanced Quantum Mechanics
- Greiner, Relativistic Quantum Mechanics
- Peskin and Schroeder, An Introduction to Quantum Field Theory
- Weinberg, The Quantum Theory of Fields, Vol. 1
- Zee, Quantum Field Theory in a Nutshell