

Modules:

ECThPhysics **Elective Courses Theoretical Physics**
 physics70c **Elective Advanced Lectures: Theoretical Physics**

Course:**Quantum Field Theory (T)**

Course No.: physics755

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+2	7	ST

Requirements for Participation:**Preparation:**

Advanced quantum theory (physics606)

Form of Testing and Examination:

Requirements for the examination (written): successful work with the exercises

Length of Course:

1 semester

Aims of the Course:

Understanding quantum field theoretical methods, ability to compute processes in quantum electrodynamics (QED) and many particle systems

Contents of the Course:

Classical field theory
 Quantization of free fields
 Path integral formalism
 Perturbation theory
 Methods of regularization: Pauli-Villars, dimensional
 Renormalizability
 Computation of Feynman diagrams
 Transition amplitudes in QED
 Applications in many particle systems

Recommended Literature:

N. N. Bogoliubov, D.V. Shirkov; Introduction to the theory of quantized fields (J. Wiley & Sons 1959)
 M. Kaku, Quantum Field Theory (Oxford University Press 1993)
 M. E. Peskin, D.V. Schroeder; An Introduction to Quantum Field Theory (Harper Collins Publ. 1995)
 L. H. Ryder; Quantum Field Theory (Cambridge University Press 1996)
 S. Weinberg; The Quantum Theory of Fields (Cambridge University Press 1995)