

# Quantum Field Theory (T) - physics755

Degree - M.Sc. in Physics (PO von 2014)

<i>Module</i>	<b>Elective Courses Theoretical Physics</b>
<i>Module No.</i>	ECThPhysics

<i>Course</i>	<b>Quantum Field Theory (T)</b>
<i>Course No.</i>	physics755

<b>Category</b>	<b>Type</b>	<b>Language</b>	<b>Teaching hours</b>	<b>CP</b>	<b>Semester</b>
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)

