Quantum Chromodynamics (T) - physics758

Course	**Quantum Chromodynamics (T)**
Course No.	physics758

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

Requirements for Participation:

Preparation:

Advanced quantum theory (physics606)

Quantum Field Theory (physics755)

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 basic properties of Quantum Chromodynamics, ability to compute

strong interaction processes

Contents of the Course:

Quantum Chromodynamics as a Quantum Field Theory

Perturbative Quantum Chromodynamics

Topological objects: instantons etc.

Large N expansion

Lattice Quantum Chromodynamics

Effective Field Theories of Quantum Chromodynamics

Flavor physics (light and heavy quarks)

Recommended Literature:

S. Weinberg; The Quantum Theory of Fields (Cambridge University Press 1995)

M.E. Peskin, D.V. Schroeder; An Introduction to Quantum Field Theory (Westview Press 1995)

F.J. Yndurain; The Theory of Quark and Gluon Interactions (Springer 2006)

J.F. Donoghue et al.; Dynamics of the Standard Model (Cambridge University Press 1994)

E. Leader and E. Predazzi; An Introduction to Gauge Theories and Modern Particle Physics (Cambridge University Press 1996)

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