# Modules:

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

# Course: Advanced Quantum Field Theory (T)

**Course No.:** physics7501

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

**Requirements for Participation:**

**Preparation:**
3-year theoretical physics course with extended interest in theoretical physics and mathematics

**Form of Testing and Examination:**
Requirements for the module examination (written examination): successful work with exercises

**Length of Course:**
1 semester

**Aims of the Course:**
Introduction to modern methods and developments in Theoretical Physics in regard to current research

**Contents of the Course:**
Selected Topics in Modern Theoretical Physics for example:
Anomalies
Solitons and Instantons
Quantum Fluids
Bosonization
Renormalization Group
Bethe Ansatz
Elementary Supersymmetry
Gauge Theories and Differential Forms
Applications of Group Theory

**Recommended Literature:**
M. Nakahara; Geometry, Topology and Physics (Institute of Physics Publishing, London 2nd Ed. 2003)
R. Rajaraman; Solitons and Instantons, An Introduction to Solitons and Instantons in Quantum Field Theory (North Holland Personal Library, Amsterdam 3rd reprint 2003)
A. M. Tsvelik; Quantum Field Theory in Condensed Matter Physics (Cambridge University Press 2nd Ed. 2003)
A. Zee; Quantum Field Theory in a Nutshell (Princeton University Press 2003)