### Module:

### **Base Module Theoretical Physics**

Module No.: physics605

## Course:



# **Advanced Theoretical Physics**

Course No.: physics607

Category	Туре	Language	Teaching hours	СР	Semester
Elective	Lecture with exercises	English	3+2	7	WT

Requirements:

#### **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)