Modules:

physics70a **Elective Advanced Lectures: Experimental Physics**

physics70b **Elective Advanced Lectures: Applied Physics**

Course: Modern Spectroscopy (E/A)

Course No.: physics741

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	2+1	4	WT/ST

Requirements for Participation:

Preparation:
Fundamentals of Optics, Fundamentals of Quantum Mechanics

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

Length of Course:
1 semester

Aims of the Course:
The aim of the course is to introduce the students to both fundamental and advanced concepts of spectroscopy and enable them to practically apply their knowledge.

Contents of the Course:
Spectroscopy phenomena - time and frequency domain;
high resolution spectroscopy;
pulsed spectroscopy; frequency combs;
coherent spectroscopy;
nonlinear spectroscopy: Saturation, Raman spectroscopy, Ramsey spectroscopy.
Applications of spectroscopic methods (e.g. Single molecule spectroscopy; spectroscopy at interfaces & surfaces, spectroscopy of cold atoms; atomic clocks; atom interferometry)

Recommended Literature:
W. Demtröder; Laser spectroscopy (Springer 2002)
S. Svanberg; Atomic and molecular spectroscopy basic aspects and practical applications (Springer 2001)
A. Corney; Atomic and laser spectroscopy (Clarendon Press 1988)
N. B. Colthup, L. H. Daly, S. E. Wiberley; Introduction to infrared and Raman spectroscopy (Academic Press 1990)
P. Hannaford; Femtosecond laser spectroscopy (Springer New York 2005)
C. Rulliere; Femtosecond laser pulses: principles and experiments (Springer Berlin 1998)