

Module: Specialization II

Module No.: physics630

Course:  universität **bonn****Laser Spectroscopy**

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Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+1	6	ST

Requirements:**Preparation:****Form of Testing and Examination:**

Requirements for the examination (written): successful work with the exercises

Length of Course:

1 semester

Aims of the Course:

Make the students understand the principles of spectroscopy and enable them to practically apply their knowledge in research and development.

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.
 Single molecule spectroscopy; spectroscopy at interfaces & surfaces
 Advanced optical imaging;
 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. Hannafor; Femtosecond laser spectroscopy (Springer New York 2005)
 C. Rulliere; Femtosecond laser pulses: principles and experiments (Springer Berlin 1998)