

Title Multifunctional Materials (Materiały wielofunkcyjne)	Code 1010402221010430676
Field TECHNICAL PHYSICS	Year / Semester 1 / 2
Specjalty -	Course core
Hours Lectures: 1 Classes: 1 Laboratory: - Projects / seminars: -	Number of credits 4
	Language polish

Lecturer:

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Status of the course in the study program:

Core course of the study for Technical Physics, Faculty of Technical Physics.

Assumptions and objectives of the course:

Students should obtain knowledge of the new materials, technologies and perspective applications in live science and medicine; understanding of the physical phenomena on the molecular and atomic level

Contents of the course (course description):

Processes at the flat and curved interfaces; capillary forces, nucleation, wetting; adsorption at solid surfaces from gas phase; concentration of amphoteric molecules at the interfaces; application of the surface active molecules in industry; molecular layers as an active layers in electronic devices; Langmuir-Blodgett and Langmuir-Schefer technique; self-assembly monolayers,; application nanomaterials in technology and medicine; photosensitive materials and optical markers; phototherapy; triplet states and photodynamic potential; artificial bio-membrane; quantum dots in medicine

Introductory courses and the required pre-knowledge:

Knowledge of experimental physics from the basic university course of physics, introduction to nanoscience, basic university course of mathematics

Courses form and teaching methods:

Lectures with use of multimedia and supported by experimental demonstrations

Form and terms of complete the course - requirements and assessment methods:

Written and oral examination

Basic Bibliography:

1. H-J. Butt, K. Graf, M. Kappl, Physics and chemistry of interfaces, Wiley-VCH, Weinheim, 2003
2. A.W. Adamson i A.P. Gast, Physical chemistry of surface, Willey, NY, 1997.
3. D. Holiday, R. Resnick, J. Walker , ?Fundamentals of Physics?, vol. 1-5, Wiley&Sons Inc., NYC, 2001.

4. H. D. Young, R. A. Freedman, A. L. Ford, ?University Physics?, Person International Edition, San Francisco, 2008.
5. C. Kittel, - ?Introduction to solid state physics?, Willey, NYC, 2005.
6. D. J. Griffiths, ?Introduction to Electrodynamics?, Prentice-Hall, New Jersey, 1999.

Additional Bibliography:

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