

Title Elective course II (Wykł. monograficzny II)	Code 1010401271010410721
Field TECHNICAL PHYSICS	Year / Semester 4 / 7
Specjalty -	Course elective
Hours Lectures: 2 Classes: - Laboratory: - Projects / seminars: -	Number of credits 5
	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:

to acquaint students with the achievements in relatively new interdisciplinary investigations discipline, which is an interface of physics, electronics, biology and chemistry; analysis of physical molecular processes occurred in living organisms; modeling of such a processes; to show the possibility of application biomolecular materials in microelectronics and physical sensors; short course from Biophysics to molecular machine construction

Contents of the course (course description):

Overview of bioelectronics. Life - main biomolecular blocks. Molecules and photochemical reactions in biology. Structure and function of highly organized molecular systems and their models. Macromolecules, biomolecules and supramolecules. Molecular electronics. Bio-sensors. Self-assembled monolayers. Self-organized molecular systems. Surface plasmon resonance. Bio-molecular machine constructions. Bio-molecular human sensors.

Introductory courses and the required pre-knowledge:

Basic knowledge of classical physics and molecular physics

Courses form and teaching methods:

lectures supported by multimedia presentation using PowerPoint and computer simulations of phenomena

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

oral examination

Basic Bibliography:

1. Molecular Bioelectronics, C. Nicolini, World Scientific Singapore, New Jersey, London, Hong Kong, 1996
2. Bioelectronics, I. Willner and E. Katz Ed., Wiley-Vch Verlag GmbH & Co, 2005
3. 3. Molecular Physics and Elements of Quantum Chemistry, Herman Haken and Hans C. Wolf, Springer-Verlag Berlin Heidelberg 1995

4. Molecular electronics - Biosensors and Biocomputers, Felix T. Hong Ed., Plenum Press New York and London 1989

Additional Bibliography:

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