

Module name	Physics with elements of biophysics
Module code	B-B.017Eng
ISCED code	0511: Biology (<i>zostaje bez zmiany</i>)
Study cycle	I ^o
Semester	winter
Responsible for this module	Kamila Kupisz Department of Plant Physiology and Biophysocs email: kamila.kupisz@poczta.umcs.lublin.pl
Language of instruction	English
Website	
Prerequisites	General knowledge in physics and biology at high school level
ECTS	5
ECTS points hour equivalents	Contact hours (work with an academic teacher) – 60h - lectures: ...20 - labs: ...40 Non-contact hours (students' own work) – 80 h - preparation for the exam: 25 h - preparation for labs: 20 h.. - preparation of reports from laboratory exercises: 20 h - literature study: 15 h Total number of ECTS points for the module - 5
Learning outcomes verification methods	Final exam Laboratory classes and reports
Course full description	<ul style="list-style-type: none"> • SI base units, vectors, mathematical operation on vector quantities, analysis of measurement errors, • Lipid membrane - surface tension and method of its measurement, surfactants, monolayers, bilayers, black lipid membrane (BLM) • Biological membranes; cell structure, composition, physicochemical properties • Transport through membranes, ion channels • Membrane potential; equilibrium (Nernst's) potential, resting potential, action potential • Electrical conductivity of living organisms • Radiation, light intensity, radiant power density, photon flux density • Light absorption through the medium • Biophysics of visual processes, an eye
Bibliography	Recommended literature: <ul style="list-style-type: none"> • Physics in Biology and Medicine. Paul Davidovits, 2008 • Biophysics. A Physiological Approach. Patrick F. Dillon, 2012 • Molecular Driving Forces. Ken A. Dill, Sarina Bromberg, 2011 • Cell Physiology Source Book : Essentials of Membrane Biophysics. Nicholas Sperelakis Nick Sperelakis, 2011
Learning outcomes	KNOWLEDGE - Student recognises basic processes occurring in living organisms at the molecular, cellular, and organism level

	<p>- Knows the basic mathematical concepts, accounting and statistical methods and their applications in the interpretation of biological phenomena and processes</p> <p>SKILLS</p> <ul style="list-style-type: none"> -Uses basic laboratory and field research tools and techniques applied in biology sciences - Applies mathematic and statistical methods for description of phenomena, analysis of the experiment, and elaboration of results -Makes written reports of experiments and writes, in English as well, short essays on assigned topics and formulates correct conclusions from experiments and observations <p>SOCIAL COMPETENCES</p> <ul style="list-style-type: none"> - Adopts an active attitude towards acquisition, extension, and updating biological knowledge - Analyses assigned tasks in terms of correct and efficient implementation thereof by determining the sequence of activities and specifying principles of cooperation in the team
Practice	-
Teaching methods	lecture, demonstration, measurement