

Module name	Physics with elements of biophysics
Module code	
ISCED code	0511: Biology
Study cycle	I ^o
Semester	winter
Responsible for this module	Imię i Nazwisko: dr Kamila Kupisz, dr hab. Maria Stolarz Department of Plant Physiology and Biophysics email: kamila.kupisz@poczta.umcs.lublin.pl maria.stolarz@poczta.umcs.lublin.pl
Language of instruction	English
Website	
Prerequisites	General knowledge in physics and biology at high school level
ECTS	5 ECTS points
ECTS points hour equivalents	<p>Contact hours (work with an academic teacher) – 60 - lectures: 20 - labs: 40</p> <p>Non-contact hours (students' own work) – 80 - preparation for the exam: 25 hours - preparation for labs: 20 hours - preparation of reports from laboratory exercises: 20 hours - literature study: 15 hours</p> <p>Total number of ECTS points for the module - 5</p>
Learning outcomes verification methods	W1,W2 - Final exam U1-U3, K1-K2 - Laboratory classes
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	<ul style="list-style-type: none"> • Physics in Biology and Medicine. Paul Davidovits, 2008 • Biophysics. A Physiological Approach. Patrick F.

	<p>Dillon, 2012</p> <ul style="list-style-type: none"> • Molecular Driving Forces. Ken A. Dill, Sarina Bromberg, 2011 • Cell Physiology Source Book : Essentials of Membrane Biophysics. Nicholas Sperelakis Nick Sperelakis, 2011
Learning outcomes	<p>KNOWLEDGE</p> <p>W1: Student recognises basic processes occurring in living organisms at the molecular, cellular, and organism level K_W01, K_W02</p> <p>W2: Knows the basic mathematical concepts, accounting and statistical methods and their applications in the interpretation of biological phenomena and processes K_W01, K_W02, K_W07</p> <p>SKILLS</p> <p>U1: Uses basic laboratory and field research tools and techniques applied in biology sciences K_U01, K_U02, K_U03</p> <p>U2: Applies mathematic and statistical methods for description of phenomena, analysis of the experiment, and elaboration of results K_U02, K_U03</p> <p>U3: Makes written reports of experiments and writes, in English as well, short essays on assigned topics and formulates correct conclusions from experiments and observations K_U04</p> <p>SOCIAL COMPETENCES</p> <p>K1: Adopts an active attitude towards acquisition, extension, and updating biological knowledge K_K02</p> <p>K2: 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 K_K02</p>
Practice	-
Teaching methods	lecture, presentation, experiment