



Pomeranian Medical University in Szczecin

SYLLABUS of the MODULE (SUBJECT) General Information

Module title: Biophysics 2025/2026	
Module type	Obligatory
Faculty PMU	Faculty of Medicine and Dentistry
Major	Dentistry
Level of study	long-cycle (S2J)
Mode of study	full-time studies
Year of studies, semester	Year 1, semester I
ECTS credits (incl. semester breakdown)	3
Type/s of training	seminars (2h) seminars e-learning (12h) practical classes (12h)
Form of assessment*	<input checked="" type="checkbox"/> graded assessment: <ul style="list-style-type: none"> <input type="checkbox"/> descriptive <input checked="" type="checkbox"/> test <input type="checkbox"/> practical <input type="checkbox"/> oral <input type="checkbox"/> non-graded assessment <input type="checkbox"/> final examination <ul style="list-style-type: none"> <input type="checkbox"/> descriptive <input type="checkbox"/> test <input type="checkbox"/> practical <input type="checkbox"/> oral
Head of the Department/ Clinic, Unit	Dr n. med. Karolina Jezierska/ karolina.jezierska@pum.edu.pl /792 52 76 52
Tutor responsible for the module	Dr hab. n. med. Wojciech Podraza, wojciech.podraza@pum.edu.pl
Department's website	https://www.pum.edu.pl/wydzialy/wydzial-lekarsko-biotechnologiczny/zaklad-fizyki-medycznej/information-for-students
Language	English

* replace into where applicable

Detailed information

Module objectives		Lectures and exercises are designed to introduce students to the basic issues of physics and biophysics regarding the physical foundations of physiological processes and to familiarize themselves with the physical phenomena underlying modern medical diagnostics and therapy in medicine.
Prerequisite /essential requirements	Knowledge	physics and mathematics at the matriculation level
	Skills	is able to define and estimate the measurement error, graphically present the results of measurements, know the basic mathematical functions, know the operations on exponents and logarithms
	Competences	openness to knowledge, self-study habit, willingness to cooperate in a group, teamwork skills

Description of the learning outcomes for the subject /module

No. of learning outcome	Student, who has passed the (subject) knows /is able to /can:	SYMBOL (referring the standards)	Method of verification of learning outcomes*
W01	Explains the rules of statics and biomechanics regarding human body	B. W7	K
W02	Describes imaging techniques of tissues and organs and principles of appropriate diagnostic equipment	B. W8	K
W03	Describes principles of operation of ultrasonic equipment	B. W9	K
W04	Describes principles of photometry and optical fibers and application of light sources in dentistry	B. W10	K
W05	Describes principles of operation of lasers in dentistry	B. W11	K
U01	Interprets physical phenomena occurring in stomatognathic system	B. U1	SL
U02	Uses physical processes in dental practice	B. U2	SL
U03	Assess harmful doses of ionising radiation and apply the principles of radiological protection	B. U3	SL
U04	Uses simple measurement apparatus and assess the precision of conducted measurements	B.U6	SL
K01	Notices and recognizes own limitations, make self-assessment of educational deficits and needs	K.5	SL, PM
K02	Draws conclusions from own measurements or observations	K.8	SL, PM

Table presenting LEARNING OUTCOMES in relation to the form of classes

No. of	Learning outcomes	Type of training
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learning outcome		Lecture	Seminar	Practical classes	Clinical classes	Simulations	E-learning	Other...
W01	B. W7						x	
W02	B. W8						x	
W03	B. W9						x	
W04	B. W10						x	
W05	B. W11		x				x	
U01	B. U2			x				
U02	B. U3			x				
K01	K.5			x				
K02	K.8			x				

Table presenting TEACHING PROGRAMME			
No. of a teaching programme	Teaching programme	No. of hours	References to learning outcomes
Winter semester			
Seminars			
TK01	Dental equipment.	2	W05
Seminars e-learning			
TK02	Ultrasounds in medicine.	2	W03
TK03	Lasers in medicine.	2	W05
TK04	Medical diagnostics I	2	W02
TK05	Photometry and optical fibres.	2	W04
TK06	Biomechanics.	2	W01
TK07	Medical diagnostics II	2	W02
Practical classes			
TK08	Ultrasounds.	2	U02, K02
TK09	3D printing.	2	U02, K02
TK10	Spectroscopy.	2	U04, K02
TK19	Ionizing radiation and radiation protection.	2	U03, K02
TK12	Microscopes	2	U04, K02
TK13	Physical phenomena occurring in stomatognathic system	2	K01, K02

Booklist
Obligatory literature:
Physics of the Body / John R. Cameron, James G. Skofronick, Roderick M. Grant ; 2 nd Ed. Medical Physics Publishing 2017 ISBN 978193052494
Supplementary literature:
Physics: Principles with Applications / Douglas C. Giancoli PEARSON EDUCATION; 7 th Edition, 2016 ISBN 9781292057125
Modified MasteringPhysics for Physics: Principles with Applications 7 th Edition

Student's workload	
Form of student's activity (in-class participation; activeness, produce a report, etc.)	Student's workload [h]

	Tutor
Contact hours with the tutor	26
Time spent on preparation to seminars/ practical classes	10
Time spent on reading recommended literature	10
Time spent on writing report/making project	10
Time spent on preparing to colloquium	20
Time spent on preparing to exam	
Other	
Student's workload in total	80
ECTS credits for the subject (in total)	3
Remarks	

* Selected examples of methods of assessment:

EP – written examination

EU – oral examination

ET – test examination

EPR – practical examination

K – colloquium

R – report

S – practical skills assessment

RZC – practical classes report, incl. discussion on results

O – student's active participation and attitude assessment

SL – lab report

SP – case study

PS - assessment of student's ability to work independently

W – entry test

PM – multimedial presentation

other...