COURSE DESCRIPTION CHART

Discipline code	12.6-3LEK-F-BiM	
Name of discipline	Polish	**Bioelektryczność i biomagnetyzm w diagnostyce**
	English	**Bioelectricity and biomagnetism in diagnosis**

1. POSITION OF DISCIPLINE IN THE STUDY SYSTEM

1.1. Study speciality	medicine
1.2. Form of study	full-time
1.3. Level of study	uniform Master's study
1.4. Profile of study	practical
1.5. Specialization	lack
1.6. Unit conducting the discipline	Faculty of Medicine and Health Sciences
1.7. Person preparing course description chart	prof. dr hab. Janusz Braziewicz
1.8. Person responsible for the discipline	prof. dr hab. Janusz Braziewicz
1.9. Person conducting the discipline	prof. dr hab. Janusz Braziewicz
1.10. Contact	janusz.braziewicz@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE DISCIPLINE

2.1. Affiliation to module	faculty
2.2. Status of discipline	optional
2.3. Language of tuition	English
2.4. Semesters for performance of the discipline	Choice between 2nd-9th semester
2.5. Preliminary requirements	Basics of Physics and Mathematics

3. FORMS, WAYS AND METHODS OF CONDUCTING CLASSES

3.1.Types of classes		Lecture: 15, classes: 20
3.2.Way of conducting classes		Courses in the teaching rooms of JKU
3.2. Way of obtaining credits for classes		Credit with grade
3.4. Didactic methods		Lecture, classes
3.5. List of literature	**basic**	Jaakko Malmivuo, Robert Plonsey „Bioelectromagnetism" Principles and Applications of Bioelectric and Biomagnetic Fields, New York Oxford Oxford Universiy Press 1995

4. AIMS, PROGRAMME CONTENT AND EDUCATION OUTCOMES

4.1. Aims

C1- acquaintance with the physical and biological phenomena leading to electrical activity at the cellular level
C2- acquaintance with the mathematical basics of analysis of biomedical signals
C3- acquaintance with the principles of measuring the electrical activity of muscles and tissues
C4- acquaintance with the principles of measuring the electrical and magnetic activity of the brain

4.2. Programme content

1. Mathematical basis of signal analysis
2. Physical phenomena leading to the formation of electrical activity - cellular level
3. Macroscopic measurement of the electrical activity of the human body: Electrical function of muscle
4. Electrocardiography – electrical activity of the heart muscle. Holter measurement
5. Electromyography (EMG) - muscle electrical activity
6. Magnetoencephalography (MEG) - magnetic fields of the brain
7. Diagnostics using EEG
8. Diagnostic capabilities of signal analysis

4.3 Education outcomes in the discipline

code	Student who obtained credit	Reference to education outcomes	
within the scope of **KNOWLEDGE**:		**for discipline**	**Degree of saturation of outcome in discipline 1 [+] [++] [+++]**
W01	knows natural and artificial sources of ionizing radiation and its interaction with the matter;	B.W6	++
W02	knows the physical basis of non-invasive imaging methods;	B.W8	++
W03	knows the physical principles of selected therapeutic techniques, including ultrasound and radiation;	B.W9	++
within the scope of **SKILLS**:			
U01	uses the knowledge of the laws of physics to explain the impact of external factors such as temperature, acceleration, pressure, electromagnetic fields and ionizing radiation on the body and its elements;	B.U1	++
U02	assesses harmful ionizing radiation dose and applies the principles of radiation protection;	B.U2	++
U03	uses databases, including online ones, and searches for necessary information using available tools;	B.U11	+

4.4. Criteria for evaluation of obtained education outcomes				
Grade 3	**Grade 3,5**	**Grade 4**	**Grade 4,5**	**Grade 5**
Achievement <50 - 60)% of requirements used in the assessment methods	Achievement <61 – 70) % of requirements used in the assessment methods	Achievement <71 - 80) % of requirements used in the assessment methods	Achievement <81 - 90) % of requirements used in the assessment methods	Achievement <91 - 100> % of requirements used in the assessment methods

4.5. Evaluation methods							
Oral examination	**Written examination**	**Project**	**Colloquium - with grade**	**Homework**	**Presentation Reports**	**Discussions**	**Others**
			x	x	x	x	x

Criteria of assessment for oral response
1. Providing a comprehensive topic/ task/ answer.
2. The ability to integrate knowledge of the related field/ courses.
3. Independence or/and creativity in the presentation of the problems and proposed solutions.
4. Presentation of current knowledge associated with the course/ field.
5. Recognition of the problems arising from the task.

Criteria of assessment for written response
1. Content compliance with the topic of work/ task.
2. Providing a comprehensive answer on the topic/ task.
3. The ability to integrate knowledge of the related fields/ courses.
4. Independence or/and creativity in the presentation of the problems.
5. Presentation of current knowledge associated with the course/ field/, good selection of literature.

5. TOTAL ECTS CREDIT POINTS – STUDENT'S WORK LOAD

Category	Student's work load full-time study
Participation in didactic classes specified in the study plan (contact hours)	**35**
- Participation in lectures	**15**
- Participation in classes, discussion sessions, laboratories, etc.	**20**
Participation in consultations/ PRACTICAL CLASSES	
Preparation for examination/participation in examination, final test, etc.	
Others	
Independent student's work (non-contact hours)	**15**
Preparation for lecture	
Preparation for classes, discussion sessions, laboratory, etc.	**5**
Preparation for examination/colloquium	**10**
Collection of material for the project, web query	
Elaboration of multimedia presentation	
Preparation of entry for wikipedia	
Others	
Total number of hours	**50**
ECTS credit points for discipline	**2**