COURSE DESCRIPTION (SYLLABUS)

1.	Course: **Physicochemical Methods in Biology**
2.	Language of instruction: **English**
3.	Faculty: **Faculty of Biotechnology**
4.	Course/module code: **29-BT-S1-E2_EnPMB**
5.	Course/module type (*mandatory* or *elective*): **mandatory**
6.	Programme: **Biotechnology**
7.	Study cycle (*1st/2nd*): **1st cycle**
8.	Year: **1st**
9.	Semester *(autumn* or *spring):* **spring**
10.	Form of tuition and number of hours: **Lecture, 20 h**
11.	Coordinator(s): **Maria Wierzejewska, PhD, Prof. UWr** **Alicja Kluczyk, PhD**
12.	Initial requirements *(knowledge, skills, social competences)*: **no requirements**
13.	Objectives: **After completion of this course students should develop basic knowledge about the major physicochemical methods of analysis. They should be able to determine what technique should be used to solve different analytical problems with a particular emphasis placed on the subjects related to pharmacology and biology.**
14.	Content: • **Introductory Problems: The chemical and physical basis of the measurements. The Beer-Lambert relation and its analytical applications. Classification of physicochemical methods of analysis.**

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- **Atomic absorption and emission spectroscopy for trace metal analysis.**
- **Molecular spectroscopy: Basics of the UV-Vis absorption and emission spectrometry, its application in the qualitative and quantitative analysis. Infrared (IR) and Raman (R) spectroscopy as tools for structural analysis. Analytical applications of nuclear magnetic resonance (NMR) and electron paramagnetic resonance (EPR).**
- **Application of mass spectrometry to the natural products analysis.**
- **Fundamentals and classification of electrochemical methods; potentiometry coulometry, conductometry and voltammetry.**
- **Separation techniques: gas and liquid chromatography, gel and capillary electrophoresis and their application for identification and separation of the biology and medicine relevant samples.**
- **Principles of polarimetry and refractometry.**

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<tr><td>15.</td><td>Learning outcomes:
Student:
• has basic knowledge of physicochemical methods of analysis;
• is able to apply the knowledge of the appropriate principles to different analytical problems;
• understands the type of information that can be obtained from the measurement and limitation and/or requirements of the method.</td><td>Outcome symbols:

K1_W04, K1_W08

K1_U01, K1_U08

K1_K03</td></tr>
<tr><td>16.</td><td colspan="2">Recommended literature:
D.A. Skoog, D.M. West, F. J. Holler, S.R.Crouch, Fundamentals of Analytical Chemistry, Brooks/Cole, Cengage Learning;
G.D. Christian, P.K. Dasgupta, K.A. Schug, Analytical chemistry, Wiley.</td></tr>
<tr><td>17.</td><td colspan="2">Methods of verification of the assumed learning outcomes
Written exam.</td></tr>
<tr><td>18.</td><td colspan="2">Conditions of earning credits
Completion of the lecture is based on a written exam.</td></tr>
<tr><td rowspan="6">19.</td><td colspan="2">Student’s workload:</td></tr>
<tr><td>Activity</td><td>Number of hours for the activity</td></tr>
<tr><td>Hours of instruction (as stipulated in study programme) :
• Lect.: 20 h
• Consultations: 10 h</td><td>30 h</td></tr>
<tr><td>Student’s own work:
• preparation for the final exam</td><td>30 h</td></tr>
<tr><td>Total number of hours</td><td>60 h</td></tr>
<tr><td>Number of ECTS:</td><td>3 ECTS</td></tr>
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