# COURSE DESCRIPTION (SYLLABUS)

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| 1. | Course: <br><br> **Basic Laboratory Techniques** |
| 2. | Language of instruction <br><br> **English** |
| 3. | Faculty <br><br> **Faculty of Biotechnology** |
| 4. | Course/module code: <br><br> **29-BT-S1-E1-EnBlT** |
| 5. | Course/module type (*mandatory* or *elective*): <br><br> **mandatory** |
| 6. | Programme: <br><br> **Biotechnology** |
| 7. | Study cycle (*1st/2nd*): <br><br> **1st cycle** |
| 8. | Year: <br><br> **1st** |
| 9. | Semester  *(autumn* or *spring):* <br><br> **autumn** |
| 10. | Form of tuition and number of hours: <br><br> Laboratory: **15 h** <br><br> Learning methods: <br><br> **Students are provided with manuals before classes and are expected to read and understand tasks and experiments to be performed on a given day. Some calculations are to be done before classes. Classes are additionally preceded with short introductions (PowerPoint presentations) elucidating all possible difficulties students may meet. Students perform experiments individually or in pairs. Obtained results are calculated and/or presented as a graph at the end of the classes or as a homework.** |
| 11. | Coordinator(s): <br><br> **Justyna Ciuraszkiewicz, PhD** |
| 12. | Initial requirements (knowledge, skills, social competences): <br><br> • **Knowledge of chemistry and biology, and mathematical calculative skills on a secondary school level.** <br><br> • **Student is familiar with basics of Microsoft Excel or equivalent.** |
| 13. | Objectives <br><br> **The course is an introduction to the techniques commonly used in biochemistry laboratories, as well as to safety issues and good laboratory practices. The course also** |

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| | provides the theoretical background for the techniques. The proper use and care of the adjustable pipette, centrifuge, spectrophotometer and other laboratory equipment and supplies will be presented. |
| 14. | Content<br><br>**Pipetting** as one of the most critical laboratory skill; air and positive displacement pipettes, factors affecting the accuracy of pipetting, forward and reverse pipetting modes, general pipetting guidelines and best pipetting practices.<br><br>Ultraviolet–visible **absorption spectrometry** as quantitative analysis of samples, Transmittance and absorbance relationship, Beer-Lambert Law, absorption spectrum, isosbestic point.<br><br>**Centrifugation** as a technique used for the separation of components of heterogeneous mixtures or for purifying biological particles, differential and density gradient centrifugation, rotor types, rotation speed and centrifugal force, sedimentation coefficient.<br><br>**Laboratory safety rules.** |

| | Learning outcomes: | Outcome symbols: |
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| 15. | Student:<br>• **handles and uses laboratory equipment and apparatus correctly,**<br>• **is familiar with and follows the basic safety requirements and rules in a biochemistry laboratory,**<br>• **accurately performs basic laboratory procedures using laboratory instrumentation,**<br>• **carries out simple experiments under the guidance of a tutor,**<br>• **records laboratory experimental results in a clear and concise manner,**<br>• **carries out basic biochemical calculations,**<br>• **knows how to work as a part of a team,**<br>• **understands the importance of careful experimental planning and organization,**<br>• **learns a given subject by him/herself.** | K1_U01<br><br><br>K1_W10<br><br><br>K1_W08, K1_U07<br><br>K1_U05<br><br><br>K1_W01<br><br>K1_W01<br>K1_U13<br>K1_K03<br><br>K1_U12 |

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| 16. | Recommended literature:<br><br>• *Manual* **prepared for the actual practical course by the teacher - obligatory;**<br><br>• **Rodney F. Boyer,** *Biochemistry Laboratory: Modern Theory and Techniques*, **Pearson.** |
| 17. | Methods of verification of the assumed learning outcomes:<br><br>• **written test and evaluation of the student's work in the lab.** |
| 18. | Conditions of earning credits:<br><br>• **active participation in laboratory classes,**<br>• **correct performance of experiments,** |

| | | Activity | Number of hours for the activity |
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| 19. | | • **positive result from the written test.** | |
| | | Student's workload: | |
| | | Hours of instruction (as stipulated in study programme) :<br>• laboratory: 15 h | 15 h |
| | | Student's own work:<br>• preparation before classes,<br>• analysis of results,<br>• preparation for the final test. | 15 h |
| | | Total number of hours: | **30 h** |
| | | Number of ECTS: | **2 ECTS** |