**COURSE DESCRIPTION (SYLLABUS)**

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| 1. | Course:<br>**Cell Culture Techniques - advanced course** |
| 2. | Language of instruction:<br>**English** |
| 3. | Faculty:<br>**Faculty of Biotechnology** |
| 4. | Course/module code:<br>**29-BT-S2-E1-EngCell** |
| 5. | Course/module type (*mandatory* or *elective*):<br>**mandatory** |
| 6. | Programme:<br>**Medical Biotechnology** |
| 7. | Study cycle:<br>**2nd cycle** |
| 8. | Year:<br>**1st** |
| 9. | Semester (*autumn* or *spring*):<br>**Autumn** |
| 10. | Form of tuition and number of hours:<br>**Laboratory, 30 h** |
| 11. | Name, Surname, academic title:<br>**Aleksandra Marchwicka, PhD** |
| 12. | Initial requirements (knowledge, skills, social competences) regarding the course/module and its completion<br>**Basic knowledge about cell biology and basic skills in laboratory work.** |
| 13. | Objectives:<br>**Students are gain the practical knowledge of basic cytogenetic techniques and laboratory methods of apoptosis, necrosis, cell cycle analysis, as well as proliferation and differentiation of normal and cancerous cells.** |
| 14. | Content:<br>**The practicals will give Students hands-on experience in:**<br>• **good cell culture practice, including safety procedures, control of facilities, equipment, reagents;**<br>• **qualitative characteristics of mammalian cell cultures: cell counting and analysis;**<br>• **cryopreservation and cell banking;**<br>• **sterility and microbial contamination tests;**<br>• **maintenance and manipulation cell lines under various experimental conditions (mitogenic stimulation, exposure to cellular stresses and major signal transduction inhibitors);**<br>• **basic cytogenetic techniques;**<br>• **assessing the viability, cell cycle and proliferation of cells grown under various** |

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| | **experimental conditions using the MTT Cell Proliferation Assay and flow cytometry.** | |
| 15. | Learning outcomes:<br><br>**<u>Knowledge</u>**<br>• Student provides qualitative and quantitative descriptions of complex biological phenomena and processes.<br>• Student consistently applies and disseminates the principle of strict interpretation of biological phenomena and biochemical processes in research and practical activities which are based on empirical data.<br>• Student possesses advanced knowledge of medical and biological sciences, namely biochemistry, biotechnology and molecular biology.<br>• Student is familiar with the basic principles of health and safety and ergonomics procedures in the laboratory and follows the procedures of working with genetically modified organisms.<br>**<u>Skills:</u>**<br>• Student applies advanced technology and research tools in medical and biological sciences, namely biochemistry, biotechnology and molecular biology.<br>• Student efficiently makes use of scientific literature in the field of biomedicine and biotechnology; read professional literature in English.<br>• Student collects and interprets experimental data, synthesise it and make appropriate conclusions.<br>• Student shows ability to formulate legitimate opinions on the basis of data derived from different sources.<br>**<u>Social competence:</u>**<br>• Student understands the need for lifelong learning, inspires and organizes the learning process for other people.<br>• Student collaborates and work as part of a team in order to plan research and solve problems.<br>• Student shows ability to assess the risks of research techniques in biotechnology; arranges a safe workplace. | Outcome symbols:<br><br>K_W01, K_W02, K_W03, K_W09<br><br>K_U01, K_U02, K1_U06, K1_U07<br><br>K_K01, K_K02, K_K06 |
| 16. | Recommended literature:<br>• **Cancer cytogenetics: Chromosomal and molecular genetics aberrations of tumour cells, S. Heim, F. Mitelman, Wiley, 2009.** | |

<table>
<tr><td></td><td colspan="2">• The Biology of Cancer, R.A. Weinberg, Garland Science, 2014.</td></tr>
<tr><td>17.</td><td colspan="2">Methods of verification of the assumed learning outcomes:<br>• written test.</td></tr>
<tr><td>18.</td><td colspan="2">Conditions of earning credits:<br>• activity during classes<br>• exercise work report<br>• written test</td></tr>
<tr><td rowspan="5">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):</td><td>30 h</td></tr>
<tr><td>Student’s own work:<br>• preparation for classes,<br>• reading of the indicated literature,<br>• preparing a report,<br>• preparation for test.</td><td>25 h</td></tr>
<tr><td>Total number of hours:</td><td>55 h</td></tr>
<tr><td></td><td>Number of ECTS:</td><td>2 ECTS</td></tr>
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