COURSE DESCRIPTION CARD

<table>
<tr><td colspan="10">Faculty of Civil Engineering and Environmental Sciences</td></tr>
<tr><td>Field of study</td><td colspan="6"></td><td colspan="2">Degree level and programme type</td><td>BSc.</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6"></td><td colspan="2">Study profile</td><td>Academic profile</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Biochemistry of proteins</td><td colspan="2">Course code</td><td>IS-FCEE-00135S</td></tr>
<tr><td colspan="2">Course type</td><td>Erasmus</td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>Summer</td></tr>
<tr><td>15</td><td></td><td>30</td><td></td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>4</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Chemistry, Organic chemistry, Biochemistry</td></tr>
<tr><td>Course objectives</td><td colspan="9">Basic equipment in biochemical laboratory. Proteins as colloids. Protein solubility and protein excretion. Protein denaturation. Protein content in various biological samples. Structural and metabolic proteins in Eucaryota and Procaryota cells. Quantitative quantification of the protein content by using Lowry method, the ultraviolet absorbance method and the Bradford method in various biological samples. Electrophoretic separation of proteins from various biological samples by vertical polyacrylamide gel electrophoresis (SDS-PAGE method). Isolation of ribonucleoproteins from bovine (or pancreas).</td></tr>
<tr><td>Course content</td><td colspan="9">1. Health and Safety Rules. Introduction to the organization of biochemical laboratory. Preparation of hydrophilic colloid solutions. Examination of the solubility of globulins in water and diluted saline solutions. Protein thermal denaturation and protein coagulation.
2. Isolation of total protein from different types of biological samples: in vitro culture of human cells, bacterial cells and sewage sludge. Quantitative determination of protein in biological samples by using Lowry method.
3. Determination of protein content in biological samples by ultraviolet absorbance measurement. Determination of protein content in biological samples by using Bradford's method.
4. Electrophoretic separation of proteins from various biological samples by vertical polyacrylamide gel electrophoresis.
5. Extraction of ribonucleoproteins from fresh thymus or pancreatic bovine tissue.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Lectures, laboratory classes</td></tr>
<tr><td>Assessment method</td><td colspan="9">Lecture - written exam, laboratory - colloquia, laboratory tests</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="7">Learning outcomes</td><td colspan="2">Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="7">Student understands hygiene and safety rules during work in biochemical laboratory</td><td colspan="2">BT1_W02</td></tr>
</table>

LO2	**Student learned the basic biochemical techniques.**	**BT1_U06**
LO3	**Student has the ability to work with laboratory equipment.**	**BT1_W07**
LO4	**Student knows the use of biochemical research methods in modern biology and biotechnology.**	**BT1_W03**
LO5	**Student can carried out simple research experiments and analyses under the supervisor guidance.**	**BT1_U08**
LO6	**Student is able to collect an empirical data and interpret them**	**BT1_U08**
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	Written exam	**L**
LO2	Colloquium	**LC**
LO3	Colloquium	**LC**
LO4	Colloquium	**LC**
LO5	Written exam, colloquium	**L, LC**
LO6		
Student workload (in hours)		**No. of hours**
Calculation	Participation in lectures	**15**
	Participation in laboratory classes	**30**
	Preparation for the written exam in lectures	**30**
	Preparation for laboratory tests	**30**
	Preparation for and attendance at the examination	**20**
	Participation in consultations	**5**
	TOTAL:	**130**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	**52**	**2**
Student workload – practical activities	**115**	**4,5**

Basic references	**1. Gary Walsh, Proteins: Biochemistry and Biotechnology, 2nd Edition, Wiley-Blackwell 2014** **2. Paulo Almeida, Proteins: Concepts in Biochemistry, Garland Science 2016**
Supplementary references	**1. Scopes, Robert K., Protein Purification, Springer-Verlag New York 1994** **2. Hubert Rehm, Protein Biochemistry and Proteomics, Academic Press 2006**
Organisational unit conducting the course	**Department of Chemistry, Biology and Biotechnology** / **Date of issuing the programme**
Author of the programme	**Dr Agata Jabłońska-Trypuć** / **05.03.2021**

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar