

**Table 5.2** Course specification

Type and level of studies: Bachelor Academic Degree			
<b>Course name: Experimental Biochemistry</b>			
Course status: compulsory			
Number of ECTS credits: 7			
Requirement: none			
<b>Course aim</b>			
The goal of the course is to 1) provide students with the fundamental knowledge of contemporary methods used in biochemical laboratories for isolation, purification and characterization of biomolecules 2) develop students' ability to choose the appropriate experimental procedure by applying gained knowledge and understanding of the fundamental physicochemical properties of biomolecules, 3) acquire a wide range of practical (experimental) skills related to biochemical techniques.			
<b>Course outcome</b>			
Students will be able to (1) understand the fundamental principles and the dependence between the selection and sequence of biochemical techniques used for the isolation, purification and characterization of biomolecules and their physicochemical characteristics, (2) properly and safely handle basic equipment, consumables and chemicals in biochemistry laboratory, (3) apply appropriate experimental procedures for isolation, purification and characterization, (4) interpret experimental results and write reports.			
<b>Course content</b>			
<i>Theory</i>			
Homogenization. Extraction. Lyophilization. Precipitation: isoelectric, salting in/out, with organic solvents. Preparative centrifugation of biomolecules and cell organelles. Size-based separation of biomolecules: dialysis and electro dialysis, ultrafiltration and reverse osmosis. Chromatographic methods: size exclusion, adsorption, hydrophobic, ion-exchange, affinity and partition chromatography. High performance liquid chromatography. Gas chromatography. Chosen spectroscopic methods (UV-VIS spectrometry, spectrofluorimetry, circular dichroism) in experimental biochemistry. Immunochemical and radioisotope methods. Electrophoresis (SDS, PAGE, disc). Electrophoresis of proteins and nucleic acids (blotting). Polymerase chain reaction (PCR). Cell cultures in biochemistry.			
<i>Practice: Practical classes, OFT</i>			
Isolation and purification of amino acids, proteins, lipids, enzymes, vitamins, polysaccharides, cellular components, DNA, and RNA from natural sources. Western blott. PCR.			
<b>Literature</b>			
1. K. Kuhajda, I. Beara, M. Lesjak: Eksperimentalna biohemija, PMF, N. Sad, 2013.			
2. K. Kuhajda, I. Beara, M. Lesjak: Praktikum iz eksperimentalne biohemija, interna skripta			
3. N. Mimica-Dukić, K. Kuhajda: Biohemija i preparativna biohemija, problemi i rešenja, UNS, 2000.			
<i>Additional readings</i>			
1. A. Pingoud, C. Urbanke, J. Hoggett, A. Jeltsch: Biochemical Methods, Wiley-VCH Verlag, 2010.			
2. A. Ninfa, D. Ballou, M. Benore: Fund. Laboratory Approaches for Biochem. and Biotechn., Wiley, 2010.			
3. R. Boyer: Biochemistry Laboratory: Modern Theory and Techniques, Pearson Education, 2006.			
4. K. Wilson, J. Walker: Principles and Techn. of Biochem. and Molec. Biol., Cambridge Univ. Press, 2005.			
<b>Number of classes of active teaching</b>			Other classes
Lectures: 3 (45)	Practice:	OFT: 5 (75)	
<b>Teaching methods</b>			
Lectures, laboratory work, seminar(s)			
<b>Assessment of knowledge (maximum of 100 points)</b>			
<b>Pre-exam obligations</b>	<b>Points</b>	<b>Final exam</b>	<b>points</b>
activity during lecture classes	10	written exam	60
practical teaching	20		
seminars	10		