

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	BIOKEMIJSKI PRAKTIKUM
<b>Course Title:</b>	PRACTICAL COURSE IN BIOCHEMISTRY

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
UN Biokemija, 1. stopnja	/	1.	2.
USP Biochemistry, 1 <sup>st</sup> Cycle	/	1 <sup>st</sup>	2 <sup>nd</sup>

**Vrsta predmeta / Course Type:**

obvezni / Mandatory

**Univerzitetna koda predmeta / University Course Code:**

BK111

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
/	15	60 LV	/	/	75	5

**Nosilec predmeta / Lecturer:**

doc. dr. Miha Pavšič / Dr. Miha Pavšič, Assistant Professor

**Jeziki / Languages:**

**Predavanja / Lectures:** slovenski / Slovenian

**Vaje / Tutorial:** slovenski / Slovenian

**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.

**Prerequisites:**

The course has to be assigned to the student.

**Vsebina:**

Varnost v biokemijskem laboratoriju, pisanje laboratorijskega dnevnika in delovnega poročila, čiščenje laboratorijske posode, priprava in shranjevanje reagentov, kvantitativni prenos tekočin  
statistična analiza eksperimentalnih rezultatov, pH, pufri, elektrode, biosenzorji, merjenje koncentracije proteinov  
merjenje koncentracije nukleinskih kislin, dializa, ultrafiltracija, liofilizacija, kromatografske metode v biokemiji: ionska izmenjevalna, gelska, afinitetna, FPLC, elektroforetske metode v biokemiji, spektroskopske analize biomolekul, uporaba izotopov v biokemiji, centrifugiranje v biokemijskem laboratoriju

**Content (Syllabus outline):**

Safety in the biochemical laboratory, writing laboratory journals and work reports, cleaning of laboratory glassware, preparation and storage of reagents, quantitative transfer of liquids, statistical analysis of experimental results, pH, buffers, electrodes, biosensors, measuring the concentration of proteins and nucleic acids, dialysis, ultrafiltration, lyophilisation, chromatographic methods in biochemistry: ion exchange chromatography, size-exclusion chromatography, affinity chromatography, FPLC, electrophoretic methods in biochemistry, spectroscopic analysis of biomolecules, the use of isotopes in biochemistry, centrifugation in the biochemical laboratory.

**Temeljna literatura in viri / Readings:**

- Kuhelj R: Biokemija v praksi: načela in tehnike, 3. izdaja, FKKT, Ljubljana, 2003, 100 strani  
 - Boyer R: Biochemistry Laboratory: Modern Theory and Techniques, 2nd ed. Prentice Hall, 2011, 350 strani (50%)

**Cilji in kompetence:**

Študent bo spoznal osnovne biokemijske tehnike in pravila, ki veljajo za delo v biokemijskih laboratorijih. Po opravljenih obveznostih bo sposoben samostojno izvesti osnovne biokemijske analize na osnovi pisnih navodil.

**Objectives and Competences:**

Students will learn the basic biochemical techniques and rules for safe work in a biochemical laboratory. After successful completion of the course students will be able to independently perform essential biochemical analyses following written instructions.

**Predvideni študijski rezultati:**Znanje in razumevanje

Študent bo poznal osnovne tehnike, ki se najpogosteje uporabljajo v biokemijskih laboratorijih in razumel njihove teoretične osnove.

Uporaba

Študent bo znal uporabljati osnovne biokemijske tehnike.

Refleksija

Študent se bo zavedal uporabnosti in omejitev posameznih metod ter pomena upoštevanja pravil pri delu v laboratoriju

Prenosljive spretnosti

Osnovne spretnosti za delo v biokemijskem laboratoriju, spretnosti uporabe domače in tuje literature in drugih virov, zbiranja in interpretiranja podatkov, uporaba IKT, uporaba različnih postopkov, poročanje (ustno in pisno), identifikacija in reševanje problemov, sposobnost organiziranega in natančnega dela.

**Intended Learning Outcomes:**Knowledge and Comprehension

Students will get acquainted with the basic techniques most often used in biochemical laboratories and understand their theoretical basis.

Application

Students will be able to use basis biochemical techniques.

Analysis

Students will reflect on the use and restrictions of different methods and the importance of following safety procedures during laboratory work.

Skill-transference Ability

Basic skills for working in a biochemical laboratory, use of domestic and foreign literature and other sources, collecting and interpreting data, use of ICT, use of protocols, reporting (oral and written), problem identification and solving, ability of organized and precise work.

**Metode poučevanja in učenja:**

Seminarji in laboratorijske vaje.

**Learning and Teaching Methods:**

Seminars and laboratory courses.

**Načini ocenjevanja:**

Opravljenе vaje so pogoj za pristop k izpitu.  
 Pisni izpit  
 Ocene: 6-10 (pozitivno), 1-5

Delež (v %) /

Weight (in %) **Assessment:**

Completed laboratory course is prerequisite for the exam.  
 Written exam

(negativno).

Grades: 6-10 (positive), 1-5 (negative)

**Reference nosilca / Lecturer's references:**

- ŽAGAR, Tomaž, **PAVŠIČ, Miha**, GABER, Aljaž. Destabilization of EpCAM Dimer Is Associated with Increased Susceptibility towards Cleavage by TACE. PeerJ, 2021, 9, e11484.
- TSAKTANIS, Thanos, KREMLING, Heidi, **PAVŠIČ, Miha**, von STACKELBERG, Ricarda, MACK, Brigitte, FUKUMORI, Akio, STEINER, Harald, VIELMUTH, Franziska, SPINDLER, Volker, HUANG, Zhe, JAKUBOWSKI, Jasmine, STOECKLEIN, Nikolas H., LUXENBURGER, Elke, LAUBER, Kirsten, LENARČIČ, Brigita, GIRES, Olivier. Cleavage and Cell Adhesion Properties of Human Epithelial Cell Adhesion Molecule (HEPCAM). Journal of Biological Chemistry, 2015, 290, 40, 24574–24591.
- NOVINEC, Marko, **PAVŠIČ, Miha**, LENARČIČ, Brigita. A Simple and Efficient Protocol for the Production of Recombinant Cathepsin V and Other Cysteine Cathepsins in Soluble Form in Escherichia coli. Protein Expression and Purification, 2012, 82, 1, 1–5.