Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Biokemija
Course title:	Biochemistry

Študijski program in stopnja Study programme and level	**Študijska smer Study field**	**Letnik Academic year**	**Semester Semester**
Univerzitetni študijski program: Ekologija, 1. stopnja		**1.**	**2.**
Undergraduate university programme: Ecology with Nature Conservation, 1st level		**1st**	**2nd**

Vrsta predmeta / Course type	Obvezni/Compulsory
Univerzitetna koda predmeta / University course code:	**B054**

Predavanja Lectures	**Seminar Seminar**	**Sem. vaje Tutorial**	**Lab. vaje Laboratory work**	**Teren. vaje Field work**	**Samost. delo Individ. work**	**ECTS**
45			**30**		**105**	**6**

Nosilec predmeta / Lecturer:	Marjanca STARČIČ ERJAVEC

Jeziki / Languages:	**Predavanja / Lectures:**	**Slovenski/Slovene**
	Vaje / Tutorial:	**Slovenski/Slovene**

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Jih ni.	No.

Vsebina:

Predavanja:

- Aminokisline, peptidi, proteini: struktura, funkcija, metabolizem;
- Ogljikovi hidrati: struktura, funkcija, metabolizem;
- Lipidi: struktura, funkcija, metabolizem;
- Nukleinske kisline: struktura, funkcija, metabolizem;
- Dihalna veriga in oksidativna fosforilacija, fotosinteza;
- Hormoni: struktura, funkcija in metabolizem.

Vaje:

- Kvalitativne in kvantitativne metode določanja vsebnosti proteinov, lipidov in ogljikovih hidratov v bioloških vzorcih;
- Preparativne metode: homogenizacija, ekstrakcija, frakcionirano obarjanje, gelska kromatografija, elektroforeza;
- Encimatika: kinetika, določanje encimskih enot, karakterizacija proteinov: SDS-PAGE, ocena molekulske mase in čistosti.

Content (Syllabus outline):

Lectures:

- Amino acids, peptides, proteins: structure, function, metabolism;
- Carbohydrates: structure, function, metabolism;
- Lipids: structure, function, metabolism;
- Nucleic acids: structure, function, metabolism;
- Respiratory chain and oxidative phosphorylation, photosynthesis;
- Hormones: structure, function, metabolism.

Tutorial:

- Qualitative and quantitative methods for the determination of protein, lipid and carbohydrate content in biological samples;
- Preparative methods: homogenization, extraction, fractionary precipitation, gel chromatography, electrophoresis;
- Enzymatics: kinetics, determination of enzyme units, protein characterization: SDS-PAGE, molecular weight estimation and purity assessment.

Temeljni literatura in viri / Readings:

- Ahern, K., Rajagopal, I., Tan, T. (2018). Biochemistry free for all. Oregon State University. Dostopno na: Biochemistry: Free For All - Open Textbook Library
- Nelson, D. L., Cox, M. M. (2005). *Lehninger principles of biochemistry* (4. izdaja, str. XXV, 1119 , 91). W. H. Freeman.
- Boyer, R. F. (2005). *Temelji biokemije* (str. XXVI, 634). Študentska založba.

Cilji in kompetence:

Seznanitev študentov s kemijsko zgradbo in reakcijami v biotskih sistemih

Objectives and competences:

To inform students about chemical structure and reactions in biotic systems

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: • Študent pozna kemijske sestavine živih organizmov in zna pojasniti njihove funkcije ter medsebojne pretvorbe.	Knowledge and understanding: • The student knows chemical constituents of living organisms and can explain their functions and their interconversions.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Laboratorijske vaje	• Lectures • Laboratory practicals

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Kolokvij • Pisni izpit	**50** **50**	• Midterm exam • Written exam

Reference nosilca / Lecturer's references:

1. MOLAN, Katja, AMBROŽIČ, Jerneja, LIKAR, Matevž, PONGRAC BARLOVIČ, Draženka, ŽGUR-BERTOK, Darja, **STARČIČ ERJAVEC, Marjanca**. Fecal short-chain fatty acids are associated with obesity in gestational diabetes. *Biomedicines*. [Online ed.]. 2025, vol. 13, iss. 2, [article no.] 387, str. 1-13.
2. KUZNETSOVA, Marina V., MIHAILOVSKAYA, Veronika S., SELIVANOVA, Polina A., KOCHERGINA, Darja A., REMEZOVSKAYA, Natalia B., **STARČIČ ERJAVEC, Marjanca**. Siderophore production, diversity of siderophore receptors and associations with virulence-associated genes, phylogroups and bacteriocin production in Escherichia coli strains isolated from humans, animals and organic fertilizers. *Microbiology research*. 2025, vol. 16, iss. 2, [article no.] 50, 14 str.
3. PREDOJEVIĆ, Luka, KEŠE, Darja, ŽGUR-BERTOK, Darja, KORVA, Miša, ERDANI-KREFT, Mateja, **STARČIČ ERJAVEC, Marjanca**. Cytokine response of the biomimetic porcine urothelial model to different *Escherichia coli* strains. *Applied sciences*. 2022, iss. 17, art. 8567, str. 1-11.
4. ŽELEZNIK RAMUTA, Taja, TRATNJEK, Larisa, JANEV, Aleksandar, SEME, Katja, **STARČIČ ERJAVEC, Marjanca**, ERDANI-KREFT, Mateja. The antibacterial activity of human amniotic membrane against multidrug-resistant bacteria associated with urinary tract infections : new insights from normal and cancerous urothelial models. *Biomedicines*. [Online ed.]. 2021, vol. 9, iss. 2, str. 1-22.
5. TRAJKOVA, Marija, MOLAN, Katja, ZUGAN, Maja, AMBROŽIČ, Jerneja, **STARČIČ ERJAVEC, Marjanca**, ŽGUR-BERTOK, Darja, PONGRAC BARLOVIČ, Draženka. Increased fecal indole concentration in women with gestational diabetes : a pilot study. *Acta diabetologica*. 2021, vol. 58, no. 2, str. 241-243.