



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

|                      |              |
|----------------------|--------------|
| <b>Predmet:</b>      | Biokemija    |
| <b>Course title:</b> | Biochemistry |

| Študijski program in stopnja<br>Study programme and level             | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|-----------------------------------------------------------------------|-------------------------------|-------------------------|----------------------|
| Univerzitetni študijski program:<br>Biologija, 1. stopnja             |                               | 1.                      | 2.                   |
| Undergraduate university<br>programme: Biology, 1 <sup>st</sup> level |                               | 1 <sup>st</sup>         | 2 <sup>nd</sup>      |

Vrsta predmeta / Course type

Obvezni/Compulsory

Univerzitetna koda predmeta / University course code:

B132

| Predavanja<br>Lectures | Seminar<br>Seminar | Sem. vaje<br>Tutorial | Lab. vaje<br>Laboratory work | Teren. vaje<br>Field work | Samost. delo<br>Individ. work | ECTS |
|------------------------|--------------------|-----------------------|------------------------------|---------------------------|-------------------------------|------|
| 45                     |                    |                       | 45                           |                           | 90                            | 6    |

Nosilec predmeta / Lecturer:

Marjanca STARČIČ ERJAVEC

Jeziki /

Languages:

Predavanja /

Lectures:

Vaje / Tutorial:

Slovenski/Slovene

Slovenski/Slovene

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

Jih ni.

Prerequisites:

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:**

## Znanje in razumevanje:

- Študent pozna kemijske sestavine živih organizmov in zna pojasniti njihove funkcije ter medsebojne pretvorbe.

**Intended learning outcomes:**

## Knowledge and understanding:

- The student knows chemical constituents of living organisms and can explain their functions and their interconversions.

**Metode poučevanja in učenja:**

- Predavanja
- Laboratorijske vaje

**Learning and teaching methods:**

- Lectures
- Laboratory practicals

**Načini ocenjevanja:**

- Kolokvij
- Pisni izpit

Delež (v %) /

Weight (in %)

**Assessment:**

- 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.