



Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in
matematiko
Faculty of Natural Sciences and
Mathematics



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Biokemija
Subject Title:	Biochemistry

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Biologija/Biology	Biologija/Biology	1	2

Univerzitetna koda predmeta / University subject code:

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

Nosilec predmeta / Lecturer:

Janja TRLEK

Jeziki /

Languages:

Predavanja /

Lecture:

slovenski / Slovenian

Vaje / Tutorial:

slovenski / Slovenian

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

Prerequisites:

Vsebina:

- Proteini: aminokisline, peptidi, proteini, encimi, koencimi, imobilizirani encimi, metabolizem proteinov in aminokislin.
- Ogljikovi hidrati: struktura, klasifikacija, funkcija, razgradnja, biosinteza.
- Lipidi: struktura, klasifikacija, funkcija, razgradnja, biosinteza.
- Nukleinske kisline: struktura, biosinteza in funkcija, razgradnja.
- Dihalna veriga in oksidativna fosforilacija, fotosinteza.
- Hormonski mehanizmi.
- Vaje: Preparativne metode: homogenizacija, ekstrakcija, frakcionirano obarvanje, gelska kromatografija, elektroforeza. Analitske metode: reakcije na proteine, lipide in ogljikove hidrate. Encimatika: kinetika, določanje encimske enote.

Contents (Syllabus outline):

- Proteins: amino acids, peptides, proteins, enzymes, coenzymes, immobilized enzymes, metabolism of proteins and amino acids.
- Carbohydrates: structure, classification, function, catabolism, biosynthesis.
- Lipids: structure, classification, function, digestion, biosynthesis.
- Nucleic acids: structure, biosynthesis and function, degradation.
- Respiratory chain and oxidative phosphorylation, photosynthesis.
- Hormone mechanisms.
- Practicum: Preparative methods: homogenization, extraction, fractionary precipitation, gel chromatography, electrophoresis. Analytical methods: reactions on proteins, lipids and carbohydrates. Enzymatics: kinetics, determination of the enzyme unit.

Temeljni študijski viri / Textbooks:

- Nelson, D. L., M. M. Cox, 2005: Lehninger principles of biochemistry. W. H. Freeman and Comp., New York.
- Senčič, L., 2001: Navodila za vaje iz biokemije za študente Pedagoške fakultete. Pedagoška fakulteta, Maribor.

Cilji:

- Seznanitev študentov s kemijsko zgradbo in reakcijami v biotskih sistemih.

Objectives:

- To inform students about chemical structure and reactions in biotic systems

Predvideni študijski rezultati:**Intended learning outcomes:****Znanje in razumevanje:**

- Poznavanje kemijskih sestavin živih organizmov in razumevanje njihove funkcije ter medsebojnih pretvorb

Prenesljive/ključne spretnosti in drugi atributi:

- Sposobnost uporabe osnovne literature iz biokemije, modelov biomolekul in tabel metabolnih poti
- Delo z nizkotlačno kolonsko kromatografijo in elektroforezo
- Praktično znanje izolacije lipidov in proteinov iz organizmov
- Izvedba kvalitativnih in kvantitativnih reakcij na proteine, lipide in ogljikove hidrate
- Določitev encimske aktivnosti

Knowledge and Understanding:

- Knowledge of chemical constituents of living organisms and understanding their function and their interconversions

Transferable/Key Skills and other attributes:

- Capability of using basic biochemistry literature, models of biomolecules and tables with metabolic pathways
- Working with low pressure column chromatography and electrophoresis.
- Practical knowledge of isolation of lipids and proteins from organisms
- Carrying out qualitative and quantitative reactions on proteins, lipids and carbohydrates
- Determination of the enzyme activity

Metode poučevanja in učenja:**Learning and teaching methods:**

- Predavanja
- Laboratorijske vaje

- Lectures
- Laboratory exercises

Načini ocenjevanja:Delež (v %) /
Weight (in %)**Assessment:**

- Kolokvij iz vaj
- Pisni izpit

40
60

- Partial exam of laboratory exercises
- Written exam

Materialni pogoji za izvedbo predmeta :

- Multimedijska predavalnica
- Laboratorij za biokemijo

Material conditions for subject realization

- Lecture hall for multimedia presentations
- Laboratory for biochemistry

Obveznosti študentov:

(pisni, ustni izpit, naloge, projekti)

Students' commitments:

(written, oral examination, coursework, projects):

• Kolokvij iz vaj • Pisni izpit	• Partial exam of laboratory exercises • Written exam
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