



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
Ekologija z naravovarstvom /Ecology with Nature Conservation	Ekologija z naravovarstvom /Ecology with Nature Conservation	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 TRČEK

Jeziki /
Languages:

Predavanja /
Lecture:

slovenski/Slovenian

Vaje / Tutorial:

slovenski/Slovenian

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

Prerequisites:

Opravljen izpit iz kemije

Chemistry examination passed

Vsebina:

Contents (Syllabus outline):

- 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:

- 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.

homogenizacija, ekstrakcija, frakcionirano obarjanje, gelska kromatografija, elektroforeza. Analitske metode: reakcije na proteine, lipide in ogljikove hidrate. Encimatika: kinetika, določanje encimske enote.

- 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:

- Berg, J.M., Tymoczko, J.L., Stryer L., 2005: Biochemistry. W. H. Freeman & Company, New York.
- Christen, P., Jaussi, R., 2006: Biochemie: Eine Einfuehrung mit 40 Lernenheiten. Springer Verlag, 1st Edition, Berlin and New York.
- Nelson, D. L., M. M. Cox, 2005: Lehninger principles of biochemistry. W. H. Freeman and Company, New York.
- Senčič, L., 2001: Navodila za vaje iz biokemije za študente Pedagoške fakultete. Pedagoška fakulteta, Maribor.
- Voeth J.G., Voeth D, Pratt C.W., 2006: Fundamentals of Biocheistry: Life at the Molecular Level. Benjamin Cummnngs, USA.

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:

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

Intended learning outcomes:

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:

- Predavanja
- Laboratorijske vaje

Learning and teaching methods:

- Lectures
- Laboratory excersises

Načini ocenjevanja:

Delež (v %) / **Assessment:**

Weight (in %)		
• Ustni izpit	80	• Oral examination
• Pisni izpit	20	• Written examination

Materialni pogoji za izvedbo predmeta :

- Multimedijska predavalnica
- Laboratorij za biokemijo

Obveznosti študentov:

(pisni, ustni izpit, naloge, projekti)

- Ustni izpit
- Pisni izpit

Material conditions for subject realization

- Lecture hall for multimedia presentations
- Laboratory for biochemistry

Students' commitments:

(written, oral examination, coursework, projects):

- Oral examination
- Written examination