



Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in
matematiko
Faculty of Natural Sciences
and Mathematics



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Kemija
Subject Title:	Chemistry

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Izobraževalna biologija / Educational Biology		1	Zimski ali poletni

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:

Jeziki / Languages:	Predavanja / Lecture:	Slovenski /Slovenian
	Vaje / Tutorial:	Slovenski /Slovenian

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

Prerequisites:

Ni pogojev

No prerequisites

Vsebina:

Contents (Syllabus outline):

Najprej so obravnavani osnovni pojmi in zakonitosti splošne kemije, v drugem delu predmeta pa je več povedano o organski kemiji in kemiji procesov v okolju. Prvi del vključuje:

- izgradnja periodnega sistema (aufbau princip),
- tipi vezi med atomi,
- stehiometrija,
- kemijska termodinamika in kinetika, ravnotežje,
- redoks reakcije,
- kislost in bazičnost, pH, pufri,
- poimenovanje spojin.

V drugem sklopu pa je poudarek na naslednjih poglavjih:

- tipi organskih spojin, izomerija,
- stereokemija,
- vplivi skupin na reaktivnost molekul, organske kisline in baze,
- biološko pomembne organske spojine: aminokisline, ogljikovi hidrati, lipidi,
- organski polutanti
- osnove organske analize (FTIR, NMR, MS).

Firstly, basic principles and laws of general chemistry are discussed, in the continuation of the course the emphasis will be on organic chemistry and on the chemistry of environmental processes. The first part includes:

- Aufbau principle
- Bonds between atoms
- Stoichiometry
- Nomenclature
- Chemical thermodynamics and kinetics, balance management
- Redox reactions
- Acidity, pH, buffers

In the continuation the emphasis is on the following:

- Types of organic compounds, isomerism
- Stereochemistry
- Structure reactivity relationships
- Biologically important organic compounds: amino acids, carbohydrates, lipids
- Organic pollutants
- Bases of organic analysis (FTIR, NMR, MS)

Temeljni študijski viri / Textbooks:

- Andrews J. E. P. Brimblecombe, T. Djickells, P. S. Liss, B. J. Reid, 2003: An Introduction to Environmental Chemistry, Blackwell Science (UK).
- Lazarini, F., J. Brenčič, 1984: Splošna in anorganska kemija, DZS, Ljubljana.
- Pine, S.: 1996: Organic Chemistry 5th edition, McGraw Hill.
- Tišler, M., 1982: Organska kemija, DZS, Ljubljana.

Cilji:

- Podati pregled splošne kemije
- Razložiti strukturne vplive spojin na reaktivnost in spreminjanje okolja
- Predstaviti kemizem najpogostejših onesnažil (polutantov)
- Podati osnove analiziranja spojin

Objectives:

- To give the general overview of chemistry
- To explain the structural influences of compounds on the environment.
- To present the chemistry of the most common pollutants.
- To present the bases of instrumental analysis.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:

- Povezovanje atomov v spojine
- Razumevanje osnovnih kemijskih procesov preoblikovanja molekul
- Razumevanje vplivov strukture spojine na reaktivnost
- Razumevanje povezanosti kemijskih ciklusov okolja
- Osnovno znanje kemijske analize

Prenesljive/ključne spretnosti in drugi atributi:

- Prepoznavanje spojin v okolju in njihovega pomena
- Jemanje vzorcev tal, vode in zraka za analizo
- Poznavanje in predvidevanje vpliva sintetičnih spojin na okolje

Knowledge and Understanding:

- Molecule building.
- Basic concepts of chemical reactions.
- Understanding of structure – reactivity relationships.
- Understanding of environmental elemental cycles.
- Bases of instrumental analysis.

Transferable/Key Skills and other attributes:

- Recognition of compounds in the environment and their impact.
- Sample collection for chemical analysis.
- Prediction of the influence of synthetic compounds on the environment.

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje

Learning and teaching methods:

- Lectures
- Laboratory work

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

• Kolokvij iz vaj	20	• Partial exam of laboratory exercises
• Ustni izpit	40	• Oral exam
• Pisni izpit	40	• Written exam

Materialni pogoji za izvedbo predmeta :

- Multimedijska predavalnica
- Kemijski laboratorij

Material conditions for subject realization

- Lecture hall for multimedia presentations
- Chemical laboratory

Obveznosti študentov:

(pisni, ustni izpit, naloge, projekti)

- Kolokvij iz vaj
- Ustni Izpit
- Pisni Izpit

Students' commitments:

(written, oral examination, coursework, projects):

- Partial exam of laboratory exercises
- Oral examination
- Written examination