



Univerza v Mariboru  
University of Maribor

Fakulteta za naravoslovje in  
matematiko  
Faculty of Natural Sciences  
and Mathematics

**OPIS PREDMETA / SUBJECT SPECIFICATION**

<b>Predmet:</b>	Mikrobna ekologija
<b>Subject Title:</b>	Microbial Ecology

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	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
30			15		135	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:

Jih ni.

No.

**Vsebina:**

V okviru predmeta bodo študentje spoznali vlogo mikroorganizmov v različnih naravnih (vodna, talna ekstremna okolja, prebavila vretenčarjev in nevretenčarjev) in industrijskih (biotehnologija, mikrobiologija hrane) okoljih. Prav tako bodo spoznali metode za preučevanje mikrobne aktivnosti.

V vsakem naravnem okolju bomo obravnavali mikrobno raznolikost in mikrobno aktivnost.

**Contents (Syllabus outline):**

Students will get familiar with the role of microorganisms in different natural (water, soil, extreme environments, gut of vertebrates and nonvertebrates) and industrial (biotechnology, food microbiology) environments. The methods for studying microbial activity will be presented.

In each natural environment, the microbial diversity and activities will be discussed.

They will get familiar with possible application of microorganisms in

Seznani se bodo z načini uporabe mikroorganizmov v biotehnologiji in mikroorganizmi kot viri industrijsko uporabnih encimov in drugih snovi.

Opisan bo tudi vidik tveganja vnosa mikroorganizmov v okolje (patogenih, rekombinantnih in industrijskih sevov).

Spoznali bodo interakcije bakterij s težkimi kovinami in ksenobiotiki ter možnosti za njihovo uporabo pri bioremediaciji.

Seznani se bodo z mikrobiološkimi vidiki delovanja čistilnih naprav.

Pri praktičnem delu bodo študentje izolirali mikroorganizme iz vod, tal in hrane, ter si ogledali izbrane objekte (prehrambna industrija, čistilne naprave).

biotechnology as well as with microorganisms as sources of industrially important enzymes and other substances.

A risk of microbial release into environment will be discussed (pathogenic, recombinant and industrial strains).

Interactions of prokaryotes with heavy metals and xenobiotics as well as their potential use in bioremediation will be addressed.

The microbiological aspects in waste treatment systems will be presented.

In practical work, students will perform isolation of microorganisms from water, soil and food. Besides, they will visit selected industrial installations (food industry, waste treatment plants).

#### **Temeljni študijski viri / Textbooks:**

- Madigan, M.T., J.M. Martinko, J. Parker, 2003: Brock Biology of microorganisms. 10. izdaja, Prentice Hall.
- Tortora G.J., Funke, B.R., Case, .L., 2006: Microbiology: A Introduction. 9th Ed., Blackwell Publ., UK.
- Trun J.N., Trempy J.E., 2005: Fundamental Bacterial Genetics. Blackwell Publishing, UK.

#### **Cilji:**

- Predstaviti raznolikost in vlogo mikroorganizmov v različnih okoljih
- Predstaviti potencialno nevarnost vnosa mikroorganizmov v okolje
- Predstaviti možno uporabo mikroorganizmov v industriji in drugih procesih

#### **Objectives:**

- Familiarity with diversity and role of microorganism in different environments.
- Presentation of a potential risk of uncontrolled release of microorganisms into environment.
- Presentation of possible applications of microorganism in industry and other processes.

#### **Predvideni študijski rezultati:**

Znanje in razumevanje:

- Ekološko pomembne skupine mikroorganizmov ter razumevanje njihove pozitivne in negativne vloge v različnih okoljih
- Njihova vloga pri biotehnoloških procesih
- Metode v mikrobni ekologiji in biotehnologiji

#### **Intended learning outcomes:**

Knowledge and Understanding:

- Ecologically important groups of microorganisms and their potential positive or negative effects within environments
- Their role in biotechnological processes
- Methods used in microbial ecology and biotechnology

Prenesljive/ključne spretnosti in drugi atributi:

- Seznanjitev z metodami proučevanja značilnosti, uporabe in nadzovanja mikroorganizmov v okolju

Transferable/Key Skills and other attributes:

- Getting familiar with the methods for studying characteristics, applications and control of microorganisms in environments

**Metode poučevanja in učenja:**

- Predavanja
- Seminar
- Seminarske vaje

**Learning and teaching methods:**

- Lectures
- Seminar
- Seminar excersises

**Načini ocenjevanja:**

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

- Pisni izpit

100

- Written exam

**Materialni pogoji za izvedbo predmeta :**

- *Multimedijska predavalnica*
- *Laboratorij*

**Material conditions for subject realization**

- *Lecture hall for multimedia presentations*
- *Laboratory*

**Obveznosti študentov:**

*(pisni, ustni izpit, naloge, projekti)*

- Pisni izpit
- Kolokvij – pisni

**Students' commitments:**

*(written, oral examination, coursework, projects):*

- Written exam
- Written exam - practical work