



OPIS PREDMETA / SUBJECT SPECIFICATION

|                |                        |
|----------------|------------------------|
| Predmet:       | <b>Ekoremediacije</b>  |
| Subject Title: | <b>Ecoremediations</b> |

| Študijski program<br>Study programme   | Študijska smer<br>Study field                                 | Letnik<br>Year | Semester<br>Semester |
|--|---|----------------|----------------------|
| Biologija in ekologija z naravovarstvom / Biology and ecology with nature conservation | Ekologija z naravovarstvom / Ecology with Nature Conservation | 1              | 2                    |

Univerzitetna koda predmeta / University subject code:

| Predavanja<br>Lectures | Seminar<br>Seminar | Sem. vaje<br>Tutorial | Lab. vaje<br>Lab. work | Teren. vaje<br>Field work | Samost. delo<br>Individ. work | ECTS |
|------------------------|--------------------|-----------------------|------------------------|---------------------------|-------------------------------|------|
| 30                     | 15                 | 30                    |                        |                           | 135                           | 7    |

Nosilec predmeta / Lecturer:

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

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

**Vsebina:**

Vsebina predmeta je sestavljena iz petih osnovnih sklopov.

- Predstavitev osnovnih pojmov: remediacija, bioremediacija, fitoremediacija, ekoremediacija (ERM), blažilna območja itd.
- Predstavitev strukture in funkcije naravnih in sonaravnih ekosistemov (vodni, kopenski, mokrišča) ter procesov degradacije
- Stari in novi procesi obnove okolja (revitalizacija, renaturacije, restavracija itd.) ter vloga posameznih naravnih in antropogenih dejavnikov ter njihove povezave v ekoremediacijskih procesih
- Možnosti uporabe ERM v praksi:
  - sonaravna obnova in zaščita vodnega in obvodnega okolja (vodotokov, talnice, jezer in drugih stoječih voda, melioracijskih jarkov, vodozbirnih področij, področij za ohranjanje narave);
  - recikliranje ali kondicioniranje vode z ERM za različne namene;
  - rastlinske čistilne naprave;
  - fitoremediacije za čiščenje zemlje;

**Contents (Syllabus outline):**

The syllabus consists of five chapters:

- Presentation of basic terms: remediation, bioremediation, fitoremediation,.ecoremediation (ERM), tampon zones etc.
- Presentation of structure and function of natural, and anthropogenically influenced ecosystems (water-, terrestrial-, wetland habitats), and of degradation processes.
- Old-fashioned and modern renewal processes of environment (revitalization, renaturation, restoration etc.), and the role of selected natural and anthropogenic factors as well as their relations in.ecoremediation processes
- Potential use of ERM in practice:
  - sustainable renewal and protection of water and water-adjacent environment (current water flow, phreatic water, sea, ponds etc., drainage systems, water-resource areas, nature protection areas);
  - water recycling and conditioning with ERM for different purposes;
  - plant cleaning stations;

- blažilna območja (npr. za kmetijstvo in promet);
- sonaravna sanacija in rekultivacija odlagališč odpadkov;
- kombinacije z drugimi načini zaščite okolja
- Stanje in perspektive v Sloveniji in svetu

- phytoremediations for cleaning soils;
- tampon zones (used e.g. in agrarian landscapes, and in traffic);
- sustainable sanation nad recultivation of landfills;
- combination with other types of environmental protection
- State and perspectives in Slovenia and in the World

#### Temeljni študijski viri / Textbooks:

- Mueller, B., 2001: Phytotechnology Technical and Regulatory Guidance Document. Interstate Technology and Regulatory Cooperation (ITRC) Work Group. Phytotechnologies Work Team. Washington.
- Schnoor, J. L., 1997: Phytoremediation, GWRTAC, Pittsburg.

#### Dodatni priporočeni / Additionally recommended:

- Baker, K. H; D.S. HERSON, 1994: Bioremediation. McGraw-Hill. New York.
- **Franko, M. (ed.), 2001: Bioremediation and Phytoremediation of Organic Pollutants and Nutrients, International Short-Course Series The international Institute for Rural and Environmental Health and The Nova Gorica Polytechnic. Nova Gorica.**
- Projektne dokumentacije in poročila o izvedenih delih v knjižnici podjetja LIMNOS d.o.o.
- Baker, A. J. M. (ed.): International Journal of Phytoremediation. AEHS – The Association for Environmental Health and Science ([www.aehs.com](http://www.aehs.com))

#### Cilji:

- Spoznavanje strukture in funkcije ekosistemov in možnosti njune uporabe za zaščito in obnovo okolja
- Poznavanje večnamenske uporabe ekoremediacij
- Poznavanje prednosti in pomanjkljivosti ERM
- Spoznavanje starih načinov ekoremediacij ter njihovega prenosa v sedanost za preprečevanje oz. odpravljanje posledic onesnaževanja

#### Objectives:

- Learning of structure and function of ecosystems, and their potential use in protection and renewal of environments
- Learning of different use of remediations
- Learning of advantages and deficiencies of ERM.
- Learning of traditional ways of ERM and their recent use in preventing effects of environmental pollution, and in avoiding them

#### Predvideni študijski rezultati:

- Poznavanje in razumevanje osnovnih pojmov
- Razumevanja zgradbe in delovanja ekosistemov
- Poznavanje procesov degradacije
- Razumevanje delovanja ERM
- Poznavanje različnih tipov ERM in možnosti njihove uporabe

#### Prenesljive/ključne spretnosti in drugi atributi:

- Študent usvoji koncept možnosti uporabe naravnih procesov in sistemov za zaščito in obnovo degradiranega okolja

#### Intended learning outcomes:

- Knowledge and understanding of basic terms
- Understanding of structure and function of ecosystems
- Knowledge of degradation processes
- Understanding functioning of ERM
- Knowledge of different types of ERM and their use

#### Transferable/Key Skills and other attributes:

- Student get skills of using the concept of natural processes and systems in protecting and renewal of degraded environment

#### Metode poučevanja in učenja:

- Predavanja
- Seminar: demonstracija na konkretnih primerih s področja limnologije
- Usmerjene diskusije

#### Learning and teaching methods:

- Lectures
- Seminar: Demonstration of limnological study cases
- Directional discussion

#### Načini ocenjevanja:

Delež (v %) /

#### Assessment:

Weight (in %)

|  |                     |   |
|--|---------------------|---|
| <ul style="list-style-type: none"> <li>• Seminarska naloga</li> <li>• Ustni izpit</li> </ul> | <p>20</p> <p>80</p> | <ul style="list-style-type: none"> <li>• Seminar essay</li> <li>• Oral examination</li> </ul> |
|--|---------------------|---|

**Materialni pogoji za izvedbo predmeta :**

- *Multimedijska predavalnica*

**Material conditions for subject realization**

- *Lecture hall for multimedia presentations*

**Obveznosti študentov:**

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

- Seminarska naloga
- Ustni izpit

**Students' commitments:**

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

- Seminar essay
- Oral examination