



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz ekologije morja
Course title:	Selected topics in marine ecology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja		1. ali 2.; 1st or 2nd	1.- 4.; 1st-4th
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type: Izbirni/Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
25			5		150	6

Nosilec predmeta / Lecturer: Lovrenc LIPEJ

Jeziki / Predavanja / Lectures: slovenski / Slovene  
Languages: Vaje / Tutorial: slovenski / Slovene

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

Poznavanje organizmov in ekologije na ravni univerzitetnega programa

**Prerequisites:**

Knowledge of organisms and ecology at graduate level.

**Vsebina:**

Izbrana poglavja se nanašajo na aktualne vsebine iz ekologije morja.

1. abiotski in biotski dejavniki, ki vplivajo na raznolikost življenj v morju
2. bioinvazija in tropikalizacija Sredozemskega morja
3. prostorska heterogenost in morska Biodiverziteteta
4. biokonstrukcija in bioerozija v morskem

**Content (Syllabus outline):**

Selected chapters are dealing with actual topics of marine ecology.

1. Impact of abiotic and biotic factors on the marine biodiversity
2. bioinvasion & tropicalisation of the Mediterranean sea
3. spatial heterogeneity and marine Biodiversity
4. biocostruction & bioerosion in marine

okolju

5. koralni grebeni in umetni podvodni grebeni  
6. bentoška bionomija Jadranskega morja s posebnim poudarkom na ogroženih biocenozah

environment

5. coral reefs and artificial reefs  
6. benthic bionomy of the Adriatic Sea with special regard to the endangered biocoenoses

#### Temeljni literatura in viri / Readings:

- LIPEJ, L., TURK, R., MAKOVEC, T. 2006. *Ogrožene vrste in habitatni tipi v slovenskem morju = Endangered species and habitat types in the Slovenian sea*. Ljubljana: Zavod RS za varstvo narave, 264 str.
- NYBAKKEN, J. W. 1997. *Marine Biology: An Ecological Approach*. 4th Edition. Addison-Wesley Educational Publ. Inc., 481 pp.
- PERES, J-M., GAMULIN BRIDA, H. 1973. *Biološka oceanografija*. Bentos. Bentoška bionomija Jadranskog mora. Školska knjiga, Zagreb, 493 str.
- P. CASTRO & HUBER, M.E., 2016: *Marine Biology*, 10. izdaja. McRaw Hill Education, New York

#### Cilji in kompetence:

- podrobno seznaniti slušatelje z abiotičnimi in biotičnimi dejavniki, ki narekujejo razporeditev živih organizmov v obrežnem pasu  
- podrobno seznaniti slušatelje z vplivom zgodovinskih in sodobnih dogodkov na biodiverzitetu v morju (lessepska selitev, tropikalizacija, masovna izumiranje, mesinska kriza, epizodični pojavi)  
- podrobno seznaniti slušatelje z osnovami morske biogeografije s posebnim poudarkom na bentoški bionomiji Jadranskega in Sredozemskega morja  
- podrobno seznaniti slušatelje z ekološkimi procesi biokonstrukcije in bioerozije  
- podrobno seznaniti študente s sodobnimi pristopi in tehnikami raziskovanja morske ekologije

#### Objectives and competences:

- to give advanced overview of the ecological (abiotic & biotic) factors which are structuring the zonation of living organisms in littoral stage  
- to explain in detail the historical and recent events in marine realm from the aspect biodiversity (Lessepsian migration, tropicalisation, global extinctions, episodic events, Messinian crisis)  
- to give advanced overview on the marine biogeography with special emphasis to benthic bionomy of the Adriatic and Mediterranean seas  
- to explain in detail the ecological processes of bioconstruction and bioerosion  
- to present in detail the modern approaches and techniques for the study of marine ecology

#### Predvideni študijski rezultati:

#### Intended learning outcomes:

**Znanje in razumevanje:**

- dobro poznavanje zonacije obrežnega morja
- dobro poznavanje ekoloških dejavnikov, ki vplivajo na raznolikost življenja v morju
- dobro razumevanje sodobnih procesov, s katerimi se danes soočata Jadransko in Sredozemsko morje
- dobro poznavanje principov morske biogeografije in bentoške bionomije
- dobro poznavanje procesov, povezanih s klimatskimi in oceanografskimi spremembami

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

- podrobno prepoznavanje obrežnih pasov,
- dobro razumevanje vpliva ekoloških dejavnikov na procese v morju
- dobro razumevanje globalnih oceanografskih in podnebnih sprememb in njihov vpliv na živi svet morja
- dobro poznavanje sodobnih vzorčevalnih pristopov in tehnik

**Knowledge and understanding:**

- advanced knowledge of zonation of the the coastal sea
- advanced knowledge of ecological factors, which are having impact on the marine biodiversity
- advanced knowledge of recent processes, which are known to affect the biodiversity of the Adriatic and Mediterranean Seas
- advanced knowledge of principles of marine biogeography and benthic bionomy
- advanced knowledge of global climate and oceanographic changes in amrine realm

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

- advanced recognition of zonation in marine organisms,
- capability to understand the impact of ecological factors on processes in the marine realm,
- capability of advance recognition of global and climate changes and their effects on living marine organisms
- advanced knowledge on modern sampling approaches and techniques

**Metode poučevanja in učenja:**

- predavanja
- laboratorijske vaje
- terenske vaje

**Learning and teaching methods:**

- lectures
- laboratory excersises
- field excercises

Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

- seminarska naloga
- ustni izpit

30/70

- seminar essay
- oral exam

**Reference nosilca / Lecturer's references:**

**Lipej, L., M. Kovačić & J. Dulčić (2022):** An Analysis of Adriatic Ichthyofauna—Ecology, Zoogeography, and Conservation Status. *Fishes*, *Fishes* 2022, 7, 58.

<https://doi.org/10.3390/fishes7020058>

**Pitacco, V., B. Mavrič & L. Lipej (2023):** A preliminary study of soft bottom benthic communities in an area affected by intense maritime traffic (Slovenian Sea, Northern Adriatic). *Marine Pollution Bulletin* [doi.org/10.1016/j.marpolbul.2023.114672](https://doi.org/10.1016/j.marpolbul.2023.114672)

**Lipej, L., D. Ivajnšič, V. Pitacco, D. Trkov, B. Mavrič & M. Orlando Bonaca (2023):** Coastal Fish Fauna in the *Cystoseira s.l.* Algal Belts: Experiences from the Northern Adriatic Sea. *J. Mar. Sci. Eng.* **2023**, 11(5), 888; <https://doi.org/10.3390/jmse11050888>

**Ivajnsič, D., M. Orlando-Bonaca, D. Donša, V. J. Grujić, D. Trkov, B. Mavrič, L. Lipej (2022):** Evaluating Seagrass Meadow Dynamics by Integrating Field-Based and Remote Sensing Techniques. *Plants* **2022**, 11, 1196. <https://doi.org/10.3390/plants11091196>

**Orlando Bonaca, M., V. Pitacco & L. Lipej (2021):** Loss of canopy-forming algal richness and coverage in the northern Adriatic Sea. *Ecological Indicators*, **V. 125**, June 2021, 107501