



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: slovenščina / Slovene
Languages: Vaje / Tutorial: slovenščina / 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 teh Adriatic Sea with special regard to the endangered biocoenoses

Temeljni literatura in viri / Readings:

Pérès, J.-M., & Gamulin-Brida, H. (1973). Biološka oceanografija: bentos, bentoska bionomija Jadranskog mora (str. XVI, 493 , 3 f. pril.). Školska knjiga.

Dodatna literatura:

Lipej, L., Turk, R., & Makovec, T. (2006). Ogrožene vrste in habitatni tipi v slovenskem morju = Endangered species and habitat types in the Slovenian sea (str. 264). Zavod RS za varstvo narave.
Nybakken, J. W., & Bertness, M. D. (2005). Marine biology: an ecological approach (6th ed., [International ed.], str. XI, 579). Pearson/Benjamin Cummings.
Danovaro, R., & Snelgrove, P. V. R. (2024). Marine biology: comparative ecology of planet ocean (str. XXI, 698). John Wiley & Sons.

Cilji in kompetence:

- podrobno seznaniti slušatelje z abiotskimi in biotskimi dejavniki, ki narekujejo razporeditev živih organizmov v obrežnem pasu
- podrobno seznaniti slušatelje z vplivom historičnih in recentnih dogajanj na biodiverzitetu v morju (Isepska selitev, tropikalizacija, masovna izumiranja, mesinska kriza, epizodični pojavi)
- podrobno seznaniti slušatelje z osnovami morske biogeografije s posebnim poudarkom na bentoško bionomijo Jadranskega in Sredozemskega morja
- podrobno seznaniti slušatelje z ekološkimi procesi biokonstrukcije in bioerozije
- podrobno seznaniti študente s sodobnimi pristopi in tehnikami raziskovanja morské 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:

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Seminarska naloga	30	Seminar paper
Ustni izpit	70	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* <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.*, 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*, 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, 107501