

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Ihtiologija z ribiško biologijo
Course title:	Ichthyology and Fisheries

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Ekotehnologije, 3. stopnja	/	1	1
Ecotechnologies, 3 rd cycle	/	1	1

Vrsta predmeta / Course type Izbirni / Elective

Univerzitetna koda predmeta / University course code: EKO3-748

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
15	15			15	105	5

**Navedena porazdelitev ur velja, če je vpisanih vsaj 15 študentov. Drugače se obseg izvedbe kontaktnih ur sorazmerno zmanjša in prenese v samostojno delo. / This distribution of hours is valid if at least 15 students are enrolled. Otherwise the contact hours are linearly reduced and transferred to individual work.*

Nosilec predmeta / Lecturer: Prof. dr. Lovrenc Lipej

Jeziki / Predavanja / Lectures: slovenski/angleški - Slovene/English
Languages:

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

Zaključena druga stopnja bolonjskega študija program s področja naravoslovja, tehnologije ali tehnike.

Prerequisites:

Completed Bologna second level degree in natural sciences, technology or engineering.

Vsebina:

Ihtiologija z ribiško biologijo

- Definicija. Zgodovina raziskovanja.
- Metode in tehnike v ihtiologiji. Podvodno vzorčenje rib. Tehnike nedestruktivnih metod popisovanja. Vzorčenje endolitskih in kriptobentoških vrst. Vzorčenje rib hrustančnic.
- Osnove zunanje morfologije in anatomije rib. Biometrija in meristika. Metode določevanja.
- Življenjske strategije. Razmnoževalna ekologija. Spolni dimorfizem. Spolni polimorfizem. K vs r strategija. Protiplenilske strategije.
- Prehranjevalna ekologija. Generalisti vs

Content (Syllabus outline):

Ichthyology and fisheries biology

- Definition. History of ichthyological research.
- Methods & techniques in ichthyology. SCUBA methods in ichthyology. Non-destructive visual techniques. Sampling of endolithic & cryptobenthic species. Sampling of cartilaginous fishes.
- Basic external fish morphology and anatomy. Biometry and meristics. Identification methods.
- Life strategies. Reproductive ecology. Sexual dimorphism and polymorphism. K vs r strategy.
- Feeding ecology. Generalist vs specialists.

specialisti. Metode raziskovanja prehrane. Trofični nivoji.

- Zakaj toliko vrst rib na svetu? Zoogeografski pregled. Endemizem. Ekološke skupine rib. Kriptobentoške vrste. Endolitske vrste.
- Cehi. Ribe kot ekološki indikatorji.
- Osnove ribiške biologije. Ribji resursi. Trajnostni ribolov. Gojenje rib.

Techniques in diet research. Trophic levels.

- Why are there so many fish species? Fish zoogeography. Endemism.
- Ecological groups of fishes. Cryptobenthic species. Endolithic species.
- Fish guilds. Fish as ecological indicators.
- An introduction to fisheries biology. Fish living resources. Sustainable fisheries. Aquaculture.

Temeljni literatura in viri / Readings:

Izbrana poglavja iz naslednjih knjig: / Selected chapters from the following books:

Helfman, G.S. 2007. Fish Conservation: A Guide to Understanding and Restoring Global Aquatic Biodiversity and Fishery Resources. Island Press. Washington, USA.

Lipej, L., Orlando-Bonaca, M., Makovec, T. 2009. Jadranske babice. MBP-NIB Monografije.

Tyus, H.M. 2011. Ecology and Conservation of Fishes. CRC Press, Boca Raton, USA

strokovni prispevki o tovrstni tematiki iz Jadranskega morja / scientific papers related to this topic in the Adriatic and Mediterranean areas

Cilji in kompetence:

Predmet ponuja možnosti bazičnega znanja o ihtiologiji kot pomembni biološki disciplini s posebnim poudarkom na ribiško biologijo kot neposredno aplikacijo ihtiologije. Slušatelji dobijo uvid v temeljna spoznanja o biologiji in ekologiji rib in metode raziskovanja. Poseben poudarek je novejšim metodam vzorčenja kot so npr. tehnike nedestruktivnega vzorčenja, ki je uporaben na nivoju zavarovanih območij.

Objectives and competences:

This course offers the basic knowledge on ichthyology as a special biological scientific discipline with special remark on fisheries biology as a direct application of ichthyology. Students will achieve basic information on the biology and ecology of fishes and scientific methods, as well. Special attention is paid to the recently discovered techniques for sampling such as non-destructive techniques, which are suitable for studying marine protected areas.

Predvideni študijski rezultati:

- slušatelj bo poznal osnovne biologije in ekologije rib,
- znal bo uporabiti osnovna vzorčevalna orodja,
- seznanil se bo z uporabo mednarodno standardiziranih tehnik vzorčenja s posebnim poudarkom na biometriji in meristiki,
- znal bo determinirati vrste,
- znal bo izolirati otolite in spoznal metode njihove uporabe,
- znal bo uporabljati mednarodne baze podatkov (fishbase, WormS).

Intended learning outcomes:

- Acquainting knowledge on the general fish biology and ecology,
- Acquainting skills on field sampling and laboratory work
- Acquainting skills on internationally standardized techniques with special regards on biometry and meristics,
- Acquainting skills on fish identification
- Acquainting skills on otolith isolation and use in fish biology
- Acquainting knowledge how to use international data bases (fishbase, WormS)

Metode poučevanja in učenja:

Terensko delo, predavanja, seminar, konzultacije

Learning and teaching methods:

Field work, lectures, seminar, consultation

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Seminarska naloga

50 %

Seminar work

Ustni zagovor seminarske naloge

50 %

Oral defense of seminar work

Reference nosilca / Lecturer's references:

- HORVAT, M., DEGENEK, N., LIPEJ, L., SNOJ TRATNIK, J., FAGANELI, J. (2014). Trophic transfer and accumulation of mercury in ray species in coastal waters affected by historic mercury mining (Gulf of Trieste, northern Adriatic Sea). *Environmental science and pollution research international*, 21, 6, 4163-4176. <http://dx.doi.org/10.1007/s11356-013-2262-0>, doi: [10.1007/s11356-013-2262-0](https://doi.org/10.1007/s11356-013-2262-0). [COBISS.SI-ID [2981199](https://www.cobiss.si/id/2981199)]
- LIPEJ, L., MAVRIČ, B., ODORICO, R., KOCE, U. (2016). The diet of the Mediterranean shag *Phalacrocorax aristotelis desmarestii* roosting along the Slovenian coast. *Acrocephalus* 37, 170/171, 151-158.
- PITACCO, V., LIPEJ, L., MAVRIČ, B., MISTRI, M., MUNARI, C. (2017). Comparison of benthic indices for the evaluation of ecological status of three Slovenian transitional water bodies (northern Adriatic). *Marine pollution bulletin* [v tisku], <http://www.sciencedirect.com/science/article/pii/S0025326X17309311>, doi: [10.1016/j.marpolbul.2017.10.085](https://doi.org/10.1016/j.marpolbul.2017.10.085).
- AZZURRO, E., BOLOGNINI, L., DRAGIČEVIČ, B., DRAKULOVIC, D., DULČIĆ, J., FANELLI, E., GRATI, F., KOLITARI, J., LIPEJ, L., MAGALETTI, E., MARKOVIĆ, O., MATIĆ-SKOKO, S., MAVRIČ, B., MILONE, N., JOKSIMOVIĆ, A., TOMANIĆ, J., SCARPATO, A., TUTMAN, P., VRDOLJAK, D., ZAPPACOSTA, F. (2018). Detecting the occurrence of indigenous and non-indigenous megafauna through fishermen knowledge : a complementary tool to coastal and port surveys. *Marine pollution bulletin*, [in press], doi: [10.1016/j.marpolbul.2018.01.016](https://doi.org/10.1016/j.marpolbul.2018.01.016).
- FAGANELI, J., FALNOGA, I., HORVAT, M., KLUN, K., LIPEJ, L., MAZEJ, D. (2018). Selenium and mercury interactions in apex predators from the Gulf of Trieste (Northern Adriatic Sea). *Nutrients*, 10, 3, 278-1-278-11, doi:[10.3390/nu10030278](https://doi.org/10.3390/nu10030278)