Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Osnove ekologije
Course title:	Fundamentals in Ecology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna biologija 1. stopnja		**3.**	**5**
Educational biology 1st level		**3.**	**5**

Vrsta predmeta / Course type	Obvezni / Obligatory
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30			**15**	**15**	**120**	**6**

Nosilec predmeta / Lecturer:	Nina Šajna

Jeziki / Languages:	**Predavanja / Lectures:**	**Slovenščina/ Slovenian**
	Vaje / Tutorial:	**Slovenščina/ Slovenian**

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Jih ni.	None.

Vsebina:

- Uvod v ekologijo, definicije
- Organizmi kot odprti kibernetski sistemi
- Organizmi in fizično okolje
- Ekofiziologija (prilagoditve in odzivi organizmov na dejavnike okolja)
- Pregled okoljskih dejavnikov Svetloba Toplota Voda
- Kompleksno delovanje okoljskih dejavnikov
- Populacijska ekologija (struktura in rast populacij, življenjski cikli, demografija)
- Združbe in lastnosti združb, intra- in interspecifična razmerja: plenilstvo, herbivorija, kompeticija, disturbanca, stres, sukcesije
- Ekosistemi, biomi in ekosfera
- Ekosistemski procesi

Content (Syllabus outline):

- Introduction into ecology, definitions
- Organisms as open kybernetic systems
- Organisms and physical environment
- Ecophysiology (adaptations and organismic response to environmental factors)
- An overview of environmental factors Light Heat Water
- Complex functioning of the environmental factors
- Population ecology (structure and growth of populations, life histories, plant demography)
- Communities and community properties, intra- and interspecific relationships: predation, herbivory, competition, disturbance, stress, successions
- Ecosystems, biomes, Earth ecosystem
- Ecosystem processes

Temeljni literatura in viri / Readings:

- Begon, M., Towsend C.R., Harper J.L., 2006: Ecology: From Individuals to Ecosystems. John Wiley & Sons.
- Cain M.L., Bowman W.D., Hacker S.D., 2014: Ecology. Sinauer Associates.
- Chapin, F. S., P. A. Matson & H. A. Mooney, 2002: Principles of terrestrial ecosystem ecology. Springer Verlag.
- Gurevitch, J., Scheiner S., Fox G: 2002: Plant ecology. Sinauer Associates Inc. Publishers.
- Nentwig, W., S. Bacher, C. Beierkuhnlein, R. Brandl & G. Grabherr, 2004: Ökologie. Spektrum Akad. Verlag.
- Stiling, P., 2002: Ecology: theories and applications. Prentice Hall.
- Tarman, K., 1992: Osnove ekologije in ekologija živali. DZS.
- Tome, D., 2007: Ekologija. TZS.

Cilji in kompetence:

Objectives and competences:

- Podati definicije v ekologiji
- Podati pregled osnovnih ekoloških zakonitosti, konceptov in teorij
- Prikazati nekatere osnovne metode ekološkega vzorčenja
- Podati pregled abiotskih in biotskih ekoloških dejavnikov
- Pregled osnovnih relacij med osebkom in okoljem
- Podati osnove populacijske ekologije rastlin
- Spodbujati zanimanje za ekološke raziskave in usposabljanje za načrtovanje takšnih raziskav
- Podati pregled biomov Zemlje, Evrope in Slovenije

- To give definitions in ecology
- To give a review of the basic ecological laws, concepts and theories
- To present selected sampling methods in ecology
- To give a review of abiotic and biotic environmental factors
- To give a review of the basic relations between the individual and its environment
- To introduce principles of population ecology
- To increase the interest for ecological investigations and training of planning such investigations
- To introduce the overview on biomes of the Earth, Europe and Slovenia

Predvideni študijski rezultati:

Znanje in razumevanje:

- Poznavanje in razumevanje temeljnih ekoloških zakonitosti
- Razumevanje homeostaze in ekološkega ravnovesja kot osnovna biotska kibernetska mehanizma
- Poznavanje glavnih abiotskih dejavnikov
- Poznavanje glavnih biotskih dejavnikov
- Razumevanje ekoloških procesov v kontekstu globalnih sprememb
- Razumevanje lastnosti in procesov v ekosistemih
- Prepoznavanje in razumevanje ekoloških razmer v konkretnem okolju in sposobnost sodelovanja pri njihovi obravnavi
- Pregled biomov ter vegetacije Zemlje, Evrope in Slovenije

Prenesljive/ključne spretnosti in drugi atributi:

- Sposobnost razumevanja ključnih segmentov ekologije rastlin in živali
- Sposobnost izmeriti in razumeti okoljske dejavnike, ki vplivajo na osebek, populacijo in združbo

Intended learning outcomes:

Knowledge and Understanding:

- Knowledge about and understanding basic ecological principles
- Understanding of homeostasis and ecosystem dynamics as basic biotic cybernetic mechanisms
- Knowledge about common abiotic factors

Knowledge about common biotic factors

- Understanding of the ecological processes in the context of global changes
- Understanding of ecosystem properties and processes
- Recognizing and understanding of the ecological state within a concrete environment, and ability to take a part within discussing them
- An overview over the biomes and vegetation of the Earth, Europe and Slovenia

Transferable/Key Skills and other attributes:

- Ability to understand the key issues in plant and animal ecology
- Capability to measure and understand the environmental factors affecting individuals, populations and communities
- Ability in use of basic ecological methods
- Capability of preparing corresponding lists, tables and graphs

• Sposobnost uporabe osnovnih ekoloških metod • Usposobljenost za pripravo ustreznih seznamov, tabel in grafičnih analiz	

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Terenske vaje • Laboratorijske vaje	• Lectures • Field work • Laboratory work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
• Praktični kolokvij iz vaj in ustni zagovor pogoj za pristop k izpitu	50%	• Practical examination of exercises and oral discussion mandatory for final exam
• Pisni izpit	50%	• Written exam

Reference nosilca / Lecturer's references:

- ŠAJNA, Nina, KUŠAR, Primož. 2014. Modeling species fitness in competitive environments. Ecological modelling, 275, str. 31-36.
- NOVAK, Tone, ŠAJNA, Nina, ANTOLINC, Estera, LIPOVŠEK DELAKORDA, Saška, DEVETAK, Dušan, JANŽEKOVIČ, Franc. 2014. Cold tolerance in terrestrial invertebrates inhabiting subterranean habitats. International journal of speleology, 43,
- ŠAJNA, Nina, REGVAR, Marjana, KALIGARIČ, Simona, ŠKVORC, Željko, KALIGARIČ, Mitja. 2013. Germination characteristics of *Salicornia patula* Duval-Jouve, *S. emerici* Duval-Jouve, and *S. veneta* Pign. et Lausi and their occurrence in Croatia. Acta botanica Croatica, 72, 347-358.
- ŠAJNA, Nina, MEISTER, Margit H., BOLHÁR-NORDENKAMPF, Harald R., KALIGARIČ, Mitja. 2013. Response of semi-natural wet meadow to natural geogenic CO2 enrichment. International journal of agriculture and biology, 15, no. 4, str. 657-664.
- ŠAJNA, Nina, KUŠAR, Primož, SLANA NOVAK, Ljuba, NOVAK, Tone. 2011. Benefits of low-intensive grazing: co-occurrence of umbelliferous plant (*Hladnikia pastinacifolia* Rchb.) and opilionid species (*Phalangium opilio*. L) in dry, calcareous grassland. Polish journal of ecology, vol. 59, issue 4, str. 777-786