



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	<b>Sistematska zoologija</b>
<b>Course title:</b>	<b>Systematic zoology</b>

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	2	3
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type:

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
45			45		120	7

Nosilec predmeta / Lecturer:

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

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

Prerequisites:

Vsebina:

- Principi živalske sistematike
- Protozoa, praživali
- Porifera, spužve
- Cnidaria, ožigalkarji.
- Plathelminthes, ploskavci.
- Nemertini, nitkarji
- Aschelminthes, valjevci
- Mollusca, mehkužci
- Annelida, kolobarniki.
- Arthropoda, členonožci: Chelicerata, pipalkarji, Crustacea, raki, Myriapoda, stonoge, Insecta, žuželke
- Lophophorata, lofoforati.
- Hemichordata, polstrunarji, Chordata, strunarji, Chaetognatha, ščetinočeljustnice

Content (Syllabus outline):

- Coping with animal diversity
- Protozoa
- Porifera
- Cnidarians
- Plathelminths
- Nemerteans
- Aschelminths
- Molluscs
- Annelids
- Arthropods: Chelicerates, Crustaceans, Myriapods and Insects
- Lophophorates.
- Hemichordates, Chordates and Chaetognathes
- Echinoderms

- Echinodermata, iglokožci
- Evolucija nevretenčarjev
- Diverziteta in diagnoza vretenčarjev,
- Evolucijski nastanek strunarjev, filogenetski odnosi in adaptivna radiacija.
- Sistematika, nomenklatura in sistematski znaki.
- Funkcionalna anatomija vretenčarjev.
- Zgodnji razvoj in embriologija vretenčarjev.
- Biologija posameznih skupin vretenčarjev in njihova vloga v okolju.

- Patterns of Invertebrate Evolution
- Diversity and diagnosis of vertebrates.
- Origin of vertebrates, phylogenetic relationships and adaptive radiations.
- Systematics, nomenclature and systematic signs.
- Functional anatomy of vertebrates.
- Early development and embryology.
- Biology of vertebrate groups and their role within the environment.

### Temeljna literatura in viri / Readings:

- Brusca, R. C., G. J. Brusca, 2002: Invertebrates. 2nd ed. Sinauer, Sunderland
- Liem, K. F., W. E. Bemis, W. F. Walker, L. Grande, 2001: Functional Anatomy of the Vertebrates. An Evolutionary Perspective. Harcourt College Publishers. Orlando.
- Kardong, K. V., 2002: Vertebrates: comparative anatomy, function, evolution. McGraw-Hill Companies. New York.
- Nielsen, C. 1997: Animal Evolution. Interrelationships of the living Phyla. Oxford University Press, Oxford.
- Pough, F. H., C. M. Janis, J.B. Heiser, 2005: Vertebrate Life. Pearson Education International. New Jersey.
- Ruppert, E. E., R. D. Barnes, 2002: Invertebrate Zoology. 6th ed. Saunders College Publishing, Philadelphia, New York.
- Sket, B., M. Gogala, V. Kuštor, 2003: Živalstvo Slovenije. Tehniška založba, Ljubljana
- Storch V., U. Welsch, 2004: Systematische Zoologie. Spektrum Akademischer Verlag Heidelberg. Berlin.

### Cilji in kompetence:

- Predstaviti temeljne skupine nevretenčarjev
- Podati povezavo med gradbenim planom in načinom življenja
- Predstaviti raznolikost in kompleksnost nevretenčarjev
- Podati evolucijski pristop pri študiju nevretenčarjev
- Podati pregled sistema vretenčarjev
- Podati biotsko - ekološke značilnosti vretenčarjev
- Predstavitev evolucijskega nastanka vretenčarjev, filogenetskih odnosov in adaptivne radiacije
- Predstavitev embriološkega razvoja vretenčarjev
- Predstavitev ekomorfoloških ter funkcionalno anatomskih lastnosti
- Predstavitev metod dela in znanstvenih načel v sistematiki

### Objectives and competences:

- To present fundamental invertebrate groups
- To give the relations between animal "Bauplan" and its environment
- To present diversity and complexity of Animal Kingdom
- To give an evolutionary approach in the study of invertebrates
- To give the systematic overview of vertebrates.
- To give biotic and ecological characteristics of vertebrates.
- Introduction of evolutionary origin of vertebrates, phylogenetic relationships and adaptive radiation.
- Introduction of embryological development of vertebrates
- Introduction of ecomorphological and functional anatomical characteristics
- Introduction of methods and scientific principles in systematics.

### Predvideni študijski rezultati:

### Intended learning outcomes:

**Znanje in razumevanje:**

- Povezava med organizacijo živalskega telesa in okoljem živali
- Kompleksnost živalskih skupin
- Poznavanje biodiverzitete na svetovnem nivoju
- Razumevanje glavnih evlucijskih trendov pri živalih
- Razumevanje filogenetskih odnosov med glavnimi skupinami nevretenčarjev in vretenčarjev
- Prepoznavanje in določanje živali
- Znanja in razumevanja ekološke vloge živali v ekosistemih
- Znanja in razumevanja metod dela v sistematiki, taksonomiji in ekologiji živali
- Razumevanje evlucijskih adaptacij ter njihove funkcionalne morfološko-ekološke povezanosti
- Znanja embriološkega razvoja vretenčarjev

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

- Sposobnost načrtovati in izvesti preprosta opazovanja in eksperimente na živalih
- Sposobnost ovrednotiti rezultate poskusa
- Determinacija evropskih vretenčarjev
- Presoja in interpretacija vloge vretenčarjev v ekosistemu

Strokovno in raziskovalno delo iz ekologije in ekomorfologije vretenčarjev

**Metode poučevanja in učenja:**

- Predavanja
- Laboratorijske vaje

**Knowledge and understanding:**

- Relation between animal organisation and its environment
- Complexity of animal groups
- Knowledge of biodiversity at the global level
- Understanding of the major evolutionary trends among animals
- Understanding phylogenetic relationships among major invertebrates and vertebrates groups.
- Recognition and identification of animals.
- Knowledge and understanding of ecological role in ecosystems.
- Knowledge and understanding of methods in systematics and ecology of animals.
- Understanding of evolutionary adaptations and their functional morphological-ecological relationships.
- Knowledge of embryologic development in vertebrates.

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

- Ability to arrange simple observations and experiments with animals
- Ability to evaluate results of an experiment
- Determination of European vertebrates
- Judgement and interpretation of vertebrates role within an ecosystem
- Expert and research work in ecology and ecomorphology of vertebrates

**Learning and teaching methods:**

- Lectures
- Laboratory excersises

**Načini ocenjevanja:**

- Praktični kolokvij
- Pisni izpit

Delež (v %) /

Weight (in %)

**Assessment:**

- Practical examination
- Written exam

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

KLOKOČOVNIK, Vesna, DEVETAK, Dušan, KLENOVŠEK, Tina, PODLESNIK, Jan. Contribution to the knowledge of brown lacewings from Albania : (Neuroptera, Hemerobiidae). *Spixiana : Zeitschrift für Zoologie*, ISSN 0341-8391, 2014, bd. 37, h. 2, str. 233-237. [COBISS.SI-ID 21057800]

KLOKOČOVNIK, Vesna, PODLESNIK, Jan, DEVETAK, Dušan. Occurrence of the antlion tribe Acanthaclisini in the Balkan Peninsula : (Neuroptera, Myrmeleontidae). *Spixiana : Zeitschrift für Zoologie*, ISSN 0341-8391, 2016, bd. 39, h. 1, str. 99-104, ilustr. [COBISS.SI-ID 22594568]

DEVETAK, Dušan, KLOKOČOVNIK, Vesna. The feeding biology of adult lacewings (Neuroptera) : a review. *Trends in entomology*, ISSN 0972-4761, 2016, vol. 12, str. 29-42, ilustr. [COBISS.SI-ID 22624264]

JANŽEKVIČ, Franc, KRYŠTUFEK, Boris. Geometric morphometry of the upper molars in European wood mice *Apodemus*. *Folia Zool. (Brno)*, 2004, let. 53, št. 1, str. 47-55.