



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	EVOLUCIJA
Course title:	EVOLUTION

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
<u>Enoviti pedagoški magistrski program 2. stopnje Predmetni učitelj</u>	Izobraževalna biologija	5.	9
	Educational Biology	5	9

Vrsta predmeta / Course type:

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30					60	3

Nosilec predmeta / Lecturer:

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

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

Prerequisites:

Vsebina:

<p>I. Evolucija kot znanost</p> <ul style="list-style-type: none">• položaj evolucije v kontekstu naravoslovnih, družbenih in humanističnih znanosti;• zgodovinski razvoj evolucijske misli;• sodobni pogledi na proces evolucije; <p>II. Izvor živega</p> <ul style="list-style-type: none">• prebiotska evolucija;• teorije o nastanku živega;• veliki evolucijski prehodi;• kraljestva in domene živega; <p>III. Orodja evolucijskega biologa</p> <ul style="list-style-type: none">• paleontološki izkazi (fosili, posledice delovanja);
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Content (Syllabus outline):

<p>I. Evolution as science</p> <ul style="list-style-type: none">• evolution in the context of sciences, social sciences and humanities;• history of evolutionary thinking;• recent views on evolution; <p>II. Emergence of life</p> <ul style="list-style-type: none">• prebiotic evolution;• theories on development of life;• major evolutionary transitions;• kingdoms and domains of life; <p>III. Tools of evolutionary biologist</p> <ul style="list-style-type: none">• paleontology (fossils, traces of biological activities);
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<ul style="list-style-type: none"> • datacija najdb; • primerjalne študije (anatomske, histološke, embriološke, biokemijske, genetske); • genske analize; • kladistične analize; <p>IV. Izvori genske pestrosti</p> <ul style="list-style-type: none"> • razmerje med genomom, genotipom in fenotipom; • mutacije; • genske rekombinacije; • horizontalni genski transfer; • epigenetsko dedovanje; • populacijska genetika; <p>V. Selekcija</p> <ul style="list-style-type: none"> • dejavniki selekcije; • prijemališča selekcije; • strategije preživetja; • primeri adaptacij na okolje; • koevolucija; <p>VI. Speciacija in razvoj višjih taksonov</p> <ul style="list-style-type: none"> • opredelitev koncepta vrste (biološka, morfološka, kronološka); • reproduktivna izolacija; • speciacija (alopatrična, simpatrična, parapatrična); • razvoj višjih taksonov; • izumrtje taksona; <p>VII. Humana evolucija</p> <ul style="list-style-type: none"> • izvor in evolucija primatov; • evolucija primatskih znakov; • povezava med biološko in kulturno evolucijo; • filogenija in sistematika recentnih družin primatov; • filogenija, sistematika in biogeografija predhodnikov in sodobnikov rodu <i>Homo</i> (<i>Ardipithecus</i>, <i>Paranthropus</i>, <i>Australopithecus</i>, itd.); • filogenija, sistematika in biogeografija rodu <i>Homo</i>; • izvor, filogenija, sistematika in biogeografija vrste <i>Homo sapiens</i>; • razvoj človeških kultur; • najdbe v Sloveniji; • evolucijske perspektive vrste <i>H. sapiens</i>.

<ul style="list-style-type: none"> • datation; • comparative studies (anatomy, histology, embryology, biochemistry, genetics); • gen analyses; • cladistic analyses <p>IV. Sources of genetical variability</p> <ul style="list-style-type: none"> • relations between genome, genotype and phenotype; • mutations; • genetic recombinations; • horizontal gene transfer; • epigenetic inheritance; • population genetics <p>V. Selection</p> <ul style="list-style-type: none"> • factors of selection; • targets of selection; • survival strategies; • adaptations; • coevolution; <p>VI. Speciation and evolution of higher taxa</p> <ul style="list-style-type: none"> • species concept (biological, morphological, chronological); • reproductive isolation; • speciation (alopatric, simpatric, parapatric); • development of higher taxa; • extinction of taxa; <p>VII. Human evolution</p> <ul style="list-style-type: none"> • evolution of primates; • evolution of traits in primates; • connections between biological and cultural evolution; • phylogeny, systematics and biogeography of recent primate families; • phylogeny, systematics and biogeography of human precedesors and side branches of the human evolutionary line (<i>Ardipithecus</i>, <i>Paranthropus</i>, <i>Australopithecus</i>, <i>Paranthropus</i>, etc.); • phylogeny, systematics and biogeography of the genus <i>Homo</i>; • phylogeny, systematics and biogeography of the species <i>Homo sapiens</i>; • evolution of culture; • Slovenian findings; • evolutionary perspectives of <i>H. sapiens</i>.
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Temeljni literatura in viri / Readings:

Hopcroft, R. L. (Ed.). (2018). *The Oxford Handbook of Evolution, Biology, and Society*. Oxford University Press.

Evolution. Futuyama, Douglas J. (2017) Evolution. 4th ali 3th edition/ izdaja. Sunderland (Mass.) : Sinauer Associates,

Priporočeni viri

BAJD, Barbara (ur.). *Where did we come from? : current views on human evolution*. Ljubljana: Faculty of Education, 2010. 170 str., ilustr. ISBN 978-961-253-055-6.

Jablonka, E. in Lamb, M.J., 2009. Štiri razsežnosti evolucije. Genetska, epigenetska, vedénjska in simbolna raznolikost v zgodovini življenja. Zavod RS za šolstvo.

Mayr, E., Diamond, J. M., Simoniti, I., Weber, A., Wilkins, J. S., 2008. Filozofija evolucije. Fakulteta za družbene vede. Univerza v Ljubljani.

McGrew, W. C. 2011. Kulturni šimpanz. Razmišljanja o kulturni primatologiji. Studia Humanitatis. Ljubljana 2011.

Izbrani članki iz primarnih revij (Nature, Science, itd.)

Cilji in kompetence:

Po opravljenem kurzu bo študent-ka:

- razumel mehanizme biotske evolucije;
- razumel pomen strategij preživetja;
- sposoben utemeljiti izvor in razvoj živega na osnovi spoznanj naravoslovnih znanosti;
- prepoznati evolucijske procese v kontekstu drugih bioloških disciplin.
- posedoval znanja, ki mu bodo omogočala sodelovanje v razpravah, ki bodo vključevala evolucijo;
- sposoben utemeljiti biotsko in kulturno evolucijo;
- sposoben umestiti človeka v biološki sistem;
- sposoben opredeliti človeka kot biotsko in kulturno bitje.

Objectives and competences:

After the course a student should:

- understand mechanisms of biotic evolution;
- understand importance of survival strategies;
- be able to explain emergence and development of life on the scientific basis;
- recognize evolutionary processes in the context of other biological disciplines;
- possess knowledge for participation in discussions related to evolutionary topics;
- be able to ground biotic and cultural evolution;
- be able to place humans in a biological system;
- be able to define humans as a biological and cultural species;

Predvideni študijski rezultati:

Znanje in razumevanje:

- evolucije kot znanosti;
- procesov, ki so omogočili izvor in razvoj živega;
- uporabe orodij evolucijskega biologa;
- izvorov pestrosti
- mehanizmov selekcije;
- speciacije in razvoja višjih taksonov;
- humane evolucije.

Intended learning outcomes:

Knowledge and understanding of:

- evolution as a scientific discipline;
- processes, which allowed emergence of life;
- tools of evolutionary biologist;
- sources of variability;
- mechanisms of selection;
- speciation and development of higher taxa;
- human evolution.

Metode poučevanja in učenja:

Predavanja
Samostojno kritično preučevanje literature

Learning and teaching methods:

Lectures
Individual critical reading of the written sources.

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Pisni izpit

100 %

Written exam

Reference nosilca / Lecturer's references:

KOZEL, Peter, DELIĆ, Teo, NOVAK, Tone. *Nemaspela borkoae* sp. nov. (Opiliones: Nemastomatidae), the second species of the genus from the Dinaric Karst. European Journal of Taxonomy. 2020, vol. 717, str. 90-107, ilustr. ISSN 2118-9773. DOI: 10.5852/ejt.2020.717.1103.

KOZEL, Peter, PIPAN, Tanja, MAMMOLA, Stefano, CULVER, David C., NOVAK, Tone. Distributional dynamics of a specialized subterranean community oppose the classical understanding of the preferred subterranean habitats. Invertebrate biology. Sep. 2019, vol. 138, iss. 3, str. 1-14. ISSN 1077-8306. DOI: 10.1111/ivb.12254.

PIPAN, Tanja, CULVER, David C., PAPI, Federica, KOZEL, Peter. Partitioning diversity in subterranean invertebrates: the epikarst fauna of Slovenia. PloS one. May 2, 2018, vol. 13, iss. 5, str. 1-19, ilustr. ISSN 1932-6203. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195991>, DOI: 10.1371/journal.pone.0195991.

KOZEL, Peter, PIPAN, Tanja. Specialized aquatic subterranean communities are probably most species-rich in the thickest epikarst. Limnologia. 2020, vol. 81, str. 1-9. ISSN 0075-9511. DOI: 10.1016/j.limno.2020.125756.

NOVAK, Tone, SLANA NOVAK, Ljuba, KOZEL, Peter, SCHAIDER, Miriam, KOMPOSCH, Christian, LIPOVŠEK DELAKORDA, Saška, PODLESNIK, Jan, PAUŠIČ, Igor, RASPOTNIG, Günther. Hidden diversity within the *Nemastoma bidentatum* Roewer, 1914 complex (Opiliones: Nemastomatidae). Part I, Morphological evidence. European Journal of Taxonomy. 2021, vol. 777, str. 1-67, ilustr. ISSN 2118-9773. DOI: 10.5852/ejt.2021.777.1561.