

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Arheozoologija
Course title:	Archaeozoology

Študijski program in stopnja Study programme and level	Študijska smer oz. modul Study field or module	Letnik Academic year	Semester Semester
Primerjalni študij idej in kultur, doktorski študij 3. stopnje	Arheologija med Jadranom in Donavo	Brez letnika	/
Comparative Study of Ideas and Cultures, doctoral study 3 rd cycle	Archaeology between the Adriatic and the Danube	Not specified	/

Vrsta predmeta / Course type:

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Druge oblike študija Other forms of study	Samost. delo Individ. work	ECTS
10	10			10	150	6

Nosilec predmeta / Lecturer:

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

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

Za vključitev v delo ni posebnih pogojev. Priporočljivo je vsaj pasivno znanje nemškega, angleškega in italijanskega jezika

Prerequisites:

There are no specific prerequisites. At least a passive knowledge of German, English, and Italian is recommended.

Vsebina:

Arheozoologija se ukvarja s proučevanjem živalskih ostankov z arheoloških najdišč ter tako osvetljuje pomen živali pri prednamcih. Pogosteje naslavljane problematike so vloga lova, ribolova in živinoreje v gospodarstvu nekdanjih skupnosti, pomen posameznih vrst domačih živali kot vir mesa, maščob in drugotnih proizvodov reje, razvoj strategij upravljanja z živalmi, vidiki socialne razslojenosti in funkcionalne diferenciacije družb, negospodarska vloga živali (ljubljenčki, živali kot element mitološke sfere) in podoba nekdanjega okolja.

Content (Syllabus outline):

Archaeozoology is the study of animal remains from archaeological sites to provide information about the importance of animals to humans in the past. The list of most frequently addressed topics includes the role of hunting, fishing, and animal husbandry in the economy of past societies; the importance of individual domestic animals as sources of meat, fats, and secondary products; the development of specific husbandry strategies; aspects of social stratification and functional differentiation of past societies; the non-economic role of animals (pets, animals as

Študenti in študentke se bodo seznanili z:

1. Osnovnimi arheozoološki raziskovalnimi metodami:

- vzorčenje gradiva na terenu,
- taksonomsko in anatomsko opredeljevanje,
- prepoznavanje tafonomskih sledi (urezi, useki, ožganost, izpostavljenost vremenskim neprilikom idr.),
- ocena starosti živali ob poginu/zakolu
- zbiranje metričnih podatkov,
- prepoznavanje poškodb in patoloških tvorb,
- načini kvantifikacije najdb,
- statistična obdelava baz podatkov,
- multidisciplinarne raziskave in sodelovanje z drugimi vedami.

2. Razvojem načinov izkoriščanja in razumevanja živali s strani nekdanjih skupnosti v času od starejše kamene dobe do zgodnjega novega veka na Slovenskem z navezavami na širšo evropsko sliko.

Specifične teme bodo izbrane za vsakega študenta oz. študentko posebej, po potrebi v sodelovanju z ostalimi predavatelji in predavateljicami in mentorji in mentoricami in prilagojene njegovim/njenim raziskovalnim željam in temi doktorske disertacije. Nabor raziskovalnih tem lahko vključuje:

- Lov in ribolov: ocena pomena lova/ribolova za proučevano skupnost, prepoznavanje najbolje zastopanih vrst, njihov ekološki in gospodarski potencial, ocena starostne in spolne strukture, inovativni pristopi k taksonomskemu opredeljevanju kostnih najdb, filogenetskim študijam in paleobiogeografiji (geometrijska morfometrija, aDNA, ZooMs).
- Strategije upravljanja z domačimi živalmi: prepoznavanje gospodarskega pomena posameznih domestikativov, pomen primarnih in sekundarnih proizvodov reje, razumevanje vzrejnih strategij in naporov, vloženih v prilagajanje na razpoložljive

elements of the mythological sphere); and the paleoenvironmental picture.

Students will be introduced to the following topics:

1. Basic archaeozoological research methods:

- sampling of archaeozoological material during fieldwork,
- taxonomic and anatomical identification,
- recognition of taphonomic features (cut and chop marks, traces of fire exposure, weathering, etc.),
- evaluation of age at death,
- acquisition of metric data,
- recognition of fractures and pathological features,
- quantification of the finds,
- statistical analysis,
- multidisciplinary research and collaboration with other disciplines.

2. The evolution of the use and understanding of animals by past human societies between the Palaeolithic and the Early Modern Periods in the southeastern Alpine region with reference to the broader European context.

Specific topics will be selected for each student (in collaboration with other lecturers/mentors as appropriate) and adapted to their research interests and thesis topic. They may include:

- Hunting and fishing: evaluation of the importance of hunting/fishing for the societies studied, identification of the main game species, their ecological and economic potential, evaluation of age and sex structures in relation to hunting techniques, new approaches to taxonomic identification of bone finds, phylogenetic studies and paleobiogeography (geometric morphometrics, aDNA studies, ZooMs).
- Livestock management strategies: evaluating the economic importance of individual domestic animal species, the importance of primary and secondary products, understanding livestock management strategies, and the effort required to adapt to existing environmental

naravne danosti okolja na podlagi podatkov o vrstnem bogastvu in zastopnosti posameznih taksonov, starostnega in spolnega profila, pojavnosti najdb s patološkimi formacijami in analizami stabilnih izotopov.

- Socialna stratifikacija in funkcionalna diferenciacija prebivalstva na različnih ravneh (tj., znotraj najdišča, med najdišči, med kulturami ipd.): prehranske navade kot kazalec kompleksnosti družbe, načini analize razpršenosti arheozoološkega gradiva v prostoru, interdisciplinarni raziskovalni pristopi.
- Ne-gospodarska vloga živali: prepoznavna živalskih ostankov, ki se navezujejo na obredne prakse, proučevanje specifik v načinu deponiranja takšnih najdb, razumevanje kulturološkega ozadja izbire žrtvenih živalskih vrst/osebkov.
- Tafonomija: razumevanje načinov delovanja tafonomskih dejavnikov na arheozoološko gradivo kot predpogoj za realistično interpretacijo praks ter okoliščin, ki so privedle do oblikovanja analiziranih tafocenoz.
- Paleookolje: razumevanje potenciala posameznih taksonomskih skupin živali za ocenjevanje podobe nekdanjega okolja, pomen indikatorskih vrst, statistični pristopi k paleookoljskim študijam, tafonomija.

conditions based on knowledge of species richness and representation data, age and sex profiles, frequency of pathological features on bones/teeth, and isotope studies.

- Social stratification and functional differentiation at different levels (i.e., within site, between sites, cross-cultural differences): Dietary habits as an expression of social complexity, analyzes of the spatial distribution of archaeozoological finds, interdisciplinary research approach.
- Non-economic role of animals: recognizing animal remains in the context of ritual practices, examining the specifics of how these finds were deposited, understanding the cultural aspects of selecting sacrificial animal species/specimens.
- Taphonomy: understanding the ways in which taphonomic factors can help to understand the manipulations to which osteological material has been subjected, as a prerequisite for a realistic interpretation of the practices that produced the archaeozoological assemblage under study.
- Paleoenvironment: becoming familiar with the potential of various taxa for paleoenvironmental studies, understanding the importance of indicator species, statistical approaches to paleoenvironmental studies, taphonomy.

Temeljna literatura in viri / Readings:

- Andrič M., Tolar T., Toškan B. 2016, Okoljska arheologija in paleoekologija: palinologija, arheobotanika in arheozoolologija. Založba ZRC in Inštitut za arheologijo ZRC SAZU, Ljubljana.
- Bartosiewicz, L. 1999, Recent developments in archaeozoological research in Slovenia. Arheološki vestnik 50, 311–322.
- Lyman, R.L. 1999, Vertebrate taphonomy. Cambridge University Press, Cambridge.
- Lyman, R.L. 2008, Quantitative paleozoology. Cambridge University Press, Cambridge.
- MacKinnon, M. 2004, Production and consumption of animals in Roman Italy. Integrating the zooarchaeological and textual evidence. Journal of Roman Archaeology, Supplementary series 54, Portsmouth, Rhode Island.
- Marti-Grädel, E., S. Deschler-Erb, H. Hüster-Plogmann, J. Schibler 2003, Early evidence of economic specialization or social differentiation: a case study from the Neolithic lake shore settlement 'Arbon-Bleiche 3' (Switzerland). V/In: Behaviour behind bones. The zooarchaeology of ritual, religion, status and identity, Proceedings of the 9th conference of the International council of archaeozoology, Durham, avgust 2002, 164–176, Oxbow Books, Oxford.

- Mlekuž, D., A. Žibrat Gašparič, M. Horvat, M. Budja 2012, Houses, pots and food: the pottery from Maharski prekop in context. *Documenta praehistorica* 39, 325–338.
- O'Connor, T. 2000, *The archaeology of animal bones*. Sutton Publishing, Phoenix Mill.
- Peres, T.M. 2010, Methodological issues in zooarchaeology. V/In: VanDerwarker, A.M. in T.M Peres 2010, *Integrating zooarchaeology and paleoethnobotany: a consideration of issues, methods and cases*, 15–36, Springer, New York itd/etc.
- Rakovec, I. 1973, Razvoj kvartarne sesalske favne v Sloveniji. *Arheološki vestnik* 24, 225–270.
- Reitz, E.J., E.S. Wing 2008, *Zooarchaeology*. Cambridge manuals in archaeology, Cambridge University Press, Cambridge.
- Schmid, E. 1972, *Atlas of animal bones for prehistorians, archaeologists and quaternary geologists*. Elsevier Publishing Company, Amsterdam, London, New York.
- Toškan, B. 2013, Domače govedo v romaniziranem jugovzhodnoalpskem prostoru: arheozoološki pogled. *Keria* 15(1), 35–72.
- Toškan, B. 2018, Ritual burials of animals in the South-Eastern Alpine region from prehistory to the Middle Ages. *Quaderni friulani di archeologia* 28(1), 55–71.
- Toškan, B. 2022, Where are we now? Early Medieval archaeozoology in Slovenia: an overview. *Anthropozoologica* 57(12), 255–270.
- Zver, L., Toškan, B., Bužan, E. 2021, Phylogeny of Late Pleistocene and Holocene Bison species in Europe and North America. *Quaternary international* 595, 30–38.

Cilji in kompetence:

Študentje in študentke bodo pridobili osnovno znanje o arheozoološkem raziskovanju. Predmet bo ponudil pregled poglavitnih raziskovalnih področij, s katerimi se ukvarja arheozoologija, kakor tudi najbolj uporabljenih in nekaterih inovativnih analitičnih pristopov. ob tem bo predstavil najrelevantnejša spoznanja o odnosu človeka do živalstva v obdobjih od starejše kamene dobe do zgodnjega novega veka na območju današnje Slovenije in sosednjih regij. Bistveni poudarek pa bo sicer namenjen praktičnemu raziskovalnemu delu, ki bo študentom in študentkam omogočil neposredno spoznavanje vseh faz arheozoološkega dela od vzorčenja gradiva na terenu in taksonomskega opredeljevanja do interpretacije rezultatov.

Raziskovalne teme bodo izbrane za vsakega študenta oz. študentko posebej in prilagojene njegovim/njenim raziskovalnim željam in potrebam. Študenti in študentke, katerih glavna raziskovalna tema doktorske disertacije bodo arheozoološke raziskave, se bodo

Objectives and competences:

Students will acquire a basic knowledge of archaeozoological research. The course will provide an overview of the main topics archaeozoology deals with, the most commonly used and some of the innovative analytical approaches, as well as present the most important findings on the relationships between past human societies and the animal world for the territory of present-day Slovenia and adjacent regions between the Palaeolithic to the Early Modern Periods. The emphasis, however, will be on practical work, which will allow students to become directly acquainted with all phases of archaeozoological work, from sampling during field-work and taxonomic identification of finds and interpretation of results.

The selection of topics for individual case-studies will be individualised to meet the research interests and needs of the students. Students majoring in archaeozoology will be equipped to conduct independent archaeozoological research.

usposobili za samostojno raziskovalno delo na omenjenem področju.

Predvideni študijski rezultati:

Z opravljenimi obveznostmi pri predmetu bodo študentje in študentke razumeli pomen živali v gospodarstvu prednamcev, kakor tudi njihovo vlogo v obrednih praksah. Zavedali se bodo najpomembnejših omejitev arheozooloških raziskav v navezavi na objektivne okoliščine (tj. predvsem tafonomske izgube skozi čas) in subjektivne dejavnike (npr. napake pri vzorčenju gradiva, taksonomskem opredeljevanju najdb, neustrezno terensko dokumentacijo, suboptimalno stopnjo sodelovanja z raziskovalci in raziskovalkami drugih področij). S stalnim vzpodbujanjem k aktivnemu sodelovanju v razpravah bodo pridobili izkušnje za kritično ocenjevanje tako lastnega arheozoološkega dela, kakor tudi objavljenih študij drugih avtorjev.

Poleg navedenega bodo študentje in študentke, katerih poglavitno področje raziskovanja bo arheozoologija, pridobili izkušnje in znanje za samostojno načrtovanje in izpeljavo arheozooloških raziskav (vključno z vzorčenjem gradiva, taksonomskim opredeljevanjem, kvantifikacijo najdb, pridobitev metričnih in tafonomskih podatkov, oceno spola in starosti ob poginu/zakolu, sposobnost izbire ustreznih vzorcev za biokemijske analize [npr. aDNA, stabilni izotopi, ZooMs], statistično obdelavo večjih baz podatkov in učinkovito interpretacijo pridobljenih rezultatov). Slednjič bodo ponujena tudi navodila glede priprave rezultatov za objavo, s čemer bo študentka oz. študent pridobil znanje o vseh fazah raziskovalnega procesa. S tem bo izpolnjena zahteva za kvalificirano samostojno raziskovalno delo na področju arheozoologije.

Intended learning outcomes:

Upon completion of the course, students will be able to understand the importance of animals in the economy of past human societies as well as their role in ritual practises. At the same time, they will be aware of the most common limitations of archaeozoological research related to both objective factors (e.g., taphonomic losses over time) and subjective factors (errors in sampling, identification, poor field documentation, inadequate interdisciplinary collaboration). Through constant encouragement to participate in discussions, students will learn to critically examine their own archaeozoological work as well as published research.

In addition to the above knowledge/understanding, students specialising in archaeozoological research will be able to independently plan and conduct archaeozoological studies (including sampling, taxonomic identification, quantification, acquisition of metric and taphonomic data, assessment of sex and age at death, selection of appropriate samples for specific biochemical analyses [e.g., aDNA, stable isotopes, ZooMs], statistical analysis of large data sets, and effective interpretation of results). Guidance on publishing results will also be given to provide knowledge of all phases of research necessary for an independent archaeozoologist.

Metode poučevanja in učenja:**Oblike dela:**

- Frontalna oblika poučevanja
- Samostojno delo študentov
- e-izobraževanje

Metode (načini) dela:

- Razlaga
- Razgovor/ diskusija/debata
- Delo z besedilom
- Proučevanje primera
- Reševanje nalog
- Vključevanje gostov iz prakse

Learning and teaching methods:**Types of learning/teaching:**

- Frontal teaching
- Independent students work
- e-learning

Teaching methods:

- Explanation
- Conversation/discussion/debate
- Work with texts
- Case studies
- Solving exercises
- Inviting guests from companies

Načini ocenjevanja:Delež (v %) /
Weight (in %)**Assessment**

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment
Javni nastop ali predstavitev	10	Presentations
Končno ocenjevanje (pisni/ustni izpit)	80	Final examination (written/oral)
Drugo	10	Other

Reference nosilca / Lecturer's references:

- TOŠKAN, Borut, KOVAČ, Mateja, TOLAR, Tjaša 2022. Bioarheološke raziskave rimskodobnega grobišča Marof na Igu: antropologija, arheozoologija, arheobotanika / Bioarchaeological investigations of the Roman cemetery in Marof at Ig (Slovenia): anthropological, archaeozoological and archaeobotanical evidence. *Arheološki vestnik* 73, 281–312.
- TOŠKAN, Borut 2022. Where are we now? Early Medieval archaeozoology in Slovenia : an overview. *Anthropozoologica* 57(12), 255–270.
- JANŽEKOVIC, Franc, KLENOVŠEK, Tina, MLÍKOVSKÝ, Jiří, TOŠKAN, Borut, VELUŠČEK, Anton 2021. Eneolithic pile dwellers captured waterfowl in winter: analysis of avian bone remains from two pile dwellings in Ljubljansko barje (Slovenia). *International journal of osteoarchaeology* 31(6), 977–986.
- RAGOLIČ, Anja, TOŠKAN, Borut 2021. The master and his best friend: the role of the dog in human life and beyond in the South-Eastern Alpine region during Roman times. V/In: PIŠKIN, Evangelia (ur./ed.). 13th International Council of Archaeozoology Conference, 2018: archaeological, biological and historical approaches in archaeozoological research. Oxford: B.A.R., 111–122. BAR international series, 3028.
- TOŠKAN, Borut, RAGOLIČ, Anja 2021. L'allevamento del bestiame nella regione alpina sud-orientale tra IV e VI secolo d.C. V/In: BUORA, Maurizio, MAGNANI, Stefano, VILLA, Luca (ur./eds.). Italia settentrionale e regioni dell'arco alpino tra V e VI sec. d.C.: atti del convegno (15-17 aprile 2021). Trieste: Università di Trieste, 411–425. *Storia e archeologia*, 1.
- TOŠKAN, Borut 2020. Archaeozoological evidence from the Iron Age cemetery at Most na Soči: the Pucarjev Rob and Repelc Sites. V/In: TECCO HVALA, Sneža (ur./ed.), et al. Most na Soči: the 2000–2016 archaeological investigations on the left bank of the Idrijca. Ljubljana: ZRC SAZU, Inštitut za arheologijo: Založba ZRC, 191–220, 221–242. *Opera Instituti Archaeologici Sloveniae*, 43.