	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	**Biologija z mikrobiologijo**
Course title	**Biology with Microbiology**

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Upravljanje z okoljem/ 1. stopnja	Ni smeri študija	1. letnik	2.
Environmental Management/ 1st Cycle	No study field	1st year	2nd

Vrsta predmeta/Course type	obvezni/obligatory
Univerzitetna koda predmeta/University course code	1_UO_1_UN7

Predavanja **Lectures**	**Seminar** **Seminar**	**Sem. vaje** **Tutorial**	**Lab. vaje** **Laboratory work**	**Teren. vaje** **Field work**	**Samost. delo** **Individ. work**	**ECTS**
30			30		90	6

Nosilec predmeta/Lecturer:	izr. prof. dr. Nevenka Kregar Velikonja
Jeziki/ Languages: **Predavanja/Lectures:**	slovenski/Slovenian
Vaje/Tutorial:	slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
• Vpis v prvi letnik študijskega programa. • Študent mora pred izpitom pripraviti portfolio laboratorijskih vaj.	• A prerequisite for inclusion is enrolment in the first year of study. • Students have to successfully prepare portfolio of laboratory work before the examination.

Vsebina:	**Content (Syllabus outline):**
• *Živa in neživa narava:* biokemijska zgradba žive in nežive narave, organske in anorganske snovi. • *Zgradba celice kot osnovne enote živega:* prokarionska in evkariontska celica, rastlinska in živalska celica. • *Osnovni metabolni procesi v rastlinski in živalski celici.* • *Pretok energije in kroženje snovi v naravi:* heterotrofi in avtotrofi; kroženje snovi med litosfero,	• *Living and non-living nature:* biochemical structure of living and non-living nature, organic and inorganic substances. • *Cell as the basic unit of organisms:* prokaryotic and eukaryotic cells, plant and animal cells. • *Basic metabolic processes in plant and animal cells.* • *Energy flow and circulation of substances in nature:* heterotrophs and autotrophs; circulation of matter between the lithosphere, hydrosphere,

hidrosfero, atmosfero in biosfero, kroženje vode. • *Evolucija in biotska raznovrstnost:* teorije razvoja vrst. • *Ekologija kot temeljna biološka veda:* osnovni pojmi v ekologiji in zakonitosti ekologije (vrste, populacije, ekološka niša, habitat, biotop, biocenoza, ekosistem, biom, biosfera…), razlikovanje med ekologijo kot temeljno biološko vedo in varstvom okolja in narave ter med ekološkimi in okoljevarstvenimi problemi. • *Ekosistemi, vrste in habitati:* značilnosti habitatov v alpskem, celinskem in mediteranskem podnebju. • *Osnove mikrobiologije:* Vrste in značilnosti mikroorganizmov (bakterije, glive, virusi, paraziti, prioni), pomen mikroorganizmov za ekosisteme in kroženje snovi, patogeneza in širjenje okužb.	atmosphere and biosphere, circulation of water. • *Evolution and biodiversity*: theories of species development. • *Ecology as basic biological science*: basic concepts and principles of ecology (species, populations, ecological niche, habitat, biotop, biocenosis, ecosystem, biome, biosphere…), differentiation between ecology as basic biological science and protection of environment and nature, and between ecological and environmental problems. • *Ecosystems, species and habitats*: habitat characteristics in the Alpine, Continental and Mediterranean climates. • *Fundamentals of Microbiology*: Types and characteristics of microorganisms (bacteria, fungi, viruses, parasites, prions), the importance of microorganisms for ecosystems and the circulation of matter, pathogenesis and spread of infections.

Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature

- Boyer, R. (2005). *Temelji biokemije.* Ljubljana: Študentska založba (poglavje 1, str 5-25).
- Eržen, I., Gajšek, P., Hlastan Ribič, C., Kukec, A., Poljšak, B. in Zaletel Kragelj, L. (2010). *Zdravje in okolje: izbrana poglavja*. Maribor: Medicinska fakulteta. Dostopno na https://www.fzv.um.si/sites/default/files/2018/Zdravje_in_okolje.pdf (str. 147-204).
- Tome, D. in Vrezec, A. (2010). *Evolucija, biotska pestrost in ekologija - ekologija, učbenik*. Ljubljana: DZS. (168 strani, izbrane vsebine).
- Dragaš, A. Z. (2010). *Mikrobiologija z epidemiologijo.* Ljubljana: DZS. (str. 11-53; 133-161).

Priporočljiva literatura/Recommended literature

- Calver, M., Lymbery, A., McComb, J. in Bamford, M. (2009). *Environmental Biology.* Cambridge University Press; 1 edition.

Cilji in kompetence:	**Objectives and competences:**
Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc: • razumevanje žive in nežive narave, povezovanja in soodvisnosti vrst,	*The learning unit mainly contributes to the development of the following general and specific competences:* • understanding the living and non-living nature, association and interdependence of species,

• evidentiranje in definiranje okoljskih problemov, analizo problemov ter pripravo strokovno utemeljenih rešitev, • uporabo znanstvenih metod pri reševanju strokovnih problemov, • poznavanje in razumevanje kemijskih, fizikalnih in bioloških procesov in pojmov, • analizo in prepoznavanje dejavnikov okoljske epidemiologije, • sposobnost razumevanja vseh vidikov presoj vplivov okolja vključno z zdravjem prebivalstva, • sposobnost definicije ekosistemov, vrst in habitatov na primerih in območjih.	• recording and defining environmental problems, analyzing problems and developing expertly grounded solutions, • use of scientific methods in solving professional problems, • knowledge and understanding of chemical, physical and biological processes and concepts, • analysis and identification of environmental epidemiology factors, • ability to understand all aspects of environmental impact assessments including population health, • ability to define ecosystems, species and habitats in cases and areas,

Predvideni študijski rezultati:	Intended learning outcomes:
Študent/študentka: • opiše sestavo žive in nežive narave, zgradbi in osnovne metabolne procese v različnih organizmih, • pojasni povezanost in soodvisnost vrst ter principe kroženja snovi v naravi, • opiše evolucijo in biotsko raznovrstnost, različne ekosisteme, vrste, habitate, • opiše osnove ekologije kot temeljne biološke vede, • razvije kritičen odnos do različnih dejavnikov vpliva na okolje, • našteje vrste in značilnosti mikroorganizmov, oceni pomen mikroorganizmov za ekosisteme in kroženje snovi, • pojasni patogenezo in širjenje okužb, ki jih povzročajo mikroorganizmi.	*Students:* • describe the composition of living and non-living nature, structure and basic metabolic processes in different organisms, • explain the interconnectedness and interdependence of species and the principles of the circulation of substances in nature, • describe evolution and biodiversity, different ecosystems, species, habitats, • describe the basics of ecology as a fundamental biological science, • develop a critical attitude towards various environmental factors, • list the types and characteristics of microorganisms, effectively assess the importance of microorganisms for ecosystems and the circulation of matter, • explain the pathogenesis and spread of infections caused by microorganisms.

Metode poučevanja in učenja:	Learning and teaching methods:
• *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov), • *laboratorijske vaje:* refleksija izkušenj, praktično reševanje več tipičnih	• *lectures* with active student participation (explanation, discussion, questions, examples, problem solving), • *laboratory work:* reflection on experience, practical solving of several typical problems, discussion, feedback.

problemov, diskusija, sporočanje povratne informacije.	

Načini ocenjevanja:	Delež (v %) Weight (in %)	Assessment:
Načini: • izpit • izdelava portfolia laboratorijskih vaj Ocenjevalna lestvica: ECTS.	60 % 40 %	Types: • exam • preparation portfolio of the laboratory work Grading scheme: ECTS.