	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	**Mikrobiologija s parazitologijo in epidemiologija**
Course title	**Microbiology with Parasitology and Epidemiology**

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Fitoterapija/1. stopnja	Ni smeri študija	2.	4.
Phytotherapy/1st level	No specific field	2nd	4th

Vrsta predmeta/Course type	obvezni/obligatory

Univerzitetna koda predmeta/University course code	FIT_2_UN9

Predavanja **Lectures**	**Sem. vaje** **Tutorial**	**Kab. vaje** **Cabinet tutorial**	**Lab. vaje** **Laboratory work**	**Teren. vaje** **Field work**	**Samost. delo** **Individ. work**	**ECTS**
30	15		15		90	6

Nosilec predmeta/Lecturer:	doc. dr. Aleš Lapanje, doc. 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 drugi letnik študijskega programa. • Študent mora pred izpitom pripraviti in predstaviti seminarsko nalogo in opraviti kolokvije.	• The prerequisite for inclusion is enrolment in the second year of study. • Students have to successfully prepare and present a seminar paper before the examination and pass preliminary exams.

Vsebina:	**Content (Syllabus outline):**
• *Uvod v mikrobiologijo* (zgodovina in razvoj mikrobiologije ter pomembnejša odkritja). • *Vrste in značilnosti mikroorganizmov* (bakterije, glive, virusi, paraziti, prioni). • *Patogeneza in širjenje okužb.* • *Imunski odziv na okužbo in imunizacija.* • *Virologija* - razmnoževanje, izolacija in identifikacija virusov. • *Patogeni DNK virusi in RNK virusi ter bolezni, ki jih povzročajo.*	• *Introduction to microbiology* (history and development of microbiology and other major discoveries). • *Types and characteristics of microorganisms* (bacteria, viruses, fungi, parasites, prions). • *Pathogenesis and the spread of infections.* • *Immune response to infection and immunization.* • *Virology* - reproduction, isolation and identification of viruses.

• *Bakteriologija* – taksonomija, zgradba, genetika in metabolizem bakterij. • *Patogene* po Gramu pozitivne *bakterije* in po Gramu negativne bakterije ter bolezni, ki jih povzročajo. • *Atipične bakterije in bolezni*, ki jih povzročajo. • *Anaerobne bakterije in bolezni*, ki jih povzročajo. • *Mikologija* - značilnosti patogenih gliv, okužbe in diagnostika, dermatofiti. • *Parazitologija* - črevesni, krvni in tkivni paraziti ter medicinsko pomembni členonožci; zoonoze in parazitoze. • *Nadzor nad mikroorganizmi* - sterilizacija in dezinfekcija. • *Antibiotiki, kemoterapevtiki in protivirusna zdravila.* • *Odvzem in transport kužnin* ter *vloga medicinske sestre.* • *Bolnišnične okužbe* - pomembni povzročitelji in njihovo preprečevanje, osnove izolacij. • Okužbe dihal, prebavil, zob in obzobnega tkiva, sečil, centralnega živčnega sistema, kože in podkožja, mišic, splovil, rodil ter okužbe zaradi zmanjšane odpornosti. • Bakteriemija in sepsa. • Bolnišnične okužbe. • Prionske bolezni. • Prisotnost mikroorganizmov v okolju • Sterilizacija in dezinfekcija. • Načini gojitve mikroorganizmov. • Metode za identifikacijo mikroorganizmov.	• *Pathogenic DNA viruses and RNA viruses and diseases they cause.* • *Bacteriology* – taxonomy, structure, genetics and metabolism of the bacteria. • *Pathogenic* Gram positive *bacteria* and Gram negative bacteria, including diseases caused by them. • *Atypical bacteria and the diseases* they cause. • *Anaerobic bacteria and the diseases* they cause. • *Mycology* - characteristics of pathogenic fungi, infections and diagnostics, dermatophytes. • *Parasitology* - intestinal parasites, blood and tissue parasites, medically important arthropods; zoonoses and parasitoses. • *Control of microorganisms* - sterilization and disinfection. • *Antibiotics, chemotherapeutics and antiviral medications.* • *Taking samples and transport of contagium* and *the role of nurses.* • *Nosocomial infections* – important infectious agents and their prevention, the basics of insulation. • Infections of the respiratory organs, gastrointestinal tract, dental and periodontal infections, urinary tract, central nervous system, skin and subcutaneous tissue infections, muscle and reproductory organs infections, including infections due to the immunodeficiency. • Bacteremia and sepsis. • Nosocomial infections. • Prion diseases. • Microorganisms in the environment. • Sterilization and disinfection. • Methods of cultivating microorganisms. • Methods for identification of microorganisms.

Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature:

- Gubina, M. (ur.) in Ihan, A. (ur.). (2002). *Medicinska bakteriologija z imunologijo in mikologijo*. Ljubljana: Medicinski razgledi, Inštitut za mikrobiologijo in imunologijo, Medicinska fakulteta.

- Logar, J. (2010). *Parazitologija človeka*. Radovljica: Didakta.
- Poljak, M. (ur.) in Petrovec, M. (ur.). (2015). *Medicinska virologija*. Ljubljana: Medicinski razgledi, Inštitut za mikrobiologijo in imunologijo, Medicinska fakulteta.
- Orožen Adamič, A. in Sernec, K. (2011). *Mikrobiologija. Učbenik za farmacevtske in kozmetične tehnike.* Ljubljana: DZS.

Priporočljiva literatura/Recommended literature:

1. Dragaš, A. Z. (2010). *Mikrobiologija z epidemiologijo.* Ljubljana: DZS.
2. Gubina, M., Dolinšek, M. in Škerl, M. (1998). *Bolnišnična higiena*. Ljubljana: Univerza v Ljubljani, Medicinska fakulteta.
3. Koren, S., Avšič-Zupanc, T., Drinovec B., Marin, J. in Poljak M. (2002). *Splošna medicinska virologija*. Ljubljana: Medicinski razgledi.
4. Strelkauskas, Anthony J., Strelkauskas, J. in Moszyk-Strelkauskas, D. (2010). *Microbiology: a clinical approach.* New York: Garland Science.
5. Uzunović-Kamberović, S. (ur.). (2009). *Medicinska mikrobiologija.* Fojnica: Štamparija.
6. Vozelj, M. (2000). *Temelji imunologije*. Ljubljana: DZS.
7. Aktualni članki.

Cilji in kompetence:	**Objectives and competences:**
Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc: • usvojiti osnovno znanje o mikrobih: bakterijah, virusih, glivah in parazitih, • spoznati postopke in metode za izvajanje nadzora nad mikrobi, • spoznati dezinfekcijo in sterilizacijo predmetov ter antibiotike, • spoznati normalno mikrobno floro, patogenezo in načine širjenja kužnih mikroorganizmov in mikrobnih okužb; • spoznati prirojeno in pridobljeno imunost ter imunski odziv na okužbe in cepljenje, • spoznati izbrane mikrobe, ki povzročajo okužbe na posameznih področjih v telesu in značilnosti, ki jih tam povzročajo s poudarkom na diagnostiki teh okužb in zdravljenju, • usvojiti pomen in izvajanje postopkov bolnišnične higiene, • spoznavanje mikroorganizmov, njihov pomen za zdravega in bolnega človeka, načine odkrivanja prisotnosti in posledic delovanja mikrobov, • spoznavanje bolezenskih stanj, ki jih ti povzročajo in metode za njihovo odkrivanje in zatiranje,	*The learning unit mainly contributes to the development of the following general and specific competences:* • acquiring basic knowledge about microbes: bacteria, viruses, fungi and parasites, • getting to know the procedures and methods for implementing the control of microbes, • learning about disinfection and sterilization of objects and antibiotics, • learning about the normal microbial flora, pathogenesis and the ways how infectious microorganisms and microbial infections spread; • learning about the innate and acquired immunity and an immune response to infection and vaccination, • learning about the selected microbes, which cause infections in specific areas in the body and the characteristics that cause them there with a focus on the diagnosis and treatment of these infections, • acquiring the importance of knowledge and implementation of procedures on the hospital hygiene. • introduction to microorganisms, their significance for a healthy or a sick person, microbes' detection methods and the consequences of the active microbes, • learning about the conditions that cause

usposobljenost za pravilen odvzem kužnin in poudarek na postopkih za preprečevanje širjenja okužb. • razumevanje splošne strukture temeljne discipline (stroke) ter povezanosti z drugimi disciplinami, • pridobi kombinacijo znanja, veščin, etičnih vrednot in obnašanja za premišljeno, ustrezno, varno in strokovno ravnanje pri izvajanju fitoterapevtske metode.	microbes to grow and methods for their detection and suppression, qualifications for the proper sampling of contagia and an emphasis on procedures for preventing the spread of infections. • understanding basic structure of the fundamental discipline (expertise) and connection with other disciplines, • acquiring a combination of knowledge, skills, ethical values and behaviour for sound, appropriate, safe and professional conduct in the phytotherapy method implementation.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Študent/študentka:	***Students:***
• usvoji temeljno znanje o mikrobih (bakterije, virusi, glive in paraziti), • razume etiologijo infekcijskih bolezni, • razume pomen normalne mikrobne flore, • spozna imunski sistem in njegovo vlogo pri okužbi, • pridobi znanje o patogenih bakterijah in širjenju okužb, • pridobi znanje o patogenih virusih, • spozna osnovne značilnosti patogenih gliv, • spozna zoonoze, • seznani se z organizmi, ki povzročajo parazitarne bolezni, • spozna metode sterilizacije in dezinfekcije, • pridobi znanje o bakteriemiji in sepsi, • spozna mikrobne okužbe dihal, prebavil, sečil, okužbe kože, podkožja in mišic, meningitisov, • spozna spolno prenosljive bolezni, • usvoji veščine in znanje za pravilen odvzem in transport posameznih vrst kužnin, • usvoji metode za izdelavo in interpretacijo antibiogramov, • pridobi znanje za razumevanje mikrobioloških izvidov, • razume pomen aseptičnega dela, izolacije bolnika, dekontaminacije bolnika in okolja.	• acquire fundamental knowledge about the microbes (bacteria, viruses, fungi, and parasites), • understand the aetiology of infectious diseases, • understand the significance of a normal microbial flora, • get to know the immune system and its role during an infection, • acquire knowledge on pathogenic bacteria and the spread of infections, • acquire knowledge on pathogenic viruses, • get to know the basic characteristics of pathogenic fungi, • discover zoonoses, • acquire knowledge about the organisms that cause parasitic diseases, • familiarize themselves with methods of sterilization and disinfection, • acquire knowledge about the bacteraemia and sepsis, • learn about infections of the respiratory organs, gastrointestinal tract, urinary tract, skin and subcutaneous tissue infections, muscle and reproductive organs infections, • get to know some sexually transmitted diseases, • acquire skills and knowledge for proper sampling and transport of certain types of contagium, • acquire methods for the construction and interpretation of the antibiograms, • obtain the knowledge to understand the

	microbial test results, • understand the significance of aseptic work, the isolation and the patient's environment decontamination.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov), • *seminarske vaje*: priprava, predstavitev in uspešen zagovor seminarske naloge • *laboratorijske vaje* v mikrobiološkem laboratoriju (manjše skupine, prikaz klasičnih in osnovnih praktičnih postopkov mikrobiološke diagnostike z odvzemom vzorcev za mikrobiološke preiskave v bolnišnici, nacepitev na ustrezna gojišča ter odčitavanje rasti po ustrezni inkubaciji ter kritična ocena rezultatov).	• *lectures* with active student participation (explanation, discussion, questions, examples, problem solving); • *tutorial:* preparation, presentation and a successful defence of a seminar paper; • *laboratory work* in the microbiological laboratory (small groups, display of classic and basic practical procedures of microbiological diagnostics with the collection of samples for microbiological testing in the hospital, inoculation of contagium into the appropriate culture media and evaluating the growth after the incubation and the relevant critical assessment of results).

Načini ocenjevanja:	Delež (v %) Weight (in %)	**Assessment:**
Način: • izpit, • seminarska naloga, • kolokviji. Pogoj za opravljanje izpita so pozitivno ocenjena seminarska naloga in kolokviji. Ocenjevalna lestvica: ECTS.	60 % 20 % 20 %	Types: • exam, • seminar paper, • preliminary exams based on laboratory work The prerequisites for participation in examination are positively graded seminar paper and preliminary exams. Grading scheme: ECTS.