



UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION	
Predmet:	Klinična biokemija
Subject Title:	Clinical Biochemistry

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Splošna medicina General Medicine - EMŠP		3	5

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Klin. vaje Clin work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	15		30		30	3

Nosilec predmeta / Lecturer:

Doc. dr. Pika Meško Brguljan

Jeziki /

Predavanja / Lecture: Slovenski / Slovenian

Vaje / Tutorial: Slovenski / Slovenian

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

Prerequisites:

Vsebina:

PREDAVANJA in SEMINARJI: Uvod v klinično biokemijo, organizacija klinične biokemije in laboratorijev, zagotavljanje kakovosti, evaluacija metod v klinični biokemiji in referenčne vrednosti, testiranje ob pacientu (POCT), biološki vzorci – vrste analiznega materiala, seč in urinske preiskave, beljakovine v krvni plazmi, neproteinske dušikove spojine v krvnem serumu, lipidi in lipoproteini, motnje v presnovi ogljikovih hidratov, sladkorna bolezen: diagnostika in kontrola terapije, acidobazno ravnoesje in plinska analiza krvi, voda in elektroliti, laboratorijska endokrinologija, klinična encimologija, tumorski označevalci.

VAJE: Hematološke preiskave, urinske preiskave, določanje acidobaznega ravnoesja in elektrolitov, analitika beljakovin v serumu, določanje neproteinskih dušikovih spojin, bilirubina in drugih pomembnih metabolitov v serumu, imunološke preiskave, določanje koncentracij zdravilnih učinkovin v biološkem materialu, ogled klinično-biokemičnih laboratorijev.

Content (Syllabus outline):

LECTURES and SEMINARS: Introduction into Clinical Biochemistry, organisation of clinical biochemistry and laboratories, quality assurance, evaluation of methods in clinical biochemistry and reference values, point of care testing (POCT), biological material – variety of analytical samples, urine and urinalysis, plasma proteins, nonprotein nitrogenous compounds in serum, lipids and lipoproteins, disturbances in carbohydrate metabolism, Diabetes mellitus: diagnostics and laboratory monitoring of treatment, acid – base balance and blood gas analysis, water and electrolytes, laboratory endocrinology, clinical enzymology, tumour markers.

Laboratory work: Laboratory Hematology, urine examination, acid – base balance and electrolytes analysis, analytical techniques for protein determination, nonprotein nitrogenous compounds, bilirubin and other important metabolites in serum, immunodiagnostic procedures, therapeutic drug monitoring, visit to clinical-biochemical laboratories.

Temeljni literatura in viri / Textbooks:

- CA Burtis,, Bruns DE. Fundamentals of Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 7th ed.Elsevier Saunders, 2015.
- L Thomas. Labor und Diagnose, 6.auflage, TH – Books Verlagsgesellschaft Gmbh, Frankfurt/Main. 2005.
- LA Kaplan, AJ Pesce, Clinical Chemistry Theory, Analysis, Correlations 5th ed. Mosby Elsevier, 2010.
- LM Devlin, Textbook of biochemistry with clinical correlations. 7th edition. Wiley, 2010.
- Nessar Ahmed, Clinical Biochemistry. Oxford University Press 2011.
- William J Marshall, Stephen K Bangert, Clinical Chemistry, 6th edition,. Mosby Elsevier 2008.
- Michael L. Bishop, Edward P. Fody, Larry E. Schoeff, Clinical Chemistry: Tecniques, principles, correlations, 6th edition, Wolters Kluwer, Lippincott Williams Wilkins 2010.
- Robert L. Sunheimer, Linda Graves, Clinical Laboratory Chemistry, Pearson 2011.
- Osredkar Joško, Marc Janja, Laboratorijska medicina 1, Učbenik za študente medicine, farmacije in lab. biomedicine. UL, FF, LJ 2012.
- Martin A Crook, Clinical Biochemistry and Metabolic Medicine, 8th edition. CRC Press, 2012.

Cilji:

Predmet študenta teoretično in praktično seznani s področjem klinične biokemije. Na predavanjih in seminarjih posluša in aktivno pripravlja in predstavlja različne teme o pomembnosti klinično-biokemičnih preiskav v sodobni diagnostiki, seznani se tudi z analitiko teh preiskav.

Na vajah vrši sam, ali v skupini, nekatere analizne postopke pregleda bioloških vzorcev.

Objectives:

The subject introduces the student theoretically and practically to the area of Clinical Biochemistry. The student listens to lectures and coursework and actively prepares and presents various themes on the importance of clinical-biochemical examinations in modern diagnostics as well as analytical procedures.

In laboratory practice the student performs some analytical procedures for examinations of biological samples, either alone or in group.

Predvideni študijski rezultati:**Znanje in razumevanje:**

Študent mora zahtevano znanje in razumevanje predmeta potrditi s kolokvijem iz vaj, opravljenim seminarjem in izpitom.

Prenesljive/ključne spretnosti in drugi atributi:

Pridobljeno znanje študent koristi in prenese za razumevanje diagnostike bolezni v interni medicini, pediatriji, ginekologiji in onkologiji.

Intended learning outcomes:**Knowledge and Understanding:**

Student must confirm the demented knowledge and understanding with examination of laboratory practice, completed seminar and final examination.

Transferable/Key Skills and other attributes:

Acquired knowledge is useful for student and helpful to understand diagnostics of diseases in internal medicine, pediatrics, gynecology and oncology.

Metode poučevanja in učenja:

Predavanja in seminarji
Laboratorijske vaje

Learning and teaching methods:

Lectures and seminars
Laboratory practice

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

ŠTUDIJSKE OBVEZNOSTI ŠTUDENTOV Predavanja in seminarji so del pedagoških obveznosti študenta. Pri predavanjih je potrebna 50 % prisotnost, pri seminarjih 80 % prisotnost in pri vajah 100 % prisotnost. Prisotnost se sproti preverja. Študent mora zahtevano znanje in razumevanje predmeta potrditi s kolokvijem iz vaj, uspešno opravljenim seminarjem in izpitom. Študent mora za vsako opravljeno vajo oddati poročilo na predpisanem obrazcu. Po opravljenem sklopu vseh predvidenih vaj in oddanih poročil sledi preverjanje znanja - kolokvij, ki zajema tematiko celotnih vaj. POGOJI ZA PRISTOP K POSAMEZNEMU PREVERJANJU ZNANJA Uspešno opravljen kolokvij iz vaj in uspešno opravljen seminar sta pogoja za pristop k opravljanju izpita iz Klinične biokemije. Zahtevana prisotnost je tudi dodaten pogoj za pristop k izpitu. OBLIKE IN NAČIN PREVERJANJA IN OCENJEVANJA ZNANJA Preverjanje znanja na izpitu se izvrši pisno, če v izpitnem roku pristopijo k izpitu več kot 4 študenti ali ustno v primeru manj kot 5 študentov. KRITERIJI ZA OCENJEVANJE IN DELEŽI Končna ocena predmeta je odraz znanja: a) ocena izpita 70 % b) ocena zaključnega kolokvija 30 % DRUGE INFORMACIJE Dodatne informacije pri izpolnjevanju študijskih obveznosti so dosegljive pri asistentih in pri predstojniku katedre oz. nosilcu predmeta.	70 30	ACADEMIC OBLIGATIONS OF STUDENTS Lectures and coursework are a part of pedagogical obligations of a student. At lectures 50% attendance is required, at coursework 80% attendance is required and at laboratory practice 100% attendance is required. Attendance is checked regularly. The student must confirm the required knowledge and understanding of the subject by a partial exam in laboratory practice, successfully completed coursework and exam. The student must, for every completed laboratory practice, hand in a report on the prescribed form. After the completed set of all foreseen laboratory practice and reports that were handed in what follows is knowledge checking – a partial exam which encompasses the entire laboratory practice theme. REQUIREMENTS FOR ACCESS TO INDIVIDUAL KNOWLEDGE CHECKING Successfully completed partial exam in laboratory practice and successfully completed coursework are requirements for access to exam taking in Clinical biochemistry. The required attendance is also an additional requirement for taking the exam. FORMS AND MODE OF CHECKING AND ASSESSING KNOWLEDGE Knowledge checking during the exam is executed in a written form in case, on an examination date, more than four students are to take the exam or in an oral form in case less than five students are to take the exam. CRITERIA FOR ASSESSMENT AND SHARES The final mark of the subject is a reflection of knowledge: a) exam mark 70% b) final partial exam mark 30% OTHER PIECES OF INFORMATION Additional pieces of information regarding the fulfilment of academic obligations are available with assistants and heads of the departments or subject holders.
Reference nosilca / Lecturer's references:		

MEŠKO-BRGULJAN, Pika, TURK, Vito, CIMERMAN, Nina, BRZIN, Jože, KRIŽAJ, Igor, POPOVIČ, Tatjana. Human brain cathepsin H as a neuropeptide and bradykinin metabolizing enzyme. *Peptides*, ISSN 0196-9781. [Print ed.], 2003, vol. 24, str. 1977-1984. [COBISS.SI-ID 18072871], [JCR, SNIP, WoS do 26. 4. 2014: št. citatov (TC): 7, čistih citatov (CI): 7, normirano št. čistih citatov (NC): 3, Scopus do 13. 4. 2015: št. citatov (TC): 10, čistih citatov (CI): 10, normirano št. čistih citatov (NC): 4]

HUISMAN, Wim, MEŠKO-BRGULJAN, Pika, et al. Accreditation of medical laboratories in the European Union. *Clinical chemistry and laboratory medicine*, ISSN 1434-6621, 2007, letn. 45, št. 2, str. 268-275. [COBISS.SI-ID 22258393], [JCR, SNIP, WoS do 31. 8. 2014: št. citatov (TC): 21, čistih citatov (CI): 20, normirano št. čistih citatov (NC): 12, Scopus do 9. 3. 2015: št. citatov (TC): 26, čistih citatov (CI): 25, normirano št. čistih citatov (NC): 14]

MEŠKO-BRGULJAN, Pika. The regulation of clinical chemistry in Slovenia = Klinička kemija u Sloveniji - regulacija struke. *Biochemia medica*, ISSN 1330-0962, 2011, vol. 21, issue 1, str. 7-11. [COBISS.SI-ID 28151769], [JCR, SNIP, WoS do 5. 4. 2011: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0, Scopus do 14. 4. 2011: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0]

CIMERMAN, Nina, MEŠKO-BRGULJAN, Pika, KRAŠOVEC, Marta, ŠUŠKOVIČ, Stanislav, KOS, Janko. Serum concentration and circadian profiles of cathepsins B, H and L, and their inhibitors, stefins A and B, in asthma. *Clinica chimica acta*, ISSN 0009-8981. [Print ed.], 2001, vol. 310, str. 113-122. [COBISS.SI-ID 16176679], [JCR, SNIP, WoS do 15. 6. 2015: št. citatov (TC): 21, čistih citatov (CI): 19, normirano št. čistih citatov (NC): 12, Scopus do 15. 6. 2015: št. citatov (TC): 22, čistih citatov (CI): 21, normirano št. čistih citatov (NC): 13]

CIMERMAN, Nina, MEŠKO-BRGULJAN, Pika, KRAŠOVEC, Marta, ŠUŠKOVIČ, Stanislav, KOS, Janko. Twenty-four hour variations of cystatin C and total cysteine proteinase inhibitory activity in sera from healthy subjects. *Clinica chimica acta*, ISSN 0009-8981. [Print ed.], 2000, vol. 291, str. 89-95. [COBISS.SI-ID 14824231], [JCR, SNIP, WoS do 15. 4. 2013: št. citatov (TC): 24, čistih citatov (CI): 18, normirano št. čistih citatov (NC): 13, Scopus do 25. 5. 2013: št. citatov (TC): 27, čistih citatov (CI): 20, normirano št. čistih citatov (NC): 14]

CIMERMAN, Nina, MEŠKO-BRGULJAN, Pika, KRAŠOVEC, Marta, ŠUŠKOVIČ, Stanislav, KOS, Janko. Serum cystatin C, a potent inhibitor of cysteine proteinases, is elevated in asthmatic patients. *Clinica chimica acta*, ISSN 0009-8981. [Print ed.], 2000, vol. 300, str. 83-95. [COBISS.SI-ID 15357223], [JCR, SNIP, WoS do 16. 6. 2015: št. citatov (TC): 79, čistih citatov (CI): 73, normirano št. čistih citatov (NC): 51, Scopus do 16. 6. 2015: št. citatov (TC): 90, čistih citatov (CI): 85, normirano št. čistih citatov (NC): 60]

CIMERMAN, Nina, MEŠKO-BRGULJAN, Pika, KRAŠOVEC, Marta, ŠUŠKOVIČ, Stanislav, KOS, Janko. Circadian characteristics of cathepsins B, H, L, and stefins A and B, potential markers for disease, in normal sera. *Clinica chimica acta*, ISSN 0009-8981. [Print ed.], 1999, vol. 282, str. 211-218. [COBISS.SI-ID 14147367], [JCR, SNIP, WoS do 15. 2. 2013: št. citatov (TC): 10, čistih citatov (CI): 4, normirano št. čistih citatov (NC): 3]

TROBEC, Katja, KNEZ, Lea, MEŠKO-BRGULJAN, Pika, ČUFER, Tanja, LAINŠČAK, Mitja. Estimation of renal function in lung cancer patients. *Lung cancer*, ISSN 0169-5002. [Print ed.], 2012, vol. 76, iss. 3, str. 397-402, doi: 10.1016/j.lungcan.2011.11.016. [COBISS.SI-ID 29341145], [JCR, SNIP, Scopus do 5. 6. 2015: št. citatov (TC): 5, čistih citatov (CI): 4, normirano št. čistih citatov (NC): 2]

MARČUN, Robert, ŠUSTIĆ, Alan, MEŠKO-BRGULJAN, Pika, KADIVEC, Saša, FARKAŠ-LAINŠČAK, Jerneja, KOŠNIK, Mitja, LAINŠČAK, Mitja, et al. Cardiac biomarkers predict outcome after hospitalisation for an acute exacerbation of chronic obstructive pulmonary disease. *International journal of cardiology*, ISSN 0167-5273. [Print ed.], 2012, vol. 161, iss. 3, str. 156-159, doi: 10.1016/j.ijcard.2012.05.044. [COBISS.SI-ID 29962713], [JCR, SNIP, WoS do 4. 7. 2015: št. citatov (TC): 13, čistih citatov (CI): 13, normirano št. čistih citatov (NC): 5, Scopus do 4. 3. 2015: št. citatov (TC): 11, čistih citatov (CI): 11, normirano št. čistih citatov (NC): 4]

KOROŠEC, Peter, PETROVEC, Miroslav, LAINŠČAK, Mitja, MEŠKO-BRGULJAN, Pika, ŠILAR, Mira, KOŠNIK, Mitja. High nonspecific T lymphocyte response to the adjuvanted H1N1 vaccine in comparison to the H1N1/H3N2/B-Brisbane vaccine without adjuvant. *Scandinavian journal of immunology*, ISSN 0300-9475, 2012, vol. 76, iss. 5, str. 497-504, ilustr., doi: 10.1111/j.1365-3083.2012.02763.x. [COBISS.SI-ID 30117849], [JCR, SNIP, WoS do 5. 12. 2012: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0, Scopus do 29. 10. 2012: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0]