УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA
МЕДИЦИНСКИ ФАКУЛТЕТ
FACULTY OF MEDICINE

NEW CURRICULUM OF THE STUDY PROGRAMME OF MEDICINE 2022

CURRICULUM OF THE BOLOGNA-SYSTEM STUDY PROGRAMME OF MEDICINE

2022

YEAR 1

No.	Course unit	Semester I	Semester II	No. of hours	ISW	TH	ECTS
01	**Anatomy**	**4 + 5**	**4 + 6**	**285**	**265**	**550**	**22**
02.	**Histology and Embryology**	**2 + 4**	**2 + 4**	**180**	**170**	**350**	**14**
03.	**Cell Biology and Human Genetics**	**2 + 2**	**2 + 2**	**120**	**80**	**200**	**8**
04.	**Medical physics**	**2 + 1**		**45**	**30**	**75**	**3**
05.	**Medicine and Society (Medical Ethics and Social Medicine)**	**2 + 1**		**45**	**30**	**75**	**3**
06.	**First Aid**		**2 + 2**	**60**	**40**	**100**	**4**
07.	**Serbian Language 2**		**1 + 1**	**30**	**20**	**50**	**2**
08.	**Elective Course Unit I**	**1 + 1**		**30**	**20**	**50**	**2**
09.	**Elective Course Unit II**		**1 + 1**	**30**	**20**	**50**	**2**
Weekly workload		27	28				
Total hours of active classes				825	690	1515	
Total ECTS							60

Elective Course Unit I	Elective Course Unit II
1. Physical Principles of Contemporary Medical Techniques **2. Physical foundations of biological processes at the molecular level** **3. Ecotoxicology** **4. Fundamentals of Medicine** **5. Serbian 1**	**1. Molecular Biology and Medicine** **2. First Aid in Trauma** **3. Virtual Anatomy of the Central and Peripheral Nervous Systems** **4. Histology Methods** **5. Chemistry in Medicine**

YEAR 2

No.	Course unit	Semester III	Semester IV	No. of hours	ISW	TH	ECTS
10	**Medical Physiology**	**4 + 4**	**5 + 4**	**255**	**245**	**500**	**20**
11.	**Medical Biochemistry and Chemistry**	**3 + 3**	**3 + 4**	**195**	**130**	**325**	**13**
12.	**Medical Microbiology and Immunology**	**3 + 3**	**3 + 4**	**195**	**180**	**375**	**15**
13.	**Clinical Practicum I**	**1 + 1**	**1 + 1**	**60**	**40**	**100**	**4**
14.	**Medical Statistics**	**2 + 2**		**60**	**40**	**100**	**4**
15.	**Elective Course Unit III**	**1 + 1**		**30**	**20**	**50**	**2**
16.	**Elective Course Unit IV**		**1 + 1**	**30**	**20**	**50**	**2**
Weekly workload		28	27				
Total hours of active classes				825	705	1530	
Total ECTS							60

Elective Course Unit III	Elective Course Unit IV
1. Fundamentals of Laboratory Techniques in Studying Proteins **2. History of Medicine I** **3. Physiology of Aging and Positive Contribution to Healthy Aging** **4. Serbian - conversation** **5. Second Foreign Language**	**1. Biochemistry of Free Radicals** **2. Fundamentals of Classification and Assessment of Pain** **3. Physiology of Physical Activity** **4. Second Foreign Language** **5. Human Microbiome** **6. Microbiological Diagnostics of Central Nervous System Infections**

YEAR 3

No.	Course unit	Semester V	Semester VI	No. of hours	ISW	TH	ECTS
17	**Anatomic Pathology**	**5 + 3**	**4 + 3**	**225**	**200**	**425**	**17**
18.	**Pathophysiology**	**2 + 3**	**3 + 3**	**165**	**160**	**325**	**13**
19.	**Pharmacology with Toxicology**	**3 + 2**	**3 + 2**	**150**	**150**	**300**	**12**
20.	**Sciences in Medicine**	**1 + 1**		**30**	**20**	**50**	**2**
21.	**Medical English**	**1 + 1**		**30**	**20**	**50**	**2**
22.	**Epidemiology**	**2 + 1**		**45**	**30**	**75**	**3**
23.	**Propedeutics**		**2 + 5**	**105**	**70**	**175**	**7**
24.	**Elective Course Unit V**	**1 + 1**		**30**	**20**	**50**	**2**
25.	**Elective Course Unit VI**		**1 + 1**	**30**	**20**	**50**	**2**
Weekly workload		27	27				
Total hours of active classes				810	690	1500	
Total ECTS							60

Elective Course Unit V	Elective Course Unit VI
1. Safe Administration of Medication during Pregnancy and Breastfeeding	**1. National Drug Policy**
2. History of Medicine II	**2. Applied Epidemiology**
3. Diagnostic Methods in Pathology	**3. Pathophysiology of Aging**
	4. Oncological Pathology

YEAR 4

No.	Course unit	Semester VII	Semester VIII	No. of hours	ISW	TH	ECTS
26.	**Internal Medicine**	**5 + 7**	**5 + 8**	**375**	**300**	**675**	**27**
27.	**Infectious Diseases**	**1 + 2**	**1 + 2**	**90**	**60**	**150**	**6**
28.	**Neurology**	**1 + 1**	**2 + 2**	**90**	**60**	**150**	**6**
29.	**Psychiatry**	**1 + 1**	**1 + 2**	**75**	**50**	**125**	**5**
30.	**Dermatology**	**2 + 2**		**60**	**40**	**100**	**4**
31.	**Radiology**	**2 + 2**		**60**	**40**	**100**	**4**
32.	**Clinical Microbiology**		**1 + 1**	**30**	**20**	**50**	**2**
33.	**Nuclear Medicine**		**1 + 1**	**30**	**20**	**50**	**2**
34.	**Elective Course Unit VII**	**1 + 1**		**30**	**20**	**50**	**2**
35.	**Elective Course Unit VIII**		**1 + 1**	**30**	**20**	**50**	**2**
36.	**Class Workload:** **Clinical Practicum in Internal Medicine** **Radiology**			**90** **60**			
Weekly workload		29	29				
Total hours of active classes				1020	630	1650	
Total ECTS							60

Elective Course Unit VII	Elective Course Unit VIII
1. Ultrasound Diagnostics **2. Examination of Patients with Heart Defects** **3. Innovation in Neurological Diagnosis and Treatment** **4. Infectious Diseases and Biological Mechanisms** **5. Public Health**	**1. Community Mental Health** **2. Pandemics in Infectiology** **3. Contemporary Approaches in Diabetes Diagnosis and Treatment** **4. Abdominal Radiology** **5. Emergency States in Neurology**

YEAR 5

No.	Course unit	Semester IX	Semester X	No. of hours	ISW	TH	ECTS
37	**Surgery**	**4 + 6**	**5 + 8**	**345**	**230**	**575**	**23**
38.	**Pediatrics**	**3 + 3**	**3 + 3**	**180**	**120**	**300**	**12**
39.	**Obstetrics and Gynaecology**	**2 + 3**	**2 + 4**	**165**	**110**	**275**	**11**
40.	**Social Medicine**	**1 + 1**		**30**	**20**	**50**	**2**
41.	**Hygiene with Medical Ecology**	**2 + 1**		**45**	**30**	**75**	**3**
42.	**Physical Medicine and Rehabilitation**		**2 + 1**	**45**	**30**	**75**	**3**
43.	**Clinical Biochemistry**	**1 + 1**		**30**	**20**	**50**	**2**
44.	**Elective Course Unit IX**	**1 + 1**		**30**	**20**	**50**	**2**
45.	**Elective Course Unit X**		**1 + 1**	**30**	**20**	**50**	**2**
46.	**Class Workload:** **Clinical Practicum Surgery** **Clinical Biochemistry**			**90** **60**			
Weekly workload		30	30				
Total hours of active classes				1050	600	1650	
Total ECTS							60

Elective Course Unit IX	Elective Course Unit X
1. Acute and Emergency States in Gynaecology, Obstetrics and Perinatology **2. Clinical Toxicology** **3. Mechanical Ventilation** **4. Transport of Patients in Critical Condition**	**1. Nutrition and Health** **2. Rare Diseases in Children** **3. Trauma Surgery** **4. Minimally Invasive Surgery** **5. Maxillofacial Surgery**

YEAR 6

No.	Course unit		Semester XI	Semester XII	No. of hours	ISW	TH	ECTS
47	**Ophthalmology**		**2 + 2**		**60**	**40**	**100**	**4**
48.	**Otorhinolaryngology**		**2 + 2**		**60**	**40**	**100**	**4**
49.	**Intensive Care**		**1 + 1**		**30**	**20**	**50**	**2**
50.	**Family Medicine**		**4 + 4**		**120**	**80**	**200**	**8**
51.	**Occupational Medicine**		**1 + 1**		**30**	**20**	**50**	**2**
52.	**Medical Jurisprudence**		**2 + 1**		**45**	**30**	**75**	**3**
53.	**Oncology**		**2 + 2**		**60**	**40**	**100**	**4**
54.	**Clinical Pharmacology**		**1 + 2**		**45**	**30**	**75**	**3**
55.	**Emergency Medicine**		**1 + 2**		**45**	**30**	**75**	**3**
56.	**Geriatrics and Palliative Care**		**2 + 1**		**45**	**30**	**75**	**3**
57.	**Clinical Residence**	**Surgery**		**XII**	**100**			**4**
		Internal Medicine			**100**			**4**
		Pediatrics			**50**			**2**
		Obstetrics and Gynaecology			**50**			**2**
		Emergency Medicine			**50**			**2**
		Family Medicine			**100**			**4**
58.	**Bachelor's Thesis**			**XII**	**150**			**6**
Weekly workload			36					
Total hours of active classes					1140			
Total ECTS								60

ISW – Independent student work
TH – Total Hours

Total hours of active classes: 5670
Total ECTS 360

CHARACTERISTICS OF THE STUDY PROGRAMME OF MEDICINE

STUDY PROGRAMME OF MEDICINE							
	Active classes				ISW	Total	ECTS
Year of study (number of course units)	Course units of General Education		Applied Professional				
	L	P	L	P			
1. (9 course units)	345	420	30	30	690	1515	60
2. (7 course units)	375	390	30	30	705	1530	60
3. (9 course units)	360	285	60	105	690	1500	60
4. (10 course units)			375	645	630	1650	60
5. (9 course units)			405	645	600	1650	60
6. (10 course units)			270	420	360	1050	36
6. (Clinical residence)				450		450	24
Total hours in all course units combined (54)	1080	1095	1170	2325	3675	9345	360
∑ of hours (%)	2175 (38.3%)		3495 (61.7%)		3675	9345	360
∑ of course units (%)	22 (40.74%)		32 (59.26%)			54	
Total hours of active classes	5670				3675	9345	360
Total % of CUR	60.67%				39.33%	100%	
Electives and bachelor's thesis in ECTS	20 ECTS (elective course units) + 6 ECTS (bachelor's thesis) = 26 ECTS (7.2%)						
Educational profile	Doctor of Dental Medicine – 360 ECTS						
Type of study	Academic studies (6 years, 12 semesters)						
Value of 1 ECTS	25 hours						
Mode of study	Regular studies						
Area of study	Health and health protection						
Field of study	Health						
Field of scientific study	711. Medicine						

Legend: L (lectures); **P** (practicals); **ISW** (independent student work); **CUR** (curriculum);

FIRST YEAR

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
Study Programme of	**MEDICINE**	

Course Unit Name	**Anatomy**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	I and II	I: 4P+5L II: 4P+6L	22
Members of Staff	Dr Zdenka Krivokuća, full professor; Dr Goran Spasojević, full professor; Dr Vesna Gajanin, full professor; Dr Tatjana Bućma, associate professor; Dr Zlatan Stojanović, associate professor; Dr Igor Sladojević, associate professor; Mirjana Mršić, MD, teaching assistant; Teodora Prerad, MD, teaching assistant			

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	n/a

Goals of the Course Unit

The students are to get to know the appearance and anatomy of the human body. Future physicians are provided with an insight into the appearance, position and inter-relations of muscles, blood and lymphatic vessels, nerves, bones and internal organs of the human body.
Surface anatomy shows the relations of the internal structures according to the elements visible at the surface of the body (orientation points on the body, conventional lines, palpable osteological structures).

Learning Outcomes (knowledge acquired):

Having passed the examination, medical students will have been trained to define and describe the anatomy of the human body, to visualize it in space, and to use the suitable terminology, in order to be prepared for further attendance in preclinical, and especially clinical course units which are based on anatomy.
General anatomy: Familiarity with basic anatomical terms and general terms related to the human body and body parts.
Anatomy of the upper limb: Introduction to the bones, joints, muscles, nerves, blood and lymphatic vessels of the upper limb, as well as the topographically and clinically significant relations in the upper limb.
Anatomy of the lower limb: Introduction to the bones, joints, muscles, nerves, blood and lymphatic vessels of the lower limb, as well as the topographically and clinically significant relations in the lower limb.
Anatomy of the thorax: Introduction to the elements which comprise the chest cavity walls, elements of the upper, lower and posterior mediastinum, as well as the structures of the respiratory system.
Anatomy of the abdomen: Introduction to the elements which comprise the abdominal wall, its weak points, structures of the supramesocolic and submesocolic floor, as well as the retroperitoneal space elements, their appearance and mutual relations.
Anatomy of the pelvis: elements of the pelvic wall, muscles of the perineum, vascular and nervous elements, position and relations of the reproductive organs of both sexes, the urinal tract and the end portion of the digestive tract.
Anatomy of the head and neck: structures found in the head and neck, skeleton, joints, muscles, blood and lymphatic vessels, cranial nerves and peripheral nerves of the cervical plexus, morphology, position and relationships of organs and organ systems in the head and neck.
Anatomy of the central nervous system: Fundamentals of the appearance, division and macromorphology of the central nervous system, the exterior and interior morphology of all its major segments and the pathways connecting these structures. Fundamentals of the appearance, structure and function of the senses.

Practical classes:
Practicals, other forms of teaching, student research.
Acquisition of knowledge through the anatomical cadaver dissection method on the appearance, position and content of all body parts, organs and organ systems.
Seminar classes take place in computer rooms and discussion groups. It is related to clinical anatomy. The students can use the computer rooms to view modern technologies for displaying the human body in digital form, view and download lecture slides, and, through writing seminar papers, to learn to search available literature and present their approach to anatomy-related topics. Discussion groups serve as a forum on issues that have not been sufficiently covered in lectures and practicals.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent student work.
Midterms: Midterm 1 (Arm), Midterm 2 (CNS), Midterm 3 (Head and neck)
Partial exams in Anatomy: Partial exam 1 (Arm, leg, abdomen and pelvis), to be taken after the first (winter) semester, in the January/February exam term. Partial exam 2 (Head and neck, CNS; Thorax), to be taken after the second (summer) semester
Requirements: For Partial exam 1: To have passed Midterm 1, and for Partial exam 2: To have passed Partial exam 1 and to have passed Midterms 2 and 3
Final Exam in Anatomy: To take the exam, students have to have passed Partial exam 1 and Partial exam 2, or they can take the integral exam in anatomy upon completion of the second semester and having passed Midterms 1, 2 and 3.

Literature:

Микач М, Благотић М, Ђорђевић Љ, Теофиловски Г. Анатомија човека – Остеологија. Савремена администрација, Београд, 2004.
Илић А. Анатомија човека – горњи екстремитет. Савремена администрација, Београд, 2004.
Мрваљевић Д. Анатомија човека – доњи екстремитет. Савремена администрација, Београд, 2004.
Богдановић Д. Анатомија човека – грудни кош. Савремена администрација, Београд, 2002.
Мијач М, Драганић В, Радоњић В. Анатомија човека – Трбух и мала карлица. Савремена администрација, Београд, 2001.
Јеличић Н, Јовановић С. Анатомија човека – Глава и врат. Савремена администрација, Београд, 2005.
Илић А, Благотић М, Малобабић С, Радоњић В, Пространн М, Тошевски Ј.Анатомија централног нервног система. Савремена администрација, Београд, 2005.
Јовановић С. и сарадници. Анатомски атлас. Савремена администрација, Београд, 2004.
Драганић В, Јеличић Н, Ђорђевић Љ, Радоњић В, Пејковић Б. Анатомија човека – приручник за практичну наставу за студенте медицине. Савремена администрација, Београд, 2005.

Additional reading
Reihe D. Анатомија, 3. прерађено издање, Медицинска наклада, Загреб, 2018.
Moore KL, Dalley AF, Agur, AMR. Clinically oriented anatomy (seventh edition). Philadelphia: Lippincott Williams & Wilkins, 2014
Netter FH. Atlas anatomije čovjeka, Data STATUS
Terminologia Anatomica. 2nd ed. FIPAT.library.dal.ca. Federative International Programme for Anatomical Terminology, 2019
Чукурановић Р. Анатомија човека, Медицински факултет Ниш, 2019.

Literature for students studying in English
Moore KL, Dalley AF, Clinically Oriented Anatomy, Agur, 8 or 9 edition, Lippincott Williams & Wilkins (2017)
Clinical Neuroanatomy, Waxman S, 29edition, Lange.2020
Atlas of Human Anatomy. FH Netter, 7 edition, Elsevier,2018.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Practical test**	**18**	**100**
Midterms	**38**	**Oral exam**	**32**	
Seminar paper	**2**			

Note for the Course Unit:
knowledge of the Latin language is required
Syllabus Designer: Prof. Dr Zdenka Krivokuća

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
	UNDERGRADUATE STUDIES				
	Study Programme of	**MEDICINE**			
Course Unit Name	**Histology and Embryology**				
Type of Course Unit	**General Education**				
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**	
TO BE DESIGNATED	COMPULSORY	I and II	I: 2L+4P, II: 2L+4P	14	
Members of Staff	Prof. Dr Vesna Ljubojević; Sanja Jovičić, MD, senior teaching assistant; Maja Barudžija, MD, assistant				

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	n/a

Goals of the Course Unit

One of the Goals of the Course Unit is for students to acquire knowledge on the structural organization of cells, tissues and organs, on the fundamental principle of their integration into larger functional units, on their origin and intrauterine development. Another is for them to acquire knowledge necessary for: Recognizing and differentiating specific tissues and organs, including their ultrastructural characteristics, recognizing structures which deviate from normal morphological characteristics of the tissues and organs, differentiating individual stages in the development of the human embryo and fetus, and describing basic disorders in the development of individual organs and organ systems.

Learning Outcomes (knowledge acquired):

The students will be trained to use light microscopy to differentiate among four basic tissue types and all subtypes of tissues, and register changes that do not match preserved tissues; to use light microscopy to differentiate among all the organs covered within practical classes, show their elements which are relevant for the structure and differentiation from other organs; to view electronic microscopic images and distinguish all cell organelles. Also, they will be able to differentiate embryonic tissues and stages in the development of individual organs. After completing the classes, the student will be able to differentiate normal cell and tissue functions, along with pathological changes at the microscopic level.

Contents of the Course Unit:

Introduction to histology and embryology – histological methods, cytology, epithelial tissue, connecting tissue, muscle tissue, nerve tissue, general embryology, circulatory system, defense system, endocrine system, respiratory system, digestive system, urinary system, female reproductive system, male reproductive system, nervous system, eye and ear, skin

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars, midterms, office hours, and independent student work

Literature:

2. Лачковић В, Николић И, Тодоровић В (уредници). Основна и орална хистологија и ембриологија. Београд: Дата Статус, 2019.
3. Николић И и сарадници. Ембриологија човека: текст и атлас, 7. издање. Београд: Дата статус, 2018.
4. Николић И, Тодоровић В, Лачковић В, Ранчић Г, Бајчетић М, Љубојевић В, Јовић М, Владичић Машић Ј. Практикум и атлас из хистологије и ембриологиије. Београд: Дата статус, 2019.

Literature for students studying in English
1. Mescher AL. Junqueira basic histology: text and atlas. 16th ed. New York: McGraw-Hill Medical, 2021.
2. Gartner PE, Hiatt JL. *Concise Histology E-Book*. Elsevier Health Sciences, 2010.
3. Sadler TW. *Langman's medical embryology*. Lippincott Williams & Wilkins, 2018.
4. Power Point presentations and teaching material

Examination Form:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	3-8	Practical	12-20	100
Midterm(s)	15-30	Oral exam	21-40	
Seminar paper	0-2			
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Vesna Ljubojević				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	UNDERGRADUATE STUDIES			
	Study Programme of	**MEDICINE**		
Course Unit Name	**Cell Biology and Human Genetics**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	I and II	I: 2L+2P II: 2L+2P	8
Members of Staff	Dr Stojko Vidović, full professor; Dr Ljiljana Amidžić, assistant professor; Dr Vanja Vidović, assistant professor; Dr Irina Milovac, senior teaching assistant			

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

Cell biology represents the foundation for all other course units which study morphology, anatomy, histology, physiology, biochemistry, genetics, evolution and ecology of the living organism. The goal of this course unit is to introduce students with the major structural and ultrastructural characteristics of acellular life forms (viruses, prions and viroids), prokaryotic cells (bacteria and cyanobacteria), eukaryotic cells (fungi, algae, animal and plant cells), and their interrelations and the relations which the cell establishes with its surroundings. The course unit provides basic knowledge on cell functions, as well as the functions of cell organelles.

It is the goal of classes in human genetics for the students to acquire basic knowledge on the molecular foundation of heredity, the laws of inheritance and variability of traits in humans, with a special focus on induced changes in genetic material (mutations) in light of present-day knowledge in the field. Students are guided towards an interdisciplinary approach to observing healthy and diseased persons, so that they can apply their knowledge in all disciplines of medicine during their studies.

Learning Outcomes (knowledge acquired):

The students will acquire basic knowledge of prokaryotic and eukaryotic cells and the major molecules which can be found in living organisms, and of the connection between molecular structures and biological functions. Students will be able to describe and apply methods that will be used in cell research, and then to make assessments and plans for studying the cell and its structures using microscopic methods through creating cytohistological slides, proving the chemical composition of the cell using methods, and getting to know cell ultrastructure by analyzing cytochemical images from electronic microscopes.

After completing the course unit of Human Genetics, the students will have acquired knowledge on the basics of molecular genetics and the molecular biological techniques applied in medicine, which will be helpful in overcoming other biomedical course units and enable them to apply these techniques in research.

The students will have gotten to know the basic genetic terminology, inheritance rules, frequent genetic disorders, as well as analysis of family trees, enabling them to describe, assess and apply the acquired knowledge in human genetics to both clinical course units and their medical practice.

Contents of the Course Unit:

Cells biology; Cell research methods; Cell evolution. Chemical composition of the cell: water, ions, elements, carbohydrates, lipids, nucleic acids and proteins. The structure of acellular life forms (viruses, prions and viroids). Organization of a prokaryotic cell (bacteria and cyanobacteria). Organization of a eukaryotic cell (animals and plants). Structure and role of membranes, membrane transport. Structure and role of the cytoskeleton, centrioles, cilia and flagella, the endoplasmic reticulum, the Golgi body. The structure and role of the lysosome, peroxisome, mitochondria. Glycolysis and cellular respiration, enzymes. The structure and role of the ribosome and cell nucleus. Chromosomes. Cell cycle. Cell death. Medical cytology.
Human genetics: Organization of the human genome. Genetical basics of reproduction, fertilization. Structure and role of DNA, RNA, chromatin. DNA replication. Flow of genetic information from DNA to polypeptides (transcription, genetic code, translation). DNA recombination mechanisms. Numerical and structural chromosomal aberrations and syndromes. Gene mutations. DNA molecule reparation. Gene expression regulation. Molecular basics of human diseases: Mendelian and non-Mendelian inheritance, genetic polymorphism, monogenetic and oligogenic human diseases. Genetic counselling and prevention of hereditary disorders. Basic methods of molecular genetics (recombinant DNA technology, chain polymerization method, hybridization tests, sequencing) and their application in medicine. Genetical basics of sex differentiation in humans (sex chromosomes, inactivation of the X chromosome, genetical basics of personality disorders). Oncogenetics: protooncogenes and tumor-suppressing genes. Genetical basics of the immune response: immunoglobulin genes, HLA, MHC. Personalized medicine, genetic markers. Genetic structure of human populations.

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars, midterms, office hours, and independent student work.

Literature:

1. Ћелија - структуре и облици: Шербан Н. М. Завод за уџбенике и наставна средства, Београд.
2. Биологија ћелије: Пантић Р. В. Универзитет у Београду, Београд.
3. Биологија са хуманом генетиком: Диклић В., Косановић М., Дукић С., Николиш Ј. Медицински факултет, Београд.
4. Stanica: molekularni pristup: Cooper G. M., Hausman R. E. Medicinska naklada, Zagreb.
5. Molecular biology of the cell: Alberts B., Bray D., Lewis J., Raff M., Roberts K., Watson J. D. Garland Publishing, New York.
6. Хумана генетика, ауторизована скрипта: Р. Паповић, Љ. Луковић, И. Новаковић, М. Станић, В. Буњевачки, С. Цвјетићанин, О. Стојковић. Медицински факултет, Београд.
7. Хумана генетика: М. Кулић, З. Станимировић, Н. Ћелић, М. Новаковић. Универзитет у Источном Сарајеву.
8. Практикум за биологију са хуманом генетиком: М. Новаковић, С. Видовић. Медицински факултет Универзитета у Бањој Луци.
9. Молекуларна биологија: Д.С. Павићевић и Г. Матић. Београд.
   Увод у генетичко инжењерство и биотехнологију. Л. Појскић и сар. ИНГЕБ, Сарајево.

Literature for students studying in English

10. Molecular biology of the cell: Alberts B., Bray D., Lewis J., Raff M., Roberts K., Watson J. D. Garland Publishing, New York.
11. Genes VII. B. Lewin, Oxford University Press Inc., New York.
12. Cell Biology- Stephen R. Bolsover, John Wiley & Sons, Inc., Hoboken, New Jersey.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**4**	**Oral / Written**	**50**	**100**
Midterm(s)	**25**			
Seminar paper / Practical	**21**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Stojko Vidović

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of	MEDICINE

Course Unit Name	Medical physics			
Type of Course Unit	General Education			
Course Unit Code	Course Unit Status	Semester	Class Workload	Number of ECTS
	COMPULSORY	I	2L+1P (45)	3
Members of Staff	Assistant professor Goran Kolarević, dr. sc Dražan Jaroš			

Eligibility Requirements	Form of Requirements
There are no requirements for registration, attendance and examination	

Goals of the Course Unit

Acquisition of knowledge on biophysical basics of physical appearances and physical and chemical processes that take place in biological systems, which is required for further study.

Learning Outcomes (knowledge acquired):

The student acquires knowledge in mechanics, molecular physics, thermodynamics, electricity, magnetism, optics, atomic and nuclear physics applied to biological systems.
After completing the course unit, students will be capable of solving medical and biophysical problems. They will be able to solve problems which are applied to biological systems, and ultimately measure the basic physical parameters of biological systems.

Contents of the Course Unit:

The human organism as a system.
Biomechanics of the human locomotory system
Biomechanics of the cardiovascular system
Thermodynamics of the human organism
Transport processes in the human organism
Bioelectrical processes in the human organism
Bioacoustics
Light in medicine – physics of the eye and its application
Biomagnetism
Atomic physics
Nuclear physics and nuclear medicine

Teaching Methods:

Theoretical classes and laboratory practicals. Seminars and office hours

Literature:

1. Paul Davidovits. Physics in Biology and Medicine 5th Edition. Academic Press, 2018.
2. Irving P. Herman. Physics of the Human Body. Springer, 2016.
3. Muhammed Maqbool. An Introduction to Medical Physics. Springer, 2017.
4. J Šetrajčić, D Mirjanić. Biofizičke osnove tehnike i medicine. ANURS, Banja Luka, 2012.
5. D Ristanović, J Simonović, J Vuković, R Radovanović. Biofizika. Medicinska knjiga Beograd, 1981.
6. S Stanković. Fizika ljudskog organizma. PMF Novi Sad, 2006.
7. N. Milosevic, M.Platisa , D.Zikic , N.Rajkovic, Biophysics in Radiology and Nuclear Medicine, Libri Medicorum, Medicinski fakultet Univerziteta u Beogradu, CIBID, Beograd, 2016.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	10	Oral / Written	50	100
Midterms	40			
Seminar paper				

Note for the Course Unit:

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Medicine and Society**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	Compulsory	I	2L+1P	3
Members of Staff	Dr Živana Gavrić, full professor (social medicine), Dr Stela Stojisavljević, assistant professor (social medicine), Dr Goran Stojanović, associate professor (medical ethics)			

Eligibility Requirements	**Form of Requirements**
n/a	

Goals of the Course Unit

The course unit comprises two parts: social medicine and medical ethics. The goal of the first part is to introduce the students with the subject of study in social medicine (public health), focusing on the promotion (improvement) of the health of the population, ethics of public health, rights in legislation on health care both nationally and in EU countries.

The goal of the second part is to introduce the students with the basic notions of moral philosophy, recent theories of normative ethics, and its application in medical practice. Special emphasis is placed on the classical problems of medical ethics, but also on present-day moral dilemmas caused by rapid scientific and technological advancements.

Learning Outcomes (knowledge acquired):

Having passed the examination, the students will have been trained to take part in the health care process. They will have adopted the notion of public health and its ethical code, the functioning of health care for the purpose of improving the health of the population, and patient rights and safety.

They will have been able to understand the fundamental notions of ethics, and understand how ethics explains and formalizes moral human activity in medical practice. The students will have been introduced with the basic problems of medical ethics, and its main codes and declarations.

Contents of the Course Unit:

The first part studies social medicine (public health) and its promotion, the general notions of health care and deontology, the public health care code of ethics, the national and EU health care legislation, and international treaties which ensure the patients' safety and rights.

The second part studies the basic psycho-sociological factors of the moral phenomenon, follows the historical development of medical ethics and the emergence of the present-day bioethics. Special emphasis is placed on classical moral dilemmas of medical practice, the physician-patient relationship, and the challenges of present-day bioengineering.

Teaching Methods:

The lessons are given through frontal lectures, while interaction is achieved through solving specific examples from medical practice, as well debating on controversial ethical issues. The final grade is derived by adding the points earned at the first and second part of the course unit.

Literature:

1. European Commission: *Public Health*, (доступно: http://ec.europa.eu/health/index_en.htm)
2. *Izvještaj Svjetske zdravstvene organizacije* (WHO) iz oblasti socijalne medicine.
3. *Health promotion and public health*. WHO, 2018.
4. Turza, Karel. *Uvod u medicinsku etiku*, Beograd: CIBID, 2008.
5. Pens, Gregori. *Klasični slučajevi iz medicinske etike*, Beograd: Službeni glasnik, 2007.

Literature for students studying in English

1. Jennie Naidoo and Jane Wills. Foundation for Health Promotion. Third edition. Bailliere Tindall Elsevier. 2 2009.
2. WHO guidelines on ethical issues in public health surveillance. WHO. 2017.
3. Stapleton G, Schröder-Bäck P, Laaser U, Meershoek A, Popa D. Global health ethics: an introduction to prominent theories and relevant topics. *Glob Health Action*. 2014
4. Michael, Dune; Hope, *Tony. Medical Ethics: A Very Short Introduction*. Oxford Universet Press, 2018.
5. Pance, Gregory. *Classic Cases in Medical Ethics*. McGraw-Hill, 2003.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	Part I **Social Medicine**	**25**	**100**
Midterm(s)	**40**	Part II **Medical Ethics**	**25**	
Seminar paper	**-**			

Note for the Course Unit:

n/a

Syllabus Designer:

prof. Dr Živana Gavrić
prof. Dr Goran Stojanović

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**First Aid**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	COMPULSORY	II	2L+2P	4
Members of Staff	1. Prof. Dr Nada Banjac, 2. Prof. Dr Velibor Vasović, 3. Renata Hadžić, MSc, 4. Dalibor Mihajlović, MSc, 5. Darko Obradović, emerg. med. specialist, 6. Srđan Vujičić, emerg. med. specialist, 7. Snježana Kozomara, emerg. med. specialist, 8. Dragan Sladojević, emerg. med. specialist.			

Eligibility Requirements	**Form of Requirements**
n/a	/

Goals of the Course Unit

The students are to get to know the significance and purpose of first aid, to learn how to check and assess vital functions in adults and in children, and to adopt not only the practical skills of providing first aid, but also the basic theoretical knowledge for providing first aid in different emergency states, and how to properly manage the emergency state and injured patients in an emergency state. The students are to master techniques of cardiopulmonary resuscitation through the implementation of defibrillators and techniques of temporary haemostasis, types of bleeding and ways of stopping bleeding, as well as immobilization using improvised and standard supplies, and the proper transport of vitally endangered persons. Also, students should get to know the most common emergency states which are seen every day in medical practice, when it is needed to provide first aid on the spot and avoid a fatality, until the arrival of professional first aid teams.

Learning Outcomes (knowledge acquired):

Upon acquiring the theoretical knowledge on first aid, and after the student masters the application of the practical skills of providing first aid, the student will be able to independently assess the degree of urgency of the patient's condition, perform cardiopulmonary resuscitation, address all kinds of wounds, and stop external bleeding and notice signs of internal bleeding. They will be able to apply the proper immobilization and transport procedures for an injured patient by using immobilization supplies. The student will have mastered the basic procedures of taking an ECG and using an automated electrical defibrillator. In order to provide adequate first aid to persons in the most common emergency states, the student needs to get to know the basic clinical image and first aid treatment that corresponds to the given emergency state.

Contents of the Course Unit:

1. Fundamentals of first aid, its significance and goals. 2. Checking and assessing vital functions. 3. Basic cardiopulmonary resuscitation, BLS and ALS. 4. Significance of the electrocardiogram and taking an ECG reading. 5. First aid in the most common emergency states.

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work

Literature:

Прва помоћ - теорија и пракса, Проф. др Нада Бањац, 2021.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**40**			
Seminar paper				

Note for the Course Unit:

Syllabus Designer: Dr Nada Banjac, associate professor, emerg. med. specialist

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Serbian Language 2**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	II	1L + 1P	2
Members of Staff				

Eligibility Requirements	**Form of Requirements**
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Goals of the Course Unit

This course unit enables students to focus on elementary phrases, and adopt vocabulary with topics for everyday communication. They will be introduced to basic grammatical structures. The classes focus on listening, speaking, reading and writing skills for initial level.

Learning Outcomes (knowledge acquired):

Students will be able to understand elementary questions and participate in elementary conversations; focuses on short texts such as messages, notes, instructions and notices.

Contents of the Course Unit:

spelling and pronunciation: the basics of pronunciation of all phonemes of standard Serbian; Cyrillic and Latin script;
grammar: past tense, genitive and accusative – singular and plural, basic meanings and use; demonstrative pronouns; adjectives, adverbs;
vocabulary: books, nature, urban objects;
communication: introducing yourself and others; making a phone call; in the supermarket, in the municipality etc.

Teaching Methods:

Classes include the following methods: listening and watching audio and video content; reading short texts; practice student speaking skills; independent student work

Literature:

Nataša Milićević Dobromirov, Biljana Novković Adžajip
Učimo srpski 2, 2011.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**4**	**Oral / Written**	**50**	**100**
Midterms (2)	**46**			
Seminar paper				

Note for the Course Unit:

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Syllabus Designer:

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	MEDICINE			
Course Unit Name	**Physical Principles of Contemporary Medical Techniques**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	I	1L+1P	2
Members of Staff	Academician prof. Dr Dragoljub Lj. Mirjanić, full professor; Saša Nježić, MSc, senior teaching assistant			

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	

Goals of the Course Unit

The students to acquire knowledge and better understanding of complex techniques which are commonly applied in medicine.

Learning Outcomes (knowledge acquired):

The students acquire knowledge in acoustics, thermodynamics, electromagnetism, optics, atomic and nuclear physics, applied to various techniques which are used in diagnostics, rehabilitation and treatment.
Upon completion of the course unit, the student will have been capable of solving problems by implementing various techniques which are applied in various fields of medicine, and ultimately measuring basic physical parameters which are applied in medicine.

Contents of the Course Unit:

Structure of matter
Ultrasound waves
Spectroscopy
Stimulated emission of light
Electromagnetic waves in medicine
Microscopes
X-ray diagnostics
Use of radiation therapy in medicine
Physical foundations of nuclear medicine.
Physical foundations of devices for applying radiation therapy in medicine.

Teaching Methods:

Theoretical classes and laboratory practicals. Seminars and office hours

Literature:

1.Ј П Шетрајчић, Д Љ Мирјанић, Биофизичке основе технике и медицине, АНУРС, Бања Лука, 2012.
2. Ј Брњас – Краљевић, Структура материје и дијагностичке методе, Медицинска наклада, Загреб, 2001.
3. J L Prince, J M Links, Medical Imaging Signal and Systems, Pearson Prentice Hall,2006.
4. J Stanković, Osnovi radiološke fizike u radioterapiji, Fakultet za Fizičku hemiju, Beograd, 1997.
5. N. Milosevic, Platisa M, Zikic D, Rajkovic N. Biophysics in Radiology and Nuclear Medicine, Libri Medicorum, Medicinski fakultet Univerziteta u Beogradu, CIBID, Beograd, 2016.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterms	**20**			
Seminar paper	**20**			

Note for the Course Unit:

Syllabus Designer: Academician prof. Dr Dragoljub Lj. Mirjanić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Physical foundations of biological processes at the molecular level**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	I	1L+1P	2
Members of Staff	Academician prof. Dr Dragoljub Lj. Mirjanić, full professor; Saša Nježić, MSc, senior teaching assistant			

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	

Goals of the Course Unit

Acquisition of knowledge and improved understanding of processes that take place at a molecular level.

Learning Outcomes (knowledge acquired):

The student acquires knowledge in fluid mechanics and molecular thermodynamics, and gains understanding of the laws and processes that take place within a human organism.
Upon completing the course unit, the student will have been trained to apply the acquired knowledge to other areas of medicine. The student will have been capable of solving problems that take place in the human body, and ultimately measuring basic physical parameters for various processes and activities in the organism.

Contents of the Course Unit:

Fluid dynamics
Molecular transport processes
Heat and internal energy
Laws of thermodynamics
Thermodynamics and the human organism
Energy and metabolism
Effect of heat on the human organism

Teaching Methods:

Theoretical classes and laboratory practicals. Seminars and office hours

Literature:

1. J П Шетрајчић, Д Љ Мирјанић, Биофизичке основе технике и медицине, АНУРС, Бања Лука, 2012.
2. H Тодоровић, Биофизика, Медицински факултет, Нови Сад, 2015.
3. R Cotterill, Biophysics.An Introduction, Wiley, London,2006.
4. J Shapiro, Radiation protection, Harward University Press, Harvard,2002.
5. S Stanković,Fizika ljudskog organizma, PMF,Novi Sad,2006.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterms	**20**			
Seminar paper	**20**			

Note for the Course Unit:

Syllabus Designer: Academician prof. Dr Dragoljub Lj. Mirjanić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Ecotoxicology**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	I	1L+1P	2
Members of Staff	Dr med. sc. Vesna Rudić Grujić, Dr med. sc. Dragana Stojisavljević, Milkica Grabež, MSc. med., Ljiljana Stanivuk, MSc. med.			

Eligibility Requirements	**Form of Requirements**
n/a	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

Mastering knowledge and skills in ecotoxicology and cancerous materials in the living environment.

Learning Outcomes (knowledge acquired):

The students will get to know the various types of contaminants in the living environment, factors which impact toxicity (bioavailability, biotransformation, bioaccumulation and biomagnification). The students will know the basic types of biological pollution indicators (ecotoxicological biomarkers) and will be familiar with the concept of the basic types of programmes for monitoring the biological states of the living environment (biomonitoring).

Contents of the Course Unit:

The course unit is designed following a multidisciplinary approach and analyses of harmful effects of chemical materials in the ecological context. Monitoring of the living environment and biological monitoring. Global effects of contaminants: risk overview, assessment and management: Concept, examples, principle of precaution.

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work

Literature:

2. Јорга Ј. (2013). Хигијена. Београд: Медицински факултет Универзитет у Београду.
3. Васиљевић, Н. (2015). Практикум из хигијене са медицинском екологијом. Београд: Медицински факултет Универзитет у Београду.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral exam**	**50**	**100**
Midterm(s)	**20**			
Practical test	**20**			

Note for the Course Unit:

Syllabus Designer: Dr med. sc. Vesna Rudić Grujić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Serbian Language 1**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	I	1L + 1P	2
Members of Staff				

Eligibility Requirements	**Form of Requirements**
-	-

Goals of the Course Unit

This course unit enables students to focus on elementary phrases, and adopt vocabulary with topics for everyday communication. They will be introduced to basic grammatical structures. The classes focus on listening, speaking, reading and writing skills for initial level.

Learning Outcomes (knowledge acquired):

Students will be able to understand elementary questions and participate in basic conversations:
Serbian Greetings, learn how to introduce themselves in Serbian, asking for Help and Directions, Serbian Expressions and Words, use of both letters Cyrillic and Latin.

Contents of the Course Unit:

spelling and pronunciation: the basics of pronunciation of all phonemes of standard Serbian; Cyrillic and Latin script;
grammar: present tense, nominative and locative cases – singular and plural, basic meanings and use; personal, and possessive pronouns; ellementary adjectives,
vocabulary: food and drink, money and shopping, clothes, family;
communication: introducing yourself and others; in the supermarket, exchange office and restaurant, etc.

Teaching Methods:

Classes include the following methods: listening and watching audio and video content; reading short texts; practice student speaking skills;independent student work

Literature:

Nataša Milićević Dobromirov, Biljana Novković Adžajip

Učimo srpski 1, 2020.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**4**	**Oral / Written**	**50**	**100**
Midterms (2)	**46**			
Seminar paper				

Note for the Course Unit:

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Syllabus Designer:

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Fundamentals of Medicine**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	I	1L+1P	2
Members of Staff	Dr Miloš Stojiljković, full professor			

Eligibility Requirements	**Form of Requirements**
No requirements, the course unit is given in semester 1	n/a

Goals of the Course Unit

To adopt current theoretical knowledge in fundamentals of medicine, the dual character of medicine as a science and as a profession, the symbols of medicine, branches and disciplines of medicine, organization of health care services, ethical principles in medicine, organization of health care worker education and the funding options for health care services. The students should be able to acquire initial general knowledge on medicine, which they will build upon during their studies.

Learning Outcomes (knowledge acquired):

Cognitive domain – knowledge
1. Explain the notion of medicine and provide a brief historical overview of the development of this discipline. 2. List and describe the symbols of medicine (the rod of asclepius, the red cross) 3. List and describe the division of medicine as a profession to preventive, diagnostic and curative medicine. 4. List and describe the non-operative and operative branches of medicine. 5. List and explain the specificities of the education of individual health care staff, with a focus on physician education. 6. Explain the principles of funding for health care services and different types of health care insurance plans. 7. Describe and explain the primary, secondary and tertiary level of health care service provision. Psychomotor domain – skills: The course unit type is General Education.

Contents of the Course Unit:

The notion of medicine, etymology, definition; symbols of medicine; medicine as a science; medicine as a profession; preventive branches of medicine; diagnostic branches of medicine; curative branches of medicine; operative disciplines of medicine; non-operative disciplines of medicine; other disciplines of medicine; interdisciplinary fields; organization and levels of health care services; the Hippocratic Oath and aspirations of medical ethics; funding in health care and models of health insurance; organization of education in medicine and health care sciences.

Teaching Methods:

The classes are given in the form of lectures, theoretical practicals, office hours, and independent student work.

Literature:

Basic literature

1. Будак А, Грмек МД. Увод у медицину. Загреб: Глобус; 1996.
2. Турза К. Медицина и друштво: увод у медицинску етику. Београд: Медицински факултет Универзитета у Београду; 2014.

Additional reading

3. Waxman J. McLeod's Introduction to Medicine: A Doctor's Memoir. London: Springer-Verlag; 2014.

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Seminar paper	**40**			

Note for the Course Unit: Syllabus Designer: Prof. Dr Miloš Stojiljković

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE			
	UNDERGRADUATE STUDIES			
	Study Programme of	**MEDICINE**		
Course Unit Name	**Molecular Biology and Medicine**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	Elective	II	1L+1P	2
Members of Staff	Dr Stojko Vidović, full professor; Dr Vanja Vidović, assistant professor; Dr Irina Milovac, senior teaching assistant			

Eligibility Requirements	**Form of Requirements**
	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

The goal of the course unit is for the students to get to know the fundamentals of molecular biology and its significance in medicine. The students will get to know the role of the macromolecules, nucleic acids and proteins, responsible for the flow and transfer of genetic information, the basic techniques of molecular biology and their significance to the possibility of the analysis of fundamental physiological processes and risk factors for the broad spectrum of the human diseases, and the prevention of diseases. Comprehending the genetic factors of frequent diseases and the assessment of the predispositions for their incidence through the study of gene interplay and impact of the environ.

Learning Outcomes (knowledge acquired):

Having completed the course unit, the students will have acquired knowledge on the role of the genes in the incidence of multifactory human diseases. This will allow them to describe and apply the knowledge on the interaction of genetic factors and the environ in assessing the predisposition for disease incidence and comprehending the possibilities of prevention. The students will have acquired knowledge on the fundamental manner of ascertaining the frequency and distribution of specific genetic traits in our population, as well as the methods of comparing the data against other, various squares.

Contents of the Course Unit:

Getting to know the basic techniques of molecular biology and genetics in detecting and characterizing genetic markers, types of inheritance, genetic predisposition to common diseases, approaches to assessing the impact of the genetical baseline on the incidence of common diseases, genetic polymorphisms as risk factors for the incidence of common diseases, multifactory inheritance, family genes, population genes. Basic characterization of genetically predisposed diseases: Various syndromes, neurofibromatoses, mucopolysaccharidoses, dystrophias, blood disorders and other metabolopathies. Getting to know the genetic principles underlying gene therapy, understanding methods used in gene therapy, as well as the progress and achievements of gene therapy in medicine.
Practical classes: study research: Laboratory orientation, getting to know basic methods of molecular genetics at the Laboratory for Molecular Biology and Genetics at the Centre for Biomedical Research.
Seminars: During the seminars, students independently cover selected topics in the field through writing seminar papers.

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars, office hours, and independent student work.

Literature:

1. Основе молекуларне биологије: Г. Матић. Завет, Београд.
2. Молекуларна биологија 1: Д. Савић Павићевић, Г. Матић. ННК Интернационал, Београд.
3. Увод у генетичко инжењерство и биотехнологију: К. Бајровић и сар. ИНГЕБ, Сарајево.
4. Molekularna biologija u medicini: Timothy M. Cox i John Sinclair. Medicinska naklada, Zagreb.
5. Genes VII: B. Lewin. Oxford University Press Inc., New York.
6. Molecular Biology of the Cell: B. Alberts. Garland Publishing Inc., Philadelphia.
7. Genetics in Medicine: Thompson & Thompson. 8th Edition, Elsevier.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	10	Oral / Written	50	100
Seminar paper	40			
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Stojko Vidović				

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE			
	UNDERGRADUATE STUDIES			
	Study Programme of	**MEDICINE**		
Course Unit Name	**First Aid in Trauma**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	II	1L+1P	2
Members of Staff	1. Prof. Dr Nada Banjac, 2. Prof. Dr Velibor Vasović, 3. Renata Hadžić, MSc, 4. Dalibor Mihajlović, MSc, 5. Darko Obradović, emerg. med. specialist, 6. Srđan Vujičić, emerg. med. specialist, 7. Snježana Kozomara, emerg. med. specialist, 8. Dragan Sladojević, emerg. med. specialist.			

Eligibility Requirements	**Form of Requirements**
n/a	/

Goals of the Course Unit

The student is to get to know the principles of caring for the injured, to get to know proper assessment of the scene of the incident, to learn to distinguish the basic mechanisms of injury and to make proper descriptions of injuries, to get to know the criteria for assessing the severity of injuries, whether in traffic traumatism or other manners of injury occurrence, such as falling from an altitude, and expected injuries. The student is to learn to distinguish two most common forms of penetrating trauma, its occurrence mechanisms and their range, as well as the five factors involved in the occurrence of injury from explosion, and to describe the injuries during examination. The student is to get to know and learn of the standard protective measures in initial assessment of the injured, to master the elements of rapid trauma assessment and targeted assessment, and to get to know the required steps to make the proper transport decision, and to learn how to carry out a full body check, which includes vital parameters.

Learning Outcomes (knowledge acquired):

Having adopted the theoretical knowledge and practical skills, the student will be able to provide optimal first aid at the scene of the incident until the arrival of paramedics. The student will learn and train skills required to rapidly assess and examine an injured patient, initiate basic cardiopulmonary resuscitation, stabilize the injuries and make decision on the type of transport, in accordance to the degree of urgency. The student will be able to assess any danger at the scene and take the standardized protective measures which prevent complications or fatalities. The student will master the basics of the primary survey and the parameters for the assessment of critical patients that require immediate care, to prevent major loss of blood and hypovolemic shock, while monitoring vital signs, attending the wounds with bandages and immobilization.

Contents of the Course Unit:

1. Assessment of the scene of the incident
2. Examination and treatment of an injured person
3. Steps in the examination of an injured person
4. Airway in trauma
5. Treatment of the airway in trauma
6. Injuries and treatment of injuries in trauma.
7. Shock
8. Cardiopulmonary arrest in trauma
9. Standard immobilization techniques

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work

Literature:

Прва помоћ - теорија и пракса, Проф. др Нада Бањац, 2021.
Збрињавање озлијеђених особа, Међународне смјернице, John E. Campbell, Roy L. Alson, 2015

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	10	Oral / Written	50	100
Midterm(s)	40			
Seminar paper				
Note for the Course Unit:				
Syllabus Designer: Dr Nada Banjac, associate professor, emerg. med. specialist				

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
	UNDERGRADUATE STUDIES				
	Study Programme of	**MEDICINE**			
Course Unit Name	**Virtual Anatomy of the Central and Peripheral Nervous Systems**				
Type of Course Unit	**General Education**				
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**	
TO BE DESIGNATED	ELECTIVE	II	1L+1P	2	
Members of Staff	Dr Zdenka Krivokuća, full professor; dr Goran Spasojević, full professor; dr Vesna Gajanin, full professor; dr Tatjana Bućma, associate professor; dr Zlatan Stojanović, associate professor; dr Igor Sladojević, associate professor; Mirjana Mršić, MD, teaching assistant; Teodora Prerad, MD, teaching assistant				

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

Detailed study of the anatomy of the nervous system.

Learning Outcomes (knowledge acquired):

Having learned the morphology of a healthy organ, the students will be able to ascertain any possible pathological changes based on changes in the morphology, and to make good interpretations of images of the central and peripheral nervous systems, received using the visualization method, from standard X-ray imagery to imagery obtained through present-day technology (computerized axial tomography, nuclear magnetic resonance, ultrasonography and others).

Contents of the Course Unit:

Grey matter of the spinal cord and the medulla oblongata, morphology and basic anatomical organization
Grey matter of the cerebellum and mesencephalon, morphology and fundamentals of anatomical organization
White matter of the spinal cord, brain stem and cerebellum, morphology and basic anatomical organization.
Grey matter of the diencephalon, morphology and basic anatomical organization.
Cerebral cortex, morphology and basic anatomical organization.
Grey matter of the cerebellum and mesencephalon, morphology and fundamentals of anatomical organization
Anatomy of the brain vascularization zones Cerebrospinal fluid and the chamber system, morphology and basic anatomical organization.
Anatomy of the PNS and ANS
Practicals, other forms of teaching, student research
Acquisition of knowledge through the anatomical cadaver dissection method on the appearance, position and content of nervous system.
Seminar classes take place in computer rooms and discussion groups. The students can use the computer rooms to view modern technologies for displaying the nervous system in digital form, view and download lecture slides, and, through writing seminar papers, to learn to search available literature and present their approach to anatomy-related topics. Discussion groups serve as a forum on issues that have not been sufficiently covered in lectures and practicals

Teaching Methods:

Theoretical training (video presentation). Practical classes (computer and negatoscope presentation, anatomical macrodissection). Seminars (one seminar, on a topic proposed by the students, with approval of the class lecturer). Office hours (solving tests after each cycle of lectures and practicals on the individual parts of the nervous system). Pre-exam practicals. Independent student work.

Literature:

Literature on the nervous system through medical records databases (Pub Med, EBSCO, SCI index...)

Examination Form:

Pre-Exam Duties	**Final Exam**	**Total Points**

Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**---**			
Seminar paper	**40**			
Note for the Course Unit:				
knowledge of the Latin language is required				
Syllabus Designer: Prof. Dr Zdenka Krivokuća				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Histology Methods**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	Elective	II	1L+1P	2
Members of Staff	Prof. Dr Vesna Ljubojević, Prof. Dr Radoslav Gajanin			

Eligibility Requirements	**Form of Requirements**
No	

Goals of the Course Unit

The goal of the course unit is for students to acquire knowledge on the histological and cytological methods of studying cells and tissues, and to acquire knowledge on the basic principles of preparing histological slides for light microscopy by using methods of staining tissue sections, on the basics of histochemistry and immunohistochemistry. Another goal is for them to acquire basic knowledge on working in a histological laboratory, on laboratory instruments and substances, and how they are used.

Learning Outcomes (knowledge acquired):

The student will be able to independently carry out: histological and cytological methods, basic principles and stages in tissue processing and making histological slides for light microscopy, the hematoxylin-eosin staining method, and be versed in the basics of histochemistry and immunohistochemistry. The student will be able to recognize the basic instruments in a histology laboratory, and be familiar with the basic substances of the histology laboratory.

Contents of the Course Unit:

Preparing tissues for light microscope analysis, tissue fixation, general principles of preparing histological slides, principles and stages in processing tissues for routine paraffine cuts, moulding, microtome – paraffin sectioning, frozen sectioning – cryocut, hematoxylin-eosin method, histochemistry methods, immunohistochemistry methods, automatization of the laboratory process, methods of immunofluorescence, in situ hybridization, molecular diagnostic methods, electronic microscopy.

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars, office hours, and independent student work.

Literature:

1. Dey P. Basic and Advanced Laboratory Techniques in Histopathology and Cytology. Singapore: Springer, 2018.
2. Power Point presentations and class materials.
3. Suvarna SK, Layton C, Bancroft JD. Bancroft's Theory and Practice of Histological Techniques. Seventh edition. London: Churchill Livingstone Elsevier, 2013

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance (lectures and practicals)	**15-25**	**Oral exam**	**50**	**100**
Seminar papers	**15-25**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Vesna Ljubojević

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Chemistry in Medicine**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	II	1L+1P	2
Members of Staff	Prof. Dr Snežana Uletilović			

Eligibility Requirements	**Form of Requirements**
There are no requirements for registration, attendance and examination	

Goals of the Course Unit

Acquiring knowledge in fields of chemistry which are relevant to the understanding biochemistry, getting to know current topics in cell chemistry. The largest portion of the theoretical and seminar classes is dedicated to organic chemistry of the biomolecules which are relevant to processes taking place in biological systems. Acquiring knowledge on basic electrochemical processes, kinetics, energetic changes in these processes, and their application to the biological system.

Learning Outcomes (knowledge acquired):

Implementation of acquired knowledge for facilitated understanding of biochemical reactions and metabolic changes. Ability to explain underlying mechanisms for chemical reactions relevant to processes taking place within cells and knowledge of the unity of chemical processes in living and non-living matter. Seminar classes define and describe selected groups of molecules which have some biological activity or have been applied in medicine, while at the same time developing writing and speaking skills during expositions on suitable topics.

Contents of the Course Unit:

Reactivity and classification of organic compounds
Organic compounds that contain oxygen
Organic compounds that contain nitrogen and sulphur
Heterocyclic compounds
Nucleic acids, structure and various shapes of the DNA molecule

Teaching Methods:

Theoretical training, seminars and office hours.

Literature:

1. Вујовић З, Карацић И, Гопчевић К, Вујић В, Стојановић К, Крстић Д. Одабрана поглавља из Хемије за студенте медицинског факултета, Медицински факултет, 2006.
2. Трифуновић С, Сабо Т, Тодоровић З. Општа хемија, Хемијски факултет, Београд, 2014.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterms	**10**			
Seminar paper	**30**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Snežana Uletilović

SECOND YEAR

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	UNDERGRADUATE STUDIES			
	Study Programme of	**MEDICINE**		
Course Unit Name	**Medical Physiology**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	III and IV	III: 4L + 4P IV: 5L + 4P	20
Members of Staff	Prof. Dr Amela Matavulj, Prof. Dr Nenad Ponorac, Prof. Dr Zvezdana Rajkovača, Assist. prof. Dr Tanja Šobot, Zorislava Zagorac, MSc, Sonja Marinković, associate; Darko Depčinski, associate; Ines Pajić, associate; Teodora Radulović, associate.			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed. (mandatory – Anatomy, Histology and Embryology)	As provided by the Rules of Study at the integrated study programme of medicine.

Goals of the Course Unit

The goals of this course unit are for the student to apply prior knowledge in physics, chemistry. biochemistry, histology and anatomy to acquire topical knowledge and practical skills on the normal function of the human organism. The students are introduced to the basics of the functioning of the whole organism, organ systems and individual organism and tissues, with a focus on regulation mechanisms for maintaining homeostasis.

Learning Outcomes (knowledge acquired):

Having mastered the theoretical and practical subject-matter in physiology and having passed the exam, the student will be able to: Identify / note, describe and explain the most relevant characteristics of organ systems at the level of the cell, the organ and the whole human organism. Describe, distinguish and explain control mechanisms (negative and positive feedback loops) relevant to maintaining homeostasis. Name and explain changes that occur in each individual organ system as a consequence of changing parameters within and beyond physiological boundaries.

Apply the acquired knowledge to predict further function of an organ system.

Compare similarities and differences in the functioning of the different organ systems of the human organism. Use the adopted theoretical knowledge in solving problems in practice. Carry out practical measurements of selected physiological parameters and explain the obtained results.

Contents of the Course Unit:

Fundamentals of physiology. Bodily fluids. Biological membrane transports. Excitable tissue physiology. Muscle physiology. General principles of neurophysiology. Sensory function of the nervous system. Special senses. Motor function of the nervous system. Cerebral cortex, cerebellum, basal ganglia. Limbic system. Autonomous Nervous System. Thermoregulation. Heart physiology. Circulation. Urinary system physiology. Blood physiology. Breathing physiology. Digestive system. Energy metabolism, metabolic rate. Nutrition physiology. Endocrine control of metabolism, growth and energy balance. Reproductive system.

Teaching Methods:

The classes are given in the form of lectures, practicals and theoretical practicals,
midterms, office hours and independent student work.

Literature:

1. Медицинска физиологија (превод тринаестог издања). Guyton AC, Hall, Data Status, Београд, 2019.
2. Ганонгов преглед медицинске физиологије (прво издање на српском језику). Ganong William, Факултет медицинских наука, Крагујевац 2015.
3. Практикум из физиологије. Рајковача 3, Матавуљ А и сарадници, Бањалука, 2007.

Examination Form:

Pre-Exam Duties	**Final Exam**	**Total Points**

Attendance	**4**	**Practical and oral**	**50**	**100**
Practical midterms (4)	**16**			
Theoretical midterms (2)	**30**			
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Amela Matavulj				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	MEDICINE			
Course Unit Name	**Medical Biochemistry and Chemistry**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	COMPULSORY	III and IV	III: 3L+3P IV: 3L+4P	13
Members of Staff	Prof. Dr Marija Matić, Assist. Prof. Dr Vesna Ćorić, Dr Žana Radić Savić, teaching assistant Prof. Dr Snežana Uletilović			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

Medical biochemistry and chemistry enable students of the second year to get to know the biochemical aspects of the functioning of a healthy organism, covering the cell, tissue and organism. Medical students thus acquire knowledge that will aid in their understanding of the physiological, pathophysiological and pathobiochemical processes in the healthy and the diseased human organism.

Learning Outcomes (knowledge acquired):

Knowledge acquired during classes in biochemistry will provide a medical doctor to understand the pathogenetic mechanisms of various diseases originating at the level of the genome, enzymes (enzymopathy), cell and tissue damage (apoptosis, necrosis, free radicals). Having adopted this knowledge, students will be able to recognize possible causes of pathological states at the level of various tissues, determine the type of patient material for establishing diagnoses, and properly interpret a biochemical laboratory result.
Also, through working in laboratory conditions, the students will get to know the basic concepts of working in biochemical laboratories. By independently carrying out practical tasks, the concept of which is adapted to clinical biochemistry, they get to know diagnostic methods, in preparation for properly using and interpreting these methods in their future work.

Contents of the Course Unit:

Theoretical training:
Chemistry: solutions, chemical reactions, structure of proteins, lipids, carbohydrates.
Medical biochemistry: enzymology, general aspects of the metabolism, carbohydrate metabolism, lipid metabolism, protein and nucleic acid metabolism, organization and functioning of the eukaryotic genome, signal pathways, DNA structure and organization, hierarchy of the endocrine system, biochemical characteristics of individual tissues.

Practical classes: Practicals, Other forms of teaching
Biochemical laboratory diagnostic methods: automated pipetting; making solutions; deriving methods for identifying proteins and sugars in solutions (bodily fluids); use of the colorimeter and knowledge of determining the component concentration in a tested sample (using the standard curve or molar absorption coefficient); centrifuging; biochemical methods for quantifying the concentration of glucose, triacylglycerol, cholesterol, creatinine, urea, bilirubin, uric acid, electrolyte concentration; measurement of enzyme activity in bodily fluids; getting to know the specificities of testing various bodily fluids (urine).

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work

Literature:

1. Ензимологија кроз питања и одговоре, Симић Т, Савић радојевић А., Пљеша Ерцеговац М., Медицински факултет, Београд, 2008
2. Енергетски метаболизам кроз питања и одговоре, Марковић И., Исаковић А. Медицински факултет, Београд, 2008
3. ДНК, РНК и синтеза протеина кроз питања и одговоре, Петронијевић Н., Мисирлић Денчић С. Медицински факултет, Београд, 2008
4. Биохемијске карактеристике преноса сигнала кроз питања и одговоре, Симић Т.,Петронијевић Н., Марковић И., Исаковић А., Радоњић Н. Медицински факултет, Београд, 2008
5. Медицинска биохемија-уџбеник за студенте медицине 1. дио. Исаковић А, Симић Т, Ђуричић Б. Издавач Медицински факултет Универзитета у Београду, Београд, 2017.
6. Марксове основе медицинске биохемије. M. Lieberman, A.D. Marks, C. Smith. Издавач: Data Status, Београд, 2008.

Examination Form: ?

Pre-Exam Duties		Final Exam		Total Points
Chemistry	**10**			
Midterm 1	**10**	**Oral / Written**	**50**	**100**
Midterm 2	**10**			
Practical test	**20**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Marija Matić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	UNDERGRADUATE STUDIES			
	Study Programme of	**MEDICINE**		
Course Unit Name	**Microbiology and Immunology**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	III, IV	III: 3L+3P IV: 3L+4P	15
Members of Staff	- Dr Miroslav Petković, full professor; Dr Maja Travar, associate professor; Dr Aleksandra Šmitran; associate professor; - Dr stom. Ljiljana Božić, senior teaching assistant; Dr Jadranka Stanisavić Šimić, associate; Dr Višnja Mrđen, associate; Dr Jelena Vukić, associate; Dr Sandra Kovačević, associate.			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

The Goals of the Course Unit are for the students to learn:
- basic morphological and physiological traits of microorganisms which cause infectious diseases in humans;
- traits and composition of the human microbiome;
- pathogenic traits and factors of virulence of specific microorganisms;
- fundamentals of the immune response to microorganisms;
- range and transfer routes of specific pathogens;
- basic microbiological procedures in diagnosing specific pathogens;
- basic groups of antimicrobial medication, their effect mechanism and range, as well as mechanisms of microorganism resilience to antimicrobials;
- fundamentals of active and passive immunization to specific pathogens.

Learning Outcomes (knowledge acquired):

Knowledge acquired during classes in microbiology and immunology enables a medical doctor to:
- recognize possible causes of infectious diseases based on the clinical image;
- determine the type of patient material required for microbiological diagnostics of diseases;
- properly interpret a microbiological laboratory result
- apply measures of supervision and prevention of infectious diseases.

Contents of the Course Unit:

Classes in the course unit Microbiology comprise 30 thematic lectures and 30 thematic practicals and seminars, with continuous testing during all the forms of teaching. The theoretical training comprises:
- general and special bacteriology (biological traits of the bacteria cell);
- general and special virology;
- protozoology and parasitology;
- mycology and
- entomology.

Practical classes: (practicals and seminars) cover the same topics as the theoretical training.

Teaching Methods:

Lectures, practicals, seminars, midterms, office hours, and independent student work.

Literature:

Група аутора. Медицинска микробиологија. Уредници Бранислава Савић, Сања Митровић и Тања Јовановић. Libri medicorum, Медицински факултет у Београду, Београд, 2019.

Examination Form:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**5**	**Oral / Written**	**50**	**100**
Midterm(s)	**45**			
Seminar paper				

Note for the Course Unit:

Syllabus Designer: Prof. Dr Miroslav Petković

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	MEDICINE			
Course Unit Name	**Clinical Practicum I**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	COMPULSORY	III + IV	III: 1L+1P IV: 1L+1P	4
Members of Staff	1. Prof. Dr Nada Banjac, 2. Prof. Dr Velibor Vasović, 3. Renata Hadžić, MSc, 4. Dalibor Mihajlović, MSc, 5. Darko Obradović, emerg. med. specialist, 6. Srđan Vujičić, emerg. med. specialist, 7. Snježana Kozomara, emerg. med. specialist, 8. Dragan Sladojević, emerg. med. specialist.			

Eligibility Requirements	**Form of Requirements**
n/a	/

Goals of the Course Unit

The students are to get to know and adopt knowledge on the levels of health care, objective assessment of the patient's overall condition for each system, taking a patient's medical history, recognizing levels of consciousness and assessment of vital parameters such as breathing, heart rate, blood pressure, body temperature. They are to adopt knowledge on the specificities of excretions, manner of administering medication, principles of asepsis and antisepsis, importance of the pain scale, protocol of psychophysical preparation for diagnostic, therapeutic and preoperative preparation, procedures of implementing the nasogastric tube, urinary catheter, enema; proper positioning of the patient in specific states and transport options.

Learning Outcomes (knowledge acquired):

Having attended theoretical and practical classes, the students will have taken patient histories and mastered communication and proper bedside manner when collecting information, learned how to make proper assessments on the gravity of the patient's condition, learn how to carry out a physical examination and objective observation of the patient's systems, learn how to carry out inspection, palpation, percussion and auscultation, recognize and determine vital parameters in normal and pathological states, get to know basic diagnostic and treatment procedures, master the principles and application of sterilization, asepsis and antisepsis, know the principles of proper nutrition and the significance of the parenteral nutrition. They will have learned various manners of administering medication, inserting probes and enemas, and determining the pain scale and proper positioning of patients with different conditions. Students are expected to be able to explain the theoretical background of these skills and to independently apply them as indicated by the patient's condition.

Contents of the Course Unit:

1. Observation and assessment of patients on admission; 2. Vital signs and measurement; 3. Traits and pathological characteristics of excretions; 4. Consciousness disorders and the patients' mental state; 5. Preoperative preparation and diagnostic methods; 6. Shock; 7. Nutrition and dieting; 8. Intake of medication; 9. Hand hygiene, disinfection and sterilization; 10. Implementation of technical procedures and importance of the pain scale; 11. Intradermal tests; 12. Blood transfusion; 13. Enema, catheterization and use of glucose metres; 14. Position and transport of patients.

Teaching Methods:

Classes include lectures and presentations, as well as practicals with dummy models adapted to the pertinent skills being practiced.

Literature:

Основи клиничке праксе, проф. др Нада Бањац, 2019.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**40**			
Seminar paper				

Note for the Course Unit:
/
Syllabus Designer: Dr Nada Banjac, associate professor, emerg. med. specialist

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
	UNDERGRADUATE STUDIES				
	Study Programme of	**MEDICINE**			
Course Unit Name	**Medical Statistics**				
Type of Course Unit	**General Education**				
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**	
TO BE DESIGNATED	COMPULSORY	IV	2L + 2P	4	
Members of Staff	Dr Ivan Soldatović, assistant professor				

Eligibility Requirements	**Form of Requirements**
	As provided by the Rules of Study at the integrated study programme of medicine.

Goals of the Course Unit

The Goals of the Course Unit Medical Statistics are for the students, future medical doctors, to acquire the skills and knowledge of present-day scientific methodology and statistics in order to understand and participate in the scientific research process, understanding scientific literature, as well as in the organization, gathering and processing data and presenting results of medical studies.

Learning Outcomes (knowledge acquired):

After mastering the theoretical and practical subject-matter in medical statistics, the students will have mastered the skills and theoretical knowledge needed for planning a study, gathering, processing and analyzing data, displaying results and reaching conclusions on an issue.
The acquired knowledge will enable the students to actively participate in scientific research, creating study protocols, defining goals and hypotheses and drafting reports, i.e. publication in line with the principles of present-day scientific research practice.
The theoretical and practical knowledge will help the students, future medical doctors, to understand the results of scientific research publications and thus further their own theoretical and practical knowledge.

Contents of the Course Unit:

Fundamentals of Medical Statistics. Basic terms in statistics. Probability and probability distribution. Sampling. Data processing. Statistical description of data. Basic set parameter evaluation and statistical conclusion. Statistical analysis. Parameter methods for difference testing. Non-parameter methods for difference testing. Testing correlation. Diagnostic accuracy.

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work

Literature:

Јаношевић С, Дотлић Р, Ерић Маринковић Ј. Медицинска статистика 6-то издање. Медицински факултет, Београд 2013.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm (1)	**40**			
Seminar paper	**-**			

Note for the Course Unit:

Syllabus Designer: Dr Ivan Soldatović, assistant professor

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Fundamentals of Laboratory Techniques in Studying Proteins**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	III	1L+1P	2
Members of Staff	Prof. Dr Marija Matić, Assist. Prof. Dr Vesna Ćorić, Dr Žana Radić Savić, teaching assistant			

Eligibility Requirements	**Form of Requirements**
n/a	

Goals of the Course Unit

Acquisition of basic knowledge necessary for studying the structure and function of proteins: preparation of tissue samples for protein purification, principles and techniques for protein isolation and purification.

Learning Outcomes (knowledge acquired):

The knowledge acquired during classes of this elective course unit enables a medical doctor to determine the type of patient material for identifying a specific protein, gain basic skills for separating the target protein, determine the methodology for characterizing specific proteins, and understand pathogenetic medicine of different diseases resulting from the level of proteome disorder.

Contents of the Course Unit:

Proteomics, protein identification, immunoblot, electrophoresis.

Teaching Methods:

The classes are given in the form of lectures, seminars, office hours, and independent student work.

Literature:

1. Chemical and Biological Foundations of Biochemistry. U: Marks' Basic Medical Biochemistry, 4th Edition, Lieberman, Marks and Peet. Ed. Lippincott, Williams and Wilkins, Baltimore, 2013.
2. Introduction to the cell. U: Molecular Biology of the Cell, 6th Edition, Alberts, Johnson, Lewis, Morgan, Raff, Roberts, Walter. Ed. New York, Garland Science, Taylor & Francis Group, 2014.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Seminar paper	**50**	**Oral / Written**	**50**	**100**

Note for the Course Unit:

Syllabus Designer: Prof. Dr Marija Matić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**History of Medicine I**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	III	1L+1P	2
Members of Staff	Dr Miloš Stojiljković, full professor			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

Adoption of current theoretical knowledge in the history of medicine, from the Sumerian and Mesopotamian civilization up to late 19th century, beginning with a broad social framework of each epoch and taking into account the development of other, related scientific fields and technologies in general. The students should be able to acquire initial general knowledge on the history of medicine, which they will build upon during their further studies.

Learning Outcomes (knowledge acquired):

Cognitive domain – knowledge

1. Medicine of the ancient peoples (Sumerian and Mesopotamian medicine). 2. Ancient Egyptian medicine. 3. Ancient Indian medicine. 4. Ancient Chinese medicine. 5. Ancient Greek medicine. 6. Arabian medicine. 7. Medieval medicine. 8. Renaissance medicine. 9. 16th century medicine. 10. 17th century medicine. 18th century medicine.

Psychomotor domain – skills:

The course unit type is General Education.

Contents of the Course Unit:

Medicine of the ancient peoples – Sumerian and Mesopotamian medicine; ancient Egyptian medicine; ancient Indian medicine; ancient Chinese medicine; ancient Greek medicine; Arabian medicine; medieval medicine; renaissance medicine; 16th century medicine; development of anatomy and surgery; 17th century medicine; development of physiology; 18th century medicine; first medical school in Vienna.

Teaching Methods:

The classes are given in the form of lectures, theoretical practicals, office hours, and independent student work.

Literature:

Basic literature

1. Глесингер Л. Повијест медицине. Загреб: Школска књига; 1978.
2. Тимотић Б, Обрадовић М. Историја медицине: хронологија најзначајнијих открића у области медицине, стоматологије и фармације. Београд: Елит Медика; 2008.

Additional reading

3. Parker S. Medicine: The Definite Illustrated History. London: Dorling Kindesley Limited; 2016.

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Seminar paper	**40**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Miloš Stojiljković

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Physiology of Aging and Positive Contribution to Healthy Aging**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	III	1L+1P	2
Members of Staff	Dr Amela Matavulj, full professor, Head of Department; Dr Nenad Ponorac, full professor; Dr Zvezdana Rajkovača, full professor; Dr Tanja Šobot, assistant professor; Zorislava Bajić, Msc, senior teaching assistant; Sonja Marinković, associate.			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme of medicine.

Goals of the Course Unit

The goals of this course unit is for the students to expand their knowledge of the normal functioning of the human organism (medical physiology) with present-day knowledge on the physiological processes and adaptive mechanisms of the organ systems, organs and tissues during the aging stage of the organism and note the positive contribution of physical activity and other factors (nutritive, pharmacological and regenerative) to healthy aging of the organism and longevity.

Learning Outcomes (knowledge acquired):

Having mastered the subject-matter and having passed the exam, the student will be able to: perceive, describe, differentiate and explain the most important control mechanism (negative and positive feedback loops) relevant to maintaining homeostasis in senior years of life; name and explain structural and functional changes that occur in any organ system, as a consequence of aging and diminishing adaptive capacities at the level of each cell, tissue and organ; use the acquired knowledge for the practical application of the positive effects of physical activity, proper nutrition, regenerative and pharmacological procedures on healthy aging, longevity and improvement of the quality of life in senior years.

Contents of the Course Unit:

Old age as a stage of life: basic physiological terms related to aging and methods used to study aging. History of human longevity. Nervous system: structural, biochemical, metabolic, circulatory and functional changes during aging. Sensory system: healthy aging. Autonomous nervous system and the adrenal gland: stress, adaptation and longevity. Hypophysis, epiphysis, thyroid, parathyroid glands, endocrine pancreas and aging. Female reproductive aging and menopause. Male reproductive aging. Immune system and old age. Cardiovascular changes in old age: atherosclerosis, hypertension, coronary heart disease. Aging of the respiratory system. Kidneys, urinary tract, bodily fluids in old age. Gastrointestinal system and liver. Osteoarticular system and skeletal musculature. Skin and aging. Prevention and healthy aging: nutrition and effects of dietary restriction; benefits of physical activity; pharmacology and supplementation in old age; regenerative perspective and innovative technologies.

Teaching Methods:

The classes are given in the form of lectures, practicals and seminars, midterms, office hours, and independent student work.

Literature:

1. Медицинска физиологија (превод тринаестог издања). Guyton AC, Hall, Data Status, Београд, 2019.
2. Ганонгов преглед медицинске физиологије (прво издање на српском језику). Ganong William, Факултет медицинских наука, Крагујевац , 2015.
3. Physiology of Exercise and Healthy Aging (second edition). Taylor AW, Human Kinetics, Ontario, Canada, 2021.
4. Physiological Basis of Aging and Geriatrics (fourth edition). Timiras PS, Informa Healthcare, New York, USA, 2007.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**4**	**Oral / Written**	**50**	**100**
Midterm(s)	**20**			
Seminar paper	**26**			

Note for the Course Unit:

Syllabus Designer: Assist. Prof. Dr Tanja Šobot, Prof. Dr Amela Matavulj, Prof. Dr Nenad Ponorac

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Serbian Language - conversation**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	OPTIONAL	III	1L + 1P	2
Members of Staff				

Eligibility Requirements	**Form of Requirements**
-	-

Goals of the Course Unit

This course unit enables students to focus on basic phrases, and adopt vocabulary with selected topics for communication. They will be introduced to grammatical structures through conversation. The classes focus on communications, listening, speaking, reading and writing skills.

Learning Outcomes (knowledge acquired):

Students will be able to participate in conversations.
They will learn how to communicate in necessary situations.

Contents of the Course Unit:

The working day, Present simple and Past simple; Vocabulary to de scribe objects and persons; Modal verbs of obligation; Contrast words; Working holidays; Conferences, Comparatives and superlatives; New places, new people; Teamwork, Vocabulary to describe aims and achievements; Quantifiers; Adjectives and adverbs, Comparison; Communication between the patient and the doctor.

Teaching Methods:

Classes include the following methods: communication metod, listening and watching audio and video content; reading short texts; practice student speaking skills; independent student work

Literature:

Maja Stojanović: Kod nas se kaže… / We tend to say…, 2021.

Pavle Ćosić: Srpski za strance, 2011.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**4**	**Oral / Written**	**50**	**100**
Midterms (2)	**46**			
Seminar paper				

Note for the Course Unit:

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Syllabus Designer:

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**Medicine**

Course Unit Name	**Chinese Language 1**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	III	1L+1P	2
Members of Staff	Shen Li			

Eligibility Requirements	**Form of Requirements**
n/a	

Goals of the Course Unit

The course unit description is fully compliant to the European framework for learning the Chinese language. After one academic semester, the candidates should reach the elementary level A1 (breakthrough).
The goal of the A1 level: Knowledge of Chinese phonetics (21 initials, 25 finals, 4 tones), knowledge of basic vocabulary (greetings, names, nationalities, introductions, hobbies, orientation, numbers, interests, daily needs etc.), basic grammar (subject + predicate + object, subject + degree adverb + adjective, general interrogative sentences, past, present and future tense), methods and skill of writing basic Chinese characters. Basic knowledge on the state of affairs in China, the Chinese traditional culture, traditional medicine and integration of knowledge on the culture and the language.

Learning Outcomes (knowledge acquired):

The candidates will be able to: 1. Master 150 words in line with the European framework for learning the Chinese language and HSK 1 (Chinese language test); 2. Fully understand all the words and texts from the textbook and to apply the knowledge in speaking and writing. 3. Learn more about the Chinese culture, geographical position, important annual festivals, politics and relations between China and BiH, Chinese traditional medicine. 4. Get to know Chinese characters and how they are written.

Contents of the Course Unit:

Preparation and beginning of the semester:

Phonetics: initials, finals, tones, syllables and basic knowledge of phonetics
Learning and practical pronunciation: consonants and basic vowels
Learning and practical pronunciation: Complex vowels, syllables and the four tones
Fundamentals of Chinese characters: 17 strokes, 6 basic, 7 structures of Chinese characters.
Chinese culture – traditional festivals in China, Chinese painting and calligraphy, Chinese traditional medicine.
Fundamentals of grammar: interrogative sentences with “ma”, the structural particle “de” in possessive form.
Daily communication: questions and answers on age, telephone number, family, numbers up to 100, discussing hobbies
Revision and midterm

Teaching Methods:

Lectures. practicals, midterm, exam

Literature:

Mandatory literature:
- Song Lianyi (2012): European Benchmarking Chinese Language Project Seminar 3, Berlin.
- Jiang Liping (2014): Standard *Course HSK1*, Beijing Language and Culture University Press, Bejing.
- HanBan Headquarter (2015), HSK 1 Test Syllabus, People's Education Press, Beijing.
- Liu Xun (2010), New Practical Chinese Reader, Beijing Language and Culture University Press, Bejing
- Wu Zhongwei (2014): Contemporary Chinese. Chinese Language Teaching Press, Beijing

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**2x20**			
Seminar paper				

Note for the Course Unit:

Syllabus Designer: Shen Li

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Biochemistry of Free Radicals**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	IV	1L+1P	2
Members of Staff	Prof. Dr Marija Matić, Assist. Prof. Dr Vesna Ćorić, Dr Žana Radić Savić, teaching assistant			

Eligibility Requirements	**Form of Requirements**
n/a	

Goals of the Course Unit

Adoption of current theoretical knowledge and practical skills in oxidative stress, free radicals and antioxidant protection.

Learning Outcomes (knowledge acquired):

Knowledge acquired during this elective course unit will enable the students to get to know indicators of oxidative damage, and to understand free radical formation mechanisms. The students will get to know the most common antioxidants in biological systems, and through independent performance in practicals they will acquire the ability to independently determine the most important indicators of oxidative damage and to determine the activities of the most important antioxidant enzymes.

Contents of the Course Unit:

Indicators of oc damage, nitrogen-derived and oxygen-derived free radicals, enzymatic and non-enzymatic antioxidant protection, antioxidants and prooxidants, implementation of prooxidants in treatment.

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars, office hours, and independent student work.

Literature:

1. Oxidative Stress: Eustress and Distress in Redox Homeostasis by H Sies · 2019 1st Edition - Elsevier
2. Measuring Oxidants and Oxidative Stress in Biological Systems by LJ Berliner Springer; 2020. Editors. Lawrence J. Berliner Narasimham L. Parinandi
3. Pathology: Oxidative Stress and Dietary Antioxidants 1st Edition Elsevier

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Seminar paper	**50**	**Oral / Written**	**50**	**100**

Note for the Course Unit:

Syllabus Designer: Prof. Dr Marija Matić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Fundamentals of Classification and Assessment of Pain**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	IV	1L+1P	2
Members of Staff	1. Prof. Dr Nada Banjac, 2. Prof. Dr Velibor Vasović, 3. Renata Hadžić, MSc, 4. Dalibor Mihajlović, MSc, 5. Darko Obradović, emerg. med. specialist, 6. Srđan Vujičić, emerg. med. specialist, 7. Snježana Kozomara, emerg. med. specialist, 8. Dragan Sladojević, emerg. med. specialist.			

Eligibility Requirements	**Form of Requirements**
n/a	/

Goals of the Course Unit

The students are to get to know and master a multidisciplinary approach to a very complex subject-matter that involves the entity of pain, which is present in many conditions. They are to get to know, in detail, the anatomical, physiological and biochemical background of pain, as well as the pharmacological aspects and the use of analgesics in the treatment of painful conditions. They are also to master determining the degree of pain and the steps of the epidemiological, etiological, diagnostical and therapeutical aspects of pain which significantly impact the quality and outcome of treatment.

Learning Outcomes (knowledge acquired):

Having acquired the theoretical knowledge and practical procedures to determine the pain scale, the students will be able to properly determine the type of pain, its origin and pathophysiology, apply treatment in line with their assessment, take into account mental disorders which are manifested through pain syndromes, recognize groups of patients at risk of complications in treatment of painful conditions with specific medication and recognize side effects in pain pharmacotherapy and with techniques of physical therapy in pain management. Upon acquiring the knowledge, the students will be able to differentiate types of pain in relation to the different pain-inducing conditions (cancer, neuropathy etc.)

Contents of the Course Unit:

1. Physiology and classification of pain; 2. Pain intensity assessment scales and clinical evaluation of pain; 3. Psychosocial factor in the origin and management of pain; 4. Types of pain; 4. Pain management; 5. Pain syndromes

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work

Literature:

Основи клиничке праксе, проф. др Нада Бањац, 2019.
Медицина бола, Предраг Стевановић, Дејан Нешић, Небојша Лађевић, 2020.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**40**			
Seminar paper				

Note for the Course Unit:

Syllabus Designer: Dr Nada Banjac, associate professor, emerg. med. specialist

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
Study Programme of	**MEDICINE**	

Course Unit Name	**Physiology of Physical Activity**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	IV	1L+1P	2
Members of Staff	Prof. Dr Amela Matavulj, Prof. Dr Nenad Ponorac, Assist. Prof. Dr Tanja Šobot, Zorislava Zagorac, MSc			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

To enable the students to get to know the adaptation reactions of the organism (acute and chronic) as processes of adapting to gradually increasing demands of a physical activity.

Learning Outcomes (knowledge acquired):

Having passed the exam, the students will be able to understand acute changes in the organism during physical exertion and chronic adaptation changes which are consequent to different types of training protocols; they will be able to compare the differences in the functioning of individual organ systems during physical exertion in relation to resting state; they will be able to independently assess basic functional parameters of physical ability and to understand the fundamentals of proper nutrition in sports. The students will be able to apply recommendations on the significance of physical activity to health, as well as recommendations on supplements and the use of doping agents in sports.

Contents of the Course Unit:

Acute physiological response of the organism to physical activity. Chronic physiological response of the organism to physical activity. Ergometric, determination of energetic capacity, metabolic adaptation to training. Adaptation to aerobic and anaerobic training. Physical activity, health and disease prevention. Hormonal regulation in physical activity. Impact of external factors on physical activity. Thermoregulation and physical exertion. Physical activity in hypobaric/hyperbaric conditions, in outer space. Nutrition. Function of the gastrointestinal system during physical activity. Balance of water and electrolytes during physical exertion, dehydration and physical ability during exertion. Doping and supplementation in sports.

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars, midterms, office hours, and independent student work

Literature:

Физиологија спорта и вјежбања. Selected chapters.
Larry W. Kenney, Jack H. Wilmore, David L. Costill. Human Kinetics. 20219

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**5**			**100**
Midterm(s)	**20**	**Oral / Written**	**50**	
Seminar paper	**25**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Nenad Ponorac, Prof. Dr Amela Matavulj, Assist. Prof. Dr Tanja Šobot

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Chinese Language 2**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	IV	1L+1P	2
Members of Staff	Shen Li			

Eligibility Requirements	**Form of Requirements**
Exam in Chinese Language 1 must be passed	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

The course unit description is fully compliant to the European framework for learning the Chinese language. After one academic semester, the participants should reach the A2 basic level. The students can understand subject-matter in basic Chinese, relating to everyday activities. They can repeat, list and read back words or sentences. They have basic knowledge on the methods of learning, communication, resources and interdisciplinary methods used in specific situations. They acquire additional knowledge on the Chinese culture and an introductory understanding of a different culture and international perspective.
Aims of the A2 level:
Daily communication: telephone numbers, questions and answers on nationality, orientation.
Chinese characters: recognizing and writing three-stroke characters
Fundamentals of grammar: sentences with the subject-predicate structure as predicate
Fundamentals of grammar: Sentences with a nominal predicate, the “number+classifier+noun” structure
Daily communication: naming professions and occupations, comments
Discussing similarities and difference between the Chinese and local culture

Learning Outcomes (knowledge acquired):

The candidates will be able to: 1. Master 300 words in line with the European framework for learning the Chinese language and HSK 2 (Chinese language test); 2. Fully understand all the words and texts from the textbook and to apply the knowledge in speaking and writing. 3. Learn more about the Chinese culture, important historical events, politics and relations between China and BiH, Chinese traditional medicine

Contents of the Course Unit:

Daily communication: telephone numbers, questions and answers on nationality, orientation.
Chinese characters: recognizing and writing multiple-stroke characters
Fundamentals of grammar: sentences with the subject-predicate structure as predicate
Fundamentals of grammar: Sentences with a nominal predicate, the “number+classifier+noun” structure
Daily communication: naming professions and occupations, comments
Discussing similarities and difference between the Chinese and local culture and art
Revision and midterm

Teaching Methods:

Lectures. practicals, midterm, exam

Literature:

Song Lianyi (2012): European Benchmarking Chinese Language Project Seminar 3, Berlin.
- Jiang Liping (2014): Standard *Course HSK1*, Beijing Language and Culture University Press, Bejing.
- HanBan Headquarter (2015), HSK 1 Test Syllabus, People's Education Press, Beijing.
- Liu Xun (2010), New Practical Chinese Reader, Beijing Language and Culture University Press, Bejing
- Wu Zhongwei (2014): Contemporary Chinese. Chinese Language Teaching Press, Beijing

Examination Form:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**2x20**			
Seminar paper				
Note for the Course Unit:				
Syllabus Designer: Shen Li				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	MEDICINE			
Course Unit Name	**HUMAN MICROBIOME**			
Type of Course Unit	**Pre-clinical course unit**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	IV	1L+1P	2
Members of Staff	- Dr Miroslav Petković, full professor; Dr Maja Travar, associate professor; Dr Aleksandra Šmitran; associate professor.			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

The Goals of the Course Unit are for the students to learn:
- basic traits of hue human microbiome;
- early childhood microbiome formation;
- specific microbiomes for specific body parts;
- change of microbiome with age;
- host and environment factors that impact the microbiome;
- correlation of the microbiome with specific diseases;
- procedures for influencing the microbiome.

Learning Outcomes (knowledge acquired):

Knowledge acquired from getting to know the human microbiome enables a medical doctor to:
- recognize the role of the microbiome for the normal functioning of the organism;
- master the ways of determining the composition of the microbiome in specific body parts;
- properly interpret the significance of the microbiome to specific diseases;
- implement procedures for maintaining and establishing a normal microbiome.

Contents of the Course Unit:

Classes in this course unit comprise 10 thematic lectures, with continuous testing during all the forms of teaching. The theoretical training comprises diagnostics:
- definition and significance of the human microbiome;
- composition of microbiomes in specific body parts;
- changes of the microbiome with age;
- how to determine microbiome composition;
- correlation of the microbiome disorder (dysbiosis) with specific diseases;
- impact of nutrition on the microbiome;
- impact of antimicrobial medication on the microbiome;
- impact of probiotics on the microbiome.

Teaching Methods:

Lectures, seminars, office hours, and independent student work.

Literature:

Microbiome in Human Health and Disease. Pallaval Veera Bramhachari. Springer, Singapore, 2021.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**

Midterm(s)	**40**			
Seminar paper				
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Miroslav Petković				

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
	UNDERGRADUATE STUDIES	
	MEDICINE	

	MICROBIOLOGICAL DIAGNOSTICS OF CENTRAL NERVOUS SYSTEM INFECTIONS			
Type of Course Unit	**Pre-clinical course unit**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	IV	1L+1P	2
Members of Staff	- Dr Miroslav Petković, full professor; Dr Maja Travar, associate professor; Dr Aleksandra Šmitran; associate professor.			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

The Goals of the Course Unit are for the students to learn:
- basic morphological and physiological traits of the causes of infectious diseases of the nervous system (NS);
- pathogenic traits and virulence factors of specific causes of infectious diseases of the NS;
- basics of the immune response to the cause of infectious diseases of the NS;
- incidence and transmission paths of specific causes of infectious diseases of the NS;
- basic microbiological procedures in diagnosing specific causes of infectious diseases of the NS;
- basic groups of antimicrobial medication for treating infectious diseases of the NS;
- fundamentals of active and passive immunization to specific causes of infectious diseases of the NS.

Learning Outcomes (knowledge acquired):

Knowledge acquired during classes in microbiology and immunology enables a medical doctor to:
- recognize possible causes of infectious diseases of the NS based on the clinical image;
- determine the type of patient material required for microbiological diagnostics of diseases of the NS;
- properly interpret a microbiological laboratory result
- apply measures of supervision and prevention of infectious diseases of the NS.

Contents of the Course Unit:

Classes in this course unit comprise 10 thematic lectures, with continuous testing during all the forms of teaching. The theoretical training comprises diagnostics:
- bacterial infections of the NS;
- neuromuscular diseases caused by bacterial exotoxins;
- viral infections of the NS;
- protozoan infections of the NS;
- fungal infections of the NS;
- infections caused by tapeworms;
- specific infectious diseases of the NS;
- chronic infections of the NS;
- prion diseases.

Teaching Methods:

Lectures, seminars, office hours, and independent student work.

Literature:

Микробиолошка дијагностика инфекција нервног система. Мирослав Петковић, Маја Травар. Медицински факултет Бања Лука, Бања Лука, 2013.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**40**			
Seminar paper				
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Miroslav Petković				

THIRD YEAR

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	UNDERGRADUATE STUDIES			
	Study Programme of	**MEDICINE**		
Course Unit Name	**ANATOMIC PATHOLOGY**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	COMPULSORY	V and VI	V: 5L + 3P VI: 4L + 3P	17
Members of Staff	Dr Radoslav Gajanin, full professor, head of the department; Dr Slaviša Đuričić, associate professor; Dr Aleksandra Salapura, associate professor; Dr Božana Babić, senior teaching assistant; Dr Vanja Kukić, teaching assistant; Dr Svetlana Tomašević-Pavlović, associate; Dr Goran Čampara, associate, Dr Daliborka Gavranović Pilić, associate			

Eligibility Requirements	**Form of Requirements**
Anatomy, Histology and Embryology	These course units must be passed as a requirement for attendance

Goals of the Course Unit

The aim of the course unit is to provide the students with knowledge on the cell, tissue and organ damage mechanisms and introduce them to morphological changes that underlie diseases. At the same time, the purpose of the classes is to enable the students to recognize morphological changes in cells, tissues and organs through the adoption of theoretical knowledge in lectures and seminars and the acquisition of individual experience at clinical autopsies, microscopy work and analysis of macroscopic slides.
The acquired knowledge and skills will provide for better understanding of disease cause and incidence mechanisms, and facilitate mastering the functional consequences of morphological changes.

Learning Outcomes (knowledge acquired):

Having passed the exam, the students will be able to understand cell, tissue and organ damage mechanisms, recognize and describe morphological changes in organs, tissues and cells that resulted from various etiological factors. The students will be able to understand the clinical presentation of a disease, and to select additional diagnostic procedures that are optimal for confirming a suspicion for a specific disease. The students will be able to interpret pathohistological results, predict the course of a disease, opt for additional diagnostic methods to confirm and monitor a disease. The students will also be able to predict which treatment options are advised for the disease they have diagnosed.

Contents of the Course Unit:

The cell as the foundation of health and disease development; Damage, death and adaptation of cells; Inflammation and reparation; Hemodynamic disorders, thromboembolism and shock; Immune system disorders; Neoplasia; Genetic and children's diseases; Disease related to the environment and nutrition; General pathology of infectious diseases; Pathology of blood vessels; Pathology of the heart; Pathology of the hematopoietic and lymphatic system; Pathology of the lungs; Pathology of the kidneys and the urinary collecting duct; Pathology of the oral cavity and the gastrointestinal tract; Pathology of the liver and gallbladder; Pathology of the pancreas; Pathology of the male genital system and lower urinary tract; Pathology of the female genital system and the breasts; Pathology of the endocrine system; Pathology of the bones and joints and soft-tissue tumors; Pathology of the peripheral nerves and the muscles; Pathology of the central nervous system; Pathology of the skin.

Teaching Methods:

The classes are given in the form of lectures, interactive practicals (macroscopic practicals, autopsies, histology practicals), seminars, midterms, office hours, and independent student work.

Literature:

1. Кумар В, Аббас АК, Астер ЈЦ. Робинсове основе патологије – Интернационално издање. десето издање. Београд: Датастатус, 2021.
2. Гајанин, Р. и Клем, И. (2004). Приручник за патохистолошке вјежбе за студенте медицине и стоматологије. 1. издање. Бањалука: Д*С.

Examination Form:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**5**	**Oral / Written**	**45**	**100**
Midterm(s)	**30**			
Seminar paper	**10**			
Practical test	**10**			
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Radoslav Gajanin				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of	MEDICINE

Course Unit Name	Pathophysiology			
Type of Course Unit	General Education			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	V and VI	V: 2L+3P VI: 3L+3P	13
Members of Staff	Prof. Dr Nela Rašeta Simović, full professor; Prof. Dr Darko Golić, associate professor, Assist. Prof. Dr Milorad Vujnić; Tatjana Milivojac, MSc, senior teaching assistant; Alma Prtina, MSc, associate			

Eligibility Requirements	Form of Requirements
Medical Biochemistry and Medical Physiology	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

The goals of classes in pathophysiology, as a bridge between pre-clinical and clinical course units, are for students to adopt current theoretical knowledge and practical skills in: 1. study and analysis of specific etiological factors and their properties, which instigate pathological processes in the organism, and their interaction with organism structure; 2. understanding the genesis of the pathological process at the level of the molecule, biochemical subcellular and cellular damage, through humoral tissue functional disorders, to function disorders of organ systems which lead to the incidence of disease; 3. study how a diseased organism adapts and responds to the environment; 4. principles of functional examination, and practical skills in functional examination system by system

Learning Outcomes (knowledge acquired):

Knowledge acquired during classes in pathophysiology enables the student and medical doctor to: 1. identify the cause of the disease; 2. get to know and understand the mechanisms of the incidence of function disorders in a diseased organism which lead to clinical manifestations of the disease; 3. adopt the practical skills in function examination system by system and interpretation of pathological results.

Contents of the Course Unit:

General pathophysiology: Etiology and pathogenesis, disease and death. Physical and chemical etiological factors. Inheritance as an etiological factor. Disorders of local circulation. Shock. Inflammation and infection. Organism defense mechanisms. Disorders of the immune system. Pathophysiological aspects of malignant tumors. Disorders of the metabolism of proteins, carbohydrates and lipids. Disorders of the metabolism of vitamins, essential oligoelements and enzymopathy. Disorders of Acid–Base balance, metabolism of water and electrolytes.
Special pathophysiology: Endocrinopathies. Pathophysiology of the cardiovascular system. Pathophysiology of blood and hematopoietic organs. Pathophysiology of respiration. Pathophysiology of the digestive system. Disorders of the hepatobiliary system. Disorder of the function of the kidneys and the urinary tract. Pathophysiology of the nervous system. Disorders of the locomotor system.

Teaching Methods:

The classes are given in the form of lectures, practicals, theoretical practicals, midterms, office hours, and independent student work

Literature:

Core reading:

Кулаузов М. и сар. Општа патолошка физиологија, 2015. Orthomedics Book Нови Сад.

Кулаузов М. и сар. Специјална патолошка физиологија, 2011. Orthomedics Book Нови Сад.

Дујмовић Ф, Стошић З, Ђерић М. Практикум из патолошке физиологије, 2012. Медицински факултет Нови Сад.

Стошић З, Борота Р. Употреба функцијских испитивања у дијагнози болести – проблемски задаци из патолошке физиологије, 2015. Медицински факултет Нови Сад.

Additional reading:

Гамулин С. и сар. Патофизиологија, 2018. Медицинска наклада Загреб.

Стошић З, Борота Р. Основи клиничке патофизиологије, 2012. Медицински факултет Нови Сад.

Ђерић М, Стошић З. Тест питања и репетиторијум из патолошке физиологије, 2018. Медицински факултет Нови Сад.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Practical and oral**	**50**	**100**
Midterms	**40**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Nela Rašeta Simović

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	MEDICINE			
Course Unit Name	**Pharmacology with Toxicology**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	COMPULSORY	V and VI	V: 3L+2P VI: 3L+2P	12
Members of Staff	Prof. Svjetlana Stoisavljević Šatara, Prof. Ranko Škrbić, Prof. Miloš Stojiljković, Prof. Lana Nežić, Assist. Prof. Nataša Stojaković, Ana Golić Jelić, Associate Đorđe Đukanović and Žana Maksimović			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

The students are to acquire current theoretical knowledge and practical skills in general pharmacology, mechanisms of action, therapeutic and unwanted reactions to medication, methods of delivery, indications and contraindications of the major groups of medication, and knowledge on the pharmacological traits of medication which illustrate individual pharmacodynamic group. Also, they are to adopt the basic principles of toxicology, and the most common acute and chronic poisonings that a physician will possibly encounter in primary health care. The students are also to acquire the skill of writing prescriptions for various types of medication, and the skills and knowledge for properly approaching and using good quality sources of pharmacological literature.

Learning Outcomes (knowledge acquired):

Explain general principles of pharmacokinetics and pharmacodynamics; 2. List and describe factors that modify the effect of medication; 3. List the types and explain the mechanisms of interaction of simultaneously applied medication; 4. Classify medicaments into individual groups/subgroups; 5. Explain application, mechanisms of action at the cellular and molecular level, pharmacological effect on different organ systems, major indications, contraindications, unwanted reactions and toxicity of specific medication which are representative of their pharmacotherapeutic groups and subgroups; Identify symptoms and signs of allergic reactions and anaphylaxis, and treatment methods; 6. Describe the clinically most significant medication poisonings and treatment of poisoned patients, as well as other most common acute and chronic poisonings that a physician will possibly encounter in primary health care; 8. List clinically significant medication interaction; 9. Explain the process of research and development of new medication; Master the skill of writing prescriptions for different types of medication, medication application, dosage, registering unwanted reactions to medication, and use of medication registry.

Contents of the Course Unit:

General pharmacology: basic pharmacological notions, disciplines of pharmacology, development of new medication, mechanisms of action of medication, pharmacokinetics, pharmacogenomics, factors that alter the effect of medication. **Special pharmacology**: Pharmacodynamics, pharmacokinetics, indications, contraindications and unwanted reactions to the major pharmacological groups of medication, i.e. their individual representatives. **Toxicology:** Basic principles of toxicology, antidotes, poisoning by medication, pesticides and chemical weapons, heavy metals, caustics, corrosives, poisonous gasses. **Pharmacography**: legislation and rules on writing prescriptions for different types of medication.

Teaching Methods:

The classes are given in the form of lectures, practicals, midterms, office hours, and independent student work
Midterm I (subject-matter from semester 1) 18 points
Midterm II (subject-matter from semester 2) 18 points
Practical test 4 points
To take the Final Exam, the students need to have passes the midterms and practical test.

Literature:

Basic literature

1. Варагић В, Милошевић М.Фармакологија. 24. издање.Београд: Динекс-Медика Граф;2018.
2. Омерагић Е, Бечић Ф. Рационална фармакотерапија са основама фармакографије.Сарајево: Јеж;2003.

Additional reading

2. Rang HP, Ritter JM, Flower RJ and Henderson G. Faramakologija. 8.izdanje.Beograd:Data Status; 2019.

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm (I and II**) + practical**	**40**			
Seminar paper				

Note for the Course Unit:

Syllabus Designer: Prof. Svjetlana Stoisavljević Šatara

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Sciences in Medicine**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	V	1L + 1P	2
Members of Staff	Dr Miloš Stojiljković, full professor, Dr Ranko Škrbić, full professor			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme of medicine.

Goals of the Course Unit

The Goals of the Course Unit are for the students to apply the knowledge previously acquired through General Education course units and pre-clinical course units in acquiring current knowledge and practical skills on the fundamentals of scientific research in medicine. The students will get to know the concept of science and types and ways of organizing research in biomedical sciences.

Learning Outcomes (knowledge acquired):

Having mastered the theoretical and practical subject-matter in Sciences in Medicine and having passed the exam, the student will be able to: notice, define, describe and explain the principles of scientific research in medicine. Describe, differentiate and explain the division of scientific studies in medicine. Name and explain the significance of the control group and randomization in medical studies.
Apply the acquired knowledge in searching medical databases.
Use the acquired theoretical knowledge to draft presentations of scientific results. Get to know elements of scientific papers and explain their purpose.

Contents of the Course Unit:

Definition of the term science Deduction and induction. Types of research in medicine. Primary and secondary research. Basic and applied research. Prospective and retrospective research. Control group. Randomization. Statistical analysis in medical research. Animal studies. Types of clinical studies. Randomized double-blind clinical studies. Ways of searching medical scientific databases. Elements of scientific papers. Presentation of research results.

Teaching Methods:

The classes are given in the form of lectures, practicals, seminars,
midterms, office hours and independent student work.

Literature:

1. Игић Р, Добрић С, Стојиљковић МП, Шкрбић Р. Научна истраживања и научна саопштења. Бања Лука: Медицински факултет Универзитета у Бањој Луци; 2017.
2. Јанковић СМ. Дизајн истраживања. Крагујевац: МЕДРАТ; 2016.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Test**	**50**	**100**
Seminar paper	**40**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Miloš Stojiljković

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	**MEDICINE**			
Course Unit Name	**Medical English**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	V	1L + 1P	2
Members of Staff	Jelena Pažin, MA			

Eligibility Requirements	**Form of Requirements**
Candidates need to have passed English Language (semester 2)	As provided by the Rules of Study at the integrated study programme of medicine.

Goals of the Course Unit

This course unit enables students to get to know and adopt the selected lexical register through texts in English covering topics in the field of medicine. The classes cover topics in various fields of medicine, and the students get to know medical English vocabulary. The selection of material provides an overview of different content from the medical profession. Through practicals, the students develop skills required for communicating with colleagues and patients in a professional environment. They also learn how to converse about diagnoses and treatments, and how to express professional opinions in English. The classes focus on listening, speaking, reading and writing skills, and develop the students' critical thinking skills. as tools for revising familiar vocabulary and for introducing new words. The lessons also reinforce previously adopted grammatical structures.

Learning Outcomes (knowledge acquired):

Having attended classes and passed the exam, the students will be able to use the acquired vocabulary to: successfully understand material in English in the field of medicine (listening and reading comprehension); use professional literature in English; edit and translate professional texts in medicine; successfully communicate in English in a professional environment; successfully express themselves in English in speaking and in writing.

Contents of the Course Unit:

Emergency medicine. Accidents. Sports medicine. Obstetrics. Psychiatry. Geriatrics. Dermatology. Surgery. Cardiology. Respiratory medicine. Tropical diseases. Technology

Teaching Methods:

The classes are given using the combined method, with a communicative approach, by way of lectures, practicals, office hours and independent student work. Classes are delivered by presenting topics, initiating conversation, reading the provided texts, listening and watching audio and video content, and participating in practical exercises. All students are expected to take an active part in the teaching process. Regular attendance during the semester is required for all students.

Literature:

1. McCarter, S. Oxford English for Careers: Medicine 2, Oxford University Press
2. Glendinning, E. Professional English in Use: Medicine, Cambridge University Press
3. Combined material (video and audio material, material taken from popular and professional magazines and other publications)
4. Vocational English language dictionaries

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**4**	**Oral / Written**	**50**	**100**
Midterms (2)	**46**			

Seminar paper				
Note for the Course Unit:				
The course unit requires at least medium-level (CEF B1/B2) knowledge of the English language. Attendance is mandatory. Absences allowed in line with the Rules of Study.				
Syllabus Designer: Jelena Pažin, MA, foreign language skills teacher				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Epidemiology**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	COMPULSORY	V	2L+1P	3
Members of Staff	Janja Bojanić, full professor, Nina Rodić-Vukmir, assistant professor, Jela Aćimović, senior teaching assistant, Jelena Dević-Đaković, associate			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

Adoption of current theoretical knowledge and practical skills in general epidemiology, health promotion, disease prevention, planning and implementation of preventive and counter-epidemic measures of checking and suppressing infectious and mass non-infectious diseases. Adoption and development of communication knowledge and skills in contact with the patients and their family members, colleagues and medical staff, protection and promotion of patient rights. Formation of a broad knowledge base in the students and stimulating research and innovation, as well as student involvement in projects and preparation for future systematical way of thinking and a structured approach to medical issues during their education.

Learning Outcomes (knowledge acquired):

1. Collection, analysis and interpretation of data on health disorders of different etiology
2. Design of fundamental epidemiological studies
3. Application of epidemiological methods in the promotion and prevention of infectious and mass non-infectious diseases
4. Epidemics research
5. Planning and implementing necessary preventive and counter-epidemic measures in checking and suppressing infectious and mass non-infectious diseases

Contents of the Course Unit:

1. Study subject and significance of epidemiology. Epidemiology in the practice of public health. New directions of development in epidemiology.
2. Health disorder frequency indicators. Data sources in epidemiology.
3. Causality in epidemiology and the concept of risk. Epidemiological triage
4. Types of epidemiology studies. Descriptive epidemiology and descriptive studies.
5. Analytical studies. Experimental studies.
6. Measurement errors in epidemiology studies. Public health supervision.
7. Prevention. Screening.
8. Reservoir and source of infection. Portals of entry and exit of infection.
9. Routes of transmission of infectious diseases. Epidemiology of the living environment.
10. Immunization. Epidemics research.
11. Disease suppression measures. Hospital-Acquired Infections.
12. Epidemiology in emergency situations. Biological war and terrorism. Communication, knowledge, skill and practice.
13. Epidemiology of chronic non-infectious disease and strategies for their prevention.
14. Epidemiology of cardiovascular diseases.
15. Epidemiology of malignant tumours. Epidemiology of chronic respiratory diseases.
16. Application of epidemiology in evidence-based medicine. Clinical epidemiology.

Practicals

1. Health disorder frequency indicators.
2. Standardization.
3. Causality in epidemiology and the concept of risk.
4. Natural flow of disease.
5. Disposition and collective immunity.
6. John Snow and cholera (descriptive method).
7. Smoking and lung cancer (case study and control).
8. Smoking and lung cancer (cohort study).
9. Field experiment.
10. Immunization (active).
11. Immunization (passive).

Teaching Methods:

Lectures, practicals, midterm

Literature:

1. Јанковић С, Мијовић Б, Бојанић Ј, Јандрић Љ. Епидемиологија, II издање,Бања Лука: Медицински факултет, Фоча: Медицински факултет Бања Лука, 2015, (од 9-126 стране)
2. Јанковић С, Мијовић Б, Бојанић Ј, Јандрић Љ, Максимовић Н. Практикум, У: Јанковић С. (уредник). II издање,Бања Лука: Медицински факултет, Фоча: Медицински факултет Бања Лука (од 129-235 страна)

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**5**	**Oral / Written**		**100**
Attendance to practicals	**5**	**Exam / Written exam / test**	**50**	
Midterm	**40**			

Note for the Course Unit:

The number of points in the Final Exam must be at least 31. The final grade is formed with the following formula:
Attendance to lectures/practicals + midterm + more than half of the points from the Final Exam.

Syllabus Designer: Prof. Dr Janja Bojanić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Propedeutics**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	COMPULSORY	VI	2L+5P	7
Members of Staff	Head of the department: Prof. Dr Snježana Popović-Pejičić, full professor, corresponding member of ANURS; Prof. Dr Mirko Stanetić, full professor; Acad. Prof. Dr Duško Vulić, full professor; Prof. Dr Krsto Jandrić, full professor; Prof. Dr Sandra Hotić-Lazarević, full professor; Prof. Dr Aleksandar Lazarević, full professor; Prof. Dr Zoran Mavija, full professor; Prof. Dr Branislav Gašić, assistant professor; Prof. Dr Vlastimir Vlatković, assistant professor; Prof. Dr Tamara Kovačević-Preradović, assistant professor; Assist. Prof. Dr Ljubinka Božić-Majstorović; Assist. Prof. Dr Milena Brkić; Assist. Prof. Dr Bojan Stanetić; Assist. Prof. Dr Bojana Carić; Assist. Prof. Dr Ivona Risović; Assist. Prof. Dr Gabrijela Malešević; Valentina Soldat-Stanković, DSc, teaching assistant; Danijela Mandić, MSc, teaching assistant; Jelena Jovanić, MSc, teaching assistant			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

The primary goal of education in clinical propedeuticsis for the students to master techniques of taking a patient's medical history and carrying out a physical examination, as well as to apply their acquired knowledge to their professional, clinical work and scientific research. The goal is to adopt proper bedside manner, master techniques of clinical examination, develop critical thinking and teamwork. Adoption of theoretical knowledge and practical skills in clinical propedeutics.

Learning Outcomes (knowledge acquired):

COMPETENCE LEVEL
The students will master communication with patients, eliciting significant information for recognizing symptoms and signs of disease, clinical examination based on which they will be able to recognize diseases and syndromes and request the required tests and diagnostic procedures following differential diagnosis.

Contents of the Course Unit:

Communication with patients, completing medical histories, recognizing signs and symptoms of diseases, skills of physical examination of patients, examination system by system

Teaching Methods:

The classes are given in the form of lectures, practicals, office hours

Literature:

Ратомир Антић. Интерна пропедевтика. Медицинска књига, Београд, 2005.
Macleouds Clinical Examination Graham Douglas, Fiona Nicol, Colin Robertson

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**5**			**100**
Activity in practicals	**5-15**	**Practical/oral**	**50**	
Seminar paper	**30**			

Note for the Course Unit: 50% of the written exam is a requirement for the student to take the practical/oral part of the exam

Syllabus Designer: Prof. M. Stanetić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Safe Administration of Medication during Pregnancy and Breastfeeding**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	elective	V	1L + 1P	2
Lecturers	Prof. Dr Lana Nežić, Prof. Dr Ranko Škrbić, Prof. Dr Svjetlana Stoisavljević Šatara, Prof. Dr Miloš Stojiljković, Dr Vesna Vujić Aleksić, teaching associate			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year must be passed.	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

The students are to get to know rational choices of medication in respect to the safety of application during pregnancy and breastfeeding, as well as the pharmacotherapy of the most common diseases in this population of patients.

Learning Outcomes (knowledge acquired):

Having attended the classes, the students are expected to master the skills and knowledge relating to:
A. Knowledge of mechanisms of action of medication and its effect on intrauterine development of the fetus and on the health of the child in the postnatal period (repo toxicity), and during lactation.
B. Knowledge of human teratogenic medication, ways of examining and assessing the harmfulness of medication to the health of the fetus, the child and the expecting mother.
C. Knowledge of the principles of rational pharmacotherapy for pregnant women and women who are breastfeeding as patients, with a focus on medication safety in line with principles of evidence-based medicine.

Contents of the Course Unit

Theoretical training

Pharmacokinetics and pharmacodynamics of medication during pregnancy and breastfeeding. Teratogenicity and fetotoxicity of medication. Classification of medication according to risk to the development and health of the fetus and pregnancy progression. Ethical aspects of administering new medication and clinical medication trials and medical instruments during pregnancy and breastfeeding. Rational pharmacotherapy and selection of safe medication for mental and neurological diseases, infections and cardiovascular, oncological and endocrine system diseases during pregnancy. Rational administration of medication during lactation.

Practical classes

Working with sources of data on the safety of medication administered during pregnancy and breastfeeding. Display of the form for consultation with a clinical pharmacologist for administering medication during pregnancy and breastfeeding. Rational pharmacotherapy of different types of pain in pregnancy, administration of vitamins and medication issued without prescriptions, effect of tobacco smoke, alcohol and abuse of drugs on the fetus and pregnancy. Administering medication with risk to the infant, with analysis of data from clinical studies significant to the safety of medication in lactation.

Teaching Methods:

Lectures, practical work – case reviews, working with the digital repository of medication.

Literature:

1. Rang Dale. Фармакологија. (одабрана поглавља) Дата статус, Београд, 2010.
2. Briggs GG, et al. Drugs in Pregnancy and Lactation. 11th Edition, Wolters Kluwer Health 2016.
3. Schaefer , Peters PWJ, Miller MR. Drugs During Pregnancy and Lactation, 3rd Edition, Academic Press, 2014.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s) 1x 30	**40**			

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of	MEDICINE			
Course Unit Name	**History of Medicine II**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	V	1L+1P	2
Members of Staff	Dr Miloš Stojiljković, full professor			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

Adoption of current theoretical knowledge in the history of medicine, from the Sumerian and Mesopotamian civilization up to late 19th century, beginning with a broad social framework of each epoch and taking into account the development of other, related scientific fields and technologies in general. The students should be able to acquire initial general knowledge on the history of medicine, which they will build upon during their further studies.

Learning Outcomes (knowledge acquired):

Cognitive domain – knowledge
1. 19th century medicine. 2. 20th century medicine. 3. Development of diagnostics. 4. Development of pharmacotherapy. 5. Development of surgery. 6. Development of internal medicine. 7. Development of bacteriology and immunology. 8. Development of oncology. 9. Computed tomography and magnetic resonance.
Psychomotor domain – skills:
The course unit type is General Education.

Contents of the Course Unit:

19th century medicine – Second Vienna Medical School; natural sciences in the 19th century; anatomy and physiology in the 19th century; pathological anatomy, bacteriology and serology in the 19th century; Internal medicine and treatment in the 19th century; surgery in the 19th century; maternity, gynaecology, neurology and psychiatry in the 19th century; Ophthalmology, otorhinolaryngology, pediatrics and dermatology in the 19th century; hygiene and public health, discovery of X-rays and the physician social class in the 19th century; medicine of the 20th century; Introduction of stenting and development of cardiovascular surgery; Discovery and application of hormones in disease treatment; progress in oncology and introduction of targeted anticancerous medication; Discovery of new radiological diagnostic methods (computed tomography, nuclear magnetic resonance).

Teaching Methods:

The classes are given in the form of lectures, theoretical practicals, office hours, and independent student work.

Literature:

Basic literature

1. Глесингер Л. Повијест медицине. Загреб: Школска књига; 1978.
2. Тимотић Б, Обрадовић М. Историја медицине: хронологија најзначајнијих открића у области медицине, стоматологије и фармације. Београд: Елит Медика; 2008.

Additional reading

3. Parker S. Medicine: The Definite Illustrated History. London: Dorling Kindesley Limited; 2016.

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Seminar paper	**40**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Miloš Stojiljković

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**DIAGNOSTIC METHODS IN PATHOLOGY**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	V	1L+1P	2
Members of Staff	Dr Radoslav Gajanin, full professor, Head of the department; Dr Slaviša Đuričić, associate professor; Dr Aleksandra Salapura, associate professor, Dr Ljiljana Amidžić, assistant professor.			

Eligibility Requirements	**Form of Requirements**
Anatomy, Histology and Embryology	These course units must be passed as a requirement for attendance

Goals of the Course Unit

The goal of the course unit is to provide students with additional knowledge on diagnostic methods used in pathology. The students will get to know the fundamentals of autopsy diagnostics, macroscopic diagnostics, histological processing of samples and additional methods of processing samples (cytodiagnostics, histochemical diagnostics, immunohistochemical diagnostics, electronic microscope diagnostics, molecular methods of diagnostics).
The acquired knowledge and skills will enable students to choose optimal diagnostic methods, depending on the diagnostic dilemma (differentiation).

Learning Outcomes (knowledge acquired):

Having passed the exam, students will know the fundamentals of diagnostic methods used in pathology. They will also know which diagnostic method is used for which diseases and in which cases.

Contents of the Course Unit:

Autopsies – performance and reporting; Principles of macroscopic diagnostics; Selection of fixatives and processing; Dyeing and fundamentals of microscopic diagnostics; Histochemical and immunohistochemical diagnostic methods in surgical pathology; Immunofluorescence and electronic microscopy in pathology; Flow cytometry; In situ hybridization and Polymerase Chain Reaction – PCR); Cytopathology; Virtual microscopy; Tissue microarray in pathology; Digital pathology and image analysis; Molecular pathology.

Teaching Methods:

The classes are given in the form of lectures, interactive practicals (macroscopic practicals, autopsies, histology practicals), seminars, midterms, office hours, and independent student work.

Literature:

1. Дај ЕЦ. Хистопатолошке методе и протоколи. Спрингер, 2014.
Кумар В, Аббас АК, Астер ЈЦ. Робинсове основе патологије – Интернационално издање. десето издање. Београд: Датастатус, 2021.
2. Гајанин, Р. и Клем, И. (2004). Приручник за патохистолошке вјежбе за студенте медицине и стоматологије. 1. издање. Бањалука: Д*С.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	5	Oral / Written	55	100
Midterm(s)	30			
Seminar paper	10			
Note for the Course Unit:				
Syllabus Designer: Prof. Dr Radoslav Gajanin				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**National Drug Policy**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	VI	1L+1P	2
Members of Staff	prof. Prof. Ranko Škrbić, Prof. Svjetlana Stoisavljević Šatara, Prof. Lana Nežić, Assist. Prof. Nataša Stojaković, Ana Golić Jelić, senior teaching assistant, Đorđe Đukanović, associate, and Žana Maksimović			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of Study at the integrated study programme.

Goals of the Course Unit

The goal of the course unit is to introduce the students with the legislation on medication, principles of good manufacturing practice (GMP), good distribution practice (GDP), good pharmacy practice (GPP), medication registration with the Agency for Medicinal Products and Medical Devices, system of medication control and quality, pharmaceutical inspection, definition of lists of essential and hospital medication as well as medication covered by the health insurance fund, ways of forming medication prices, provision of information on medication, and monitoring of the use of medication.

Learning Outcomes (knowledge acquired):

The students need to understand the way medication is put on the market, from production, through registration, quality control and distribution to method of delivering or issuing a prescription to a patient. Students will master the legislation principles and ways to form medication prices, manners of forming lists of medication funded by the Health Insurance Fund, and manners of monitoring medication use.

Contents of the Course Unit:

Legislation and organization. Quality, safety and efficiency of medication. Availability of medication. Prices of medication, Lists of medication, Use of medication.

Teaching Methods:

The classes are given in the form of lectures and practicals held in key institutions responsible for implementing the national drug policy. During the classes the students will be able to visit: the Hemofarm pharmaceutical company, BiH Agency for Medicinal Products and Medical Devices, Veldrogerija, Pharmacy, RS Public Health Institute, RS Health Insurance Fund, RS Ministry of Health and Social Welfare.

Literature:

1. **Nacionalna politika lijekova Republike Srpske**, Ministarstvo zdravlja i socijalne zaštite Republike Srpske. . https://www.vladars.net/sr-SP-Cyrl/Vlada/Ministarstva/MZSZ/Documents/Nacionalna%20politika%20lijekova.pdf
2. **Strategija u oblasti lijekova**, Ministarstvo zdravlja i socijalne zaštite Republike Srpske https://www.vladars.net/sr-SP-Cyrl/Vlada/Ministarstva/MZSZ/Documents/Strategija%20u%20oblasti%20lijekova.pdf
3. **Farmakovigilansa i materiovigilansa,** Agenciaj za lijekove i medicinska sredstva BiH. http://www.almbih.gov.ba/farmakovigilansa/
4. **ATC klasifikacija lijekova i praćenje njihove upotrebe metodologijom sa DDD jedinicama za lijekove registrovane u Repubici Srpskoj.** Škrbić R, Marković-Peković V, Stoisavljević-Šatara S, Grubiša N, Tubić B. Agencija z alijekove RS, Banja Luka 2006. (dostupno u bibilitoeci Medicinskog fakulteta).

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**40**			
Seminar paper				

Note for the Course Unit:

Syllabus Designer: Prof. Dr Ranko Škrbić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of **MEDICINE**	

Course Unit Name	**Applied Epidemiology**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	Elective	VI	1L+1P	2
Members of Staff	Janja Bojanić, full professor, Jela Aćimović, senior teaching assistant			

Eligibility Requirements	**Form of Requirements**
Course units from the previous year of study must be passed.	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

Adoption of theoretical knowledge and practical skills in general epidemiology. In the field of hospital-acquired infections, drafting plans and programmes for preventing and curbing hospital-acquired infections to protect health care workers, patients, students and all others who spend time in health care institutions. Proper use of personal protective equipment for health care workers and students, specific protective measures, immunization – mandatory, recommended or in line with epidemiological circumstances, are aimed at reducing the incidence of infectious diseases and hospital-acquired infections. Teamwork, adoption and development of communication knowledge and skills in contact with the patients and their family members, colleagues and medical staff, protection and promotion of patient rights. Stimulation of student research and involvement in projects and scientific and professional papers using methodologies of scientific research. Epidemiology in service of public health is a basic science for acquiring the required broad knowledge and skills in the promotion of health and prevention of disease.

Learning Outcomes (knowledge acquired):

1. Organization of work in preventing and curbing hospital-acquired infections (legislation).
2. Drafting plans and programmes for preventing and curbing hospital-acquired infections.
3. Protection of health care workers and students from hospital-acquired infections.
4. The students are expected to be able to plan and implement specific types of quantitative and qualitative research and to know how to implement different data gathering methods and techniques, as well as to learn to interpret their results.
5. They will also improve previously acquired skills of writing scientific papers and research reports.
6. They will be able to select a topic for a project and to write the project description.
7. Research into cause of disease, health risks, contribution to health care policy.

Contents of the Course Unit:

1. Epidemiological characteristics of hospital-acquired infections
2. Organization of preventing and curbing hospital-acquired infections in the wo and in the Republic of Srpska. (legislation))
3. Protection of health care workers from hospital-acquired infections (personal protective equipment)
4. Immunization of health care workers and patients – mandatory, recommended and in line with epidemiological circumstances
5. Teamwork, acquisition and development of communication skills and professional skills
6. Epidemiology in the practice of public health. New directions of development in epidemiology.
7. Health disorder frequency indicators. Data sources in epidemiology.
8. Causality in epidemiology and the concept of risk
9. Conception of a research paper (research problem; research questons and hypotheses)

10. Types of epidemiology studies. Descriptive epidemiology and descriptive studies.
11. Analytical studies. Experimental studies.
12. Measurement errors in epidemiology studies.
13. Application of epidemiology in evidence-based medicine. Clinical epidemiology
14. Epidemiology of the living environment and epidemiology in emergency situations.
15. Emerging infectious diseases

Practicals

12. Health disorder frequency indicators.
13. Standardization.
14. Causality in epidemiology and the concept of risk.
15. Public health, public health strategies, New public health
16. Immunization (Active immunization. Passive immunization. Cold chain)
17. Sterilization, methods and control.
18. Disinfection, Disinfestation and Deratting
19. Ethics in scientific research – case studies
20. Establishing research problems, hypotheses and goals (working in small groups)
21. Analysis of a published observational study
22. Analysis of a published experimental study
23. Analysis of a published qualitative studies
24. Analysis of a published original paper
25. Drafting abstracts, types of abstracts
26. Research projects – task order (working in small groups)

Teaching Methods:

Lectures, practicals, seminar paper.

Literature:

1. Јанковић С, Мијовић Б, Бојанић Ј, Јандрић Љ. Епидемиологија, II издање,Бања Лука: Медицински факултет, Фоча: Медицински факултет Бања Лука, 2015, (од 9-126 стране)
2. Јанковић С, Мијовић Б, Бојанић Ј, Јандрић Љ, Максимовић Н. Практикум, У: Јанковић С. (уредник). II издање,Бања Лука: Медицински факултет, Фоча: Медицински факултет Бања Лука (од 129-235 страна)
3. Бојанић Ј, Мијовић Б, Аћимовић Ј. Дефиниције интрахоспиталних инфекција. Институт за јавно здравство Републике Српске, 2017.године
4. Мијовић Б. Бојанић Ј. Марић В. Станић С. Хоспитална епидемиологија. Медицински факултет Фоча. 2018.године
5. Бојанић Ј. Мијовић Б. Јавно здравље и епидемиологија у здравственој њези. Медицински факултет Фоча. 2018. године

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**5**	**Oral / Written**		**100**
Attendance to practicals	**5**	**Exam / Written exam / test**	**50**	
Midterm	**30**			
Seminar paper	**10**			

Note for the Course Unit:

The number of points in the Final Exam must be at least 31. The final grade is formed with the following formula:
Attendance to lectures/practicals + midterm + seminar paper + more than half of the points from the Final Exam

Syllabus Designer: Prof. Dr Janja Bojanić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**Pathophysiology of Aging**			
Type of Course Unit	**General Education**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
	ELECTIVE	VI	1L+1P	2
Members of Staff	Prof. Dr Nela Rašeta Simović, full professor Prof. Dr Darko Golić, associate professor			

Eligibility Requirements	**Form of Requirements**
Medical Biochemistry, Medical Physiology	As provided by the Rules of the First-Cycle Studies

Goals of the Course Unit

The goal of this course unit is for third-year medical students to get to know the aging process and to acquire knowledge on the pathophysiological aspects of the aging process.

Learning Outcomes (knowledge acquired):

The purpose of the course unit is to enable the students to understand the physiological and pathophysiological mechanism in the aging process.

Contents of the Course Unit:

Theories on aging, Normal and Diseased Aging, Role of Oxidative Stress in the aging process, Tissue and system aging, Pathophysiological changes of the cardiovascular system in the aging process, Changes of the pulmonary system in the aging process, Changes of the digestive system in the aging process, Aging of the immune system and changes of the distribution of bodily fluids in the aging process, Hormone regulation, reproductive system and aging, Changes of the urinary tract in the aging process, Changes of the musculoskeletal system in the aging process, Pain in old age, Degenerative diseases related to the aging process, and Palliative medicine

Teaching Methods:

The classes are given in the form of lectures, interactive practicals, midterms, office hours, and independent student work

Literature:

Гамулин с, Марушић М, Ковач З. и сар. Патофизилогија. Загреб: Медицинска наклада; 2011.
Белеселин ББ, Јовановић БВ, Недељков ВБ и сар. Специјална патолошка физиологија. Београд: Дата статус; 2008.
Кулаузов М. и сар. Специјална патолошка физиологија. Orthomedics Нови Сад, 2011.
Врховац Б. Интерна медицина.Загреб: Љевак; 2008.

Examination Form:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**
Midterm(s)	**40**			

Note for the Course Unit:

Syllabus Designer: Prof. Dr Darko Golić

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of	**MEDICINE**

Course Unit Name	**ONCOLOGICAL PATHOLOGY**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS**
TO BE DESIGNATED	ELECTIVE	VI	1L+1P	2
Members of Staff	Dr Radoslav Gajanin, full professor, Head of the department; Dr Slaviša Đuričić, associate professor; Dr Aleksandra Salapura, associate professor			

Eligibility Requirements	**Form of Requirements**
Anatomy, Histology and Embryology	These course units must be passed as a requirement for attendance

Goals of the Course Unit

The goal of the course unit is for students to get to know the main characteristics of tumors (clinical, morphological, phenotypical, prognostic). The future physician must be equipped with basic knowledge of oncological pathology, in order to know which diagnostic procedures and parameters are used in pathology, but also to be able to properly interpret and use data provided by the pathologist's report. The Contents of the Course Unit include the study of the most common tumors and the significance of a multidisciplinary approach in the prevention, diagnostics, treatment and monitoring of oncology patients. The range of diagnostic procedure available in pathology is increasing by the day, which means that clinical physicians must be aware of new diagnostic procedures and be able to properly interpret and use them. There are numerous methods that pathology uses to obtain a diagnosis for an oncology patient, and the obtained data is immensely important (macroscopic and microscopic examination, urgent diagnostics, electronic microscopy, in situ hybridization, DNA analysis, cytogenetics, flow cytometry, image analysis, immunohistochemical analysis...).

Learning Outcomes (knowledge acquired):

Having passed the exam, the student will know the basic characteristics of the most common malignant tumors, their incidence, occurrence mechanisms, clinical manifestations, treatment modalities, and prognosis. They will also know which diagnostic procedures are used for early detection of changes that lead to tumors and of tumors themselves. Additionally, they will be capable to interpret results and all parameters which are included in an oncology patient’s medical history.

Contents of the Course Unit:

Introduction to oncological pathology; General characteristics of neoplasia; Tumors of the early age; Tumors of blood vessels and the heart; Tumors of the hematopoietic and lymphatic system; Lung tumors; Tumors of kidneys and the urinary tract; Tumors of the oral cavity, pancreas and gastrointestinal system; Tumors of the liver, gallbladder and bile ducts; Tumors of the male and female genital system; Breast tumors; Tumors of the endocrine system; Skin tumors; Nervous system tumors; Tumors of the bones, joints and soft tissues.

Teaching Methods:

The classes are given in the form of lectures, interactive practicals (macroscopic practicals, autopsies, histology practicals), seminars, midterms, office hours, and independent student work.

Literature:

1. Опрић М. Онколошка патологија. Прво издање. Београд: Медицинска књига 2000.
2. Кумар В, Аббас АК, Астер ЈЦ. Робинсове основе патологије – Интернационално издање. десето издање. Београд: Датастатус, 2021.
3. Гајанин, Р. и Клем, И. Приручник за патохистолошке вјежбе за студенте медицине и стоматологије. 1. издање. Бањалука: Д*С, 2004.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**5**	**Oral / Written**	**55**	**100**
Midterm(s)	**30**			
Seminar paper	**10**			

Syllabus Designer: Prof. Dr Radoslav Gajanin

FOURTH YEAR

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course unit name	**Internal Medicine**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII and VIII	VII: 5 L + 7 P VIII: 5 L + 8 P	27
Members of Staff	Head of the Department: Prof. Snjezana Popovic-Pejicic, PhD, Full Professor, Corresponding Member of the Academy of Arts of the Republic of Srpska; Prof. Dusko Vulic, PhD, Full Professor, Academician; Prof. Sandra Hotic-Lazarevic, PhD, Full Professor; Prof. Aleksandar Lazarevic, PhD, Full Professor; Prof. Zoran Mavija, PhD, Full Professor; Prof. Mirko Stanetic, PhD, Full Professor; Prof. Krsto Jandric, PhD, Full Professor; Prof. Branisla Gasic, PhD, Associate Professor; Prof. Vlastimir Vlatkovic, PhD, Associate Professor; Prof. Tamara Kovacevic-Preradovic, PhD, Associate Professor; Prof. Milorad Grujicic, PhD, Associate Professor; Prof. Aleksandra Markovic, PhD, Associate Professor, Milena Brkic, PhD, Assistant Professor; Bojan Stanetic, PhD, Assistant Professor; Bojana Caric, PhD, Assistant Professor; Ljubinka Bozic-Majstorovic, PhD, Assistant Professor; Ivona Risovic, PhD, Assistant Professor; Gabrijela Malesevic, PhD, Assistant Professor; Valentina Soldat-Stankovic, PhD, TA; Danijela Mandic, MA, TA; Jelena Jovanic, MA, TA.			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

The students are supposed to acquire current theoretical knowledge and practical skills in the field of Internal Medicine and apply them in their professional environment and scientific research. Another important goal is development of critical thinking, viewed as an ability to establish a diagnosis based upon the knowledge and skills acquired, to plan appropriate diagnostic procedures, and to administer proper therapy.

Learning Outcomes (knowledge acquired):

The students will have gained the necessary knowledge from important areas of Internal Medicine, such as: cardiology, pulmonology, nephrology, endocrinology, gastro-enterology and hepatology, haematology, rheumatology, and clinical immunology, as well as the ability to recognise respective diseases from the aforementioned areas and to conduct rational diagnostic procedures and treat them. In addition, the students will have become familiar with major diagnostic characteristic, with clinical manifestations, and with therapy for the most common diseases they are going to encounter in their professional careers. In the end, they will have acquired the ability to produce a diagnosis, to plan further diagnostic procedures, and to administer appropriate therapy.

The students are trained for both individual and teamwork with regard to recognising cardiological, nephrological, endocrinological, gastro-enterological, haematological, and rheumatological diseases, as well as to application of diagnostic and therapeutic algorithms.

Upon the acquisition of current theoretical knowledge and practical skills from the course unit of Internal Medicine, the students will have reached the necessary level of competence, along with professional independence and responsibility, as assessed through midterms and the final exam.

Contents of the Course Unit:

Cardiology, Pulmonology, Nephrology, Endocrinology and Metabolic Diseases, Gastro-Enterology and Hepatology, Haematology, Rheumatology, and Clinical Immunology

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

They are executed as follows:
1. Theoretical Lecture
2. Practical Classes:
   - Practicals;
   - Other Teaching Forms;
   - Research Study.

Literature:

Mandatory
1. Драгољуб Манојловић. Интерна медицина, Завод за уџбенике и наставна средства Београд,1998.
2. Materials from lectures.

Optional
1.Kasper,Fauci.Харисонови принципи интерне медицине (19. издање), Датастатус, Београд, 2021.
2. Fauci,Braunwald. Харисонов приручник интерне медицине (17 издање), Датастатус, Београд, 2016.

Examination Form:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral Exam**	**50**	**100**
Midterms	**40**			
Seminar Paper				

Note for the Course Unit:

Syllabus Designer: Prof. Snjezana Popovic-Pejicic, PhD, Full Professor, Corresponding Member of the Academy of Arts and Sciences of the Republic of Srpska

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course unit name	**Infectious Diseases**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII and VIII	VII: 1L+2 P VIII: 1L+2 P	6
Members of Staff	Prof. Antonija Verhaz, PhD, Full Professors; Tatjana Rogancevic, PhD; Snezana Ritan, PhD; Milan Petrovic, PhD; Zvezdana Vukovic, PhD; Olja Cukovic, PhD			

Eligibility Requirements	**Form of Requirements**
None	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Acquisition of current theoretical knowledge and practical skills in the field of infectious diseases. To get to know students about the importance and spreading of infectious diseases, about their epidemiological characteristics, and about their significance for public health. The focus is on acquisition of knowledge about the clinical chart of infectious diseases, as well as on mastering diagnostic and therapeutic protocols in infectology.
It is necessary to point out the significance of infectious diseases in the light of differential diagnosis, since infectology is an inter-disciplinary field of medicine. For that reason, it is necessary for the students to become familiar with laboratory, microbiological, serological, and other important diagnostic procedures.
In the end, it is necessary for the students to acuire the knowledge in the field of prevention and protection of medical workers from infections.

Learning Outcomes (acquired knowledge):

General Outcomes:

To recognise clinical symptoms and clinical chart of an infectious disease, to produce diagnosis and administer appropriate therapy, to combine the acquired knowledge and skills in a differential diagnosis procedure. The students will have been able to understand the epidemiological significance of infectious diseases and their effect on public health, to recognise urgent conditions in infectology, and to perform triage of patients. In the end, the students will have become familiar with the list of infectious diseases to be reported to the medical authorities and the manner of reporting them, as well as with the application of various isolation measures.
To recognise the significance of emerging and re-emerging infectious diseases. Infectious diseases as a biological weapon.

Specific Outcomes:

The students will have gained knowledge and skills to be applied with the previously acquired clinical knowledge in recognising and interpreting clinical symptoms and signs of infectious diseases and in reading laboratory and microbiological findings with a view to producing a diagnose.
Furthermore, the students will have been able to establish a proper therapy and to apply their knowledge and skills in diagnostics and treatment of infections affecting any organ system in adults and children, as well as in immune-compromised patients. In addition, they will have been able to recognise and resolve the most common infectious conditions at the primary care level and to assess the need for targeted examinations within the area of inter-disciplinary approach.

Contents of the Course Unit:

Respiratory Infections: viral and bacterial infections of the upper respiratory tract – pharyngitis, parainfluenza, adenovirus infections, rhinovirus infections, common cold, streprococcal infections.
Characteristic clinical chart, possibilities of diagnostics, significance of serological diagnostics, swab sampling and findings reading, application of symptomatic treatment and antibiotic therapy.
Influenza: etyology, epidemiology, pathogenesis, clinical chart, diagnosis, and therapy. Pandemic influenza, bird flu, SARS.
Mumps: etyology, epidemiology, pathogenesis, clinical chart of parotitis and meningitis, diagnosis, and therapy.
Pertussis: etyology, epidemiology, pathogenesis, clinical chart, diagnosis and therapy, importance of vaccination, and complications.
Respiratory infections of the lower respiratory tract: typical and atypical
pneumonia.
Herpes Viral Infections: HSV1- and HSV2-infections, CMV- and EBV-infections, clinical chart characteristics, acute infections and reactivations, diagnostics, significance of serological diagnostics, PBD test, other diagnostic possibilities (isolation, PCR test). Application of anti-viral therapy.
Viral rash fevers: chickenpox, morbili, rubeola etc. Etyology, epidemiology, pathogenesis, clinical chart, diagnosis and therapy, importance of vaccination, complications.
Intoxications and infections of digestive tract:viral enterocolitis, bacterial food poisoning, bacillary and amoebic dysentery, typhoid fever, paratyphoid, salmonellosis, cholera (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Liver infections: acute viral hepatitis (A,B,C etc), chronical viral hepatitis and its consequences (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Leptospirosis: (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Anaerobic infections and intoxinations: tetanus, botulism (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Central Nervous System Infections. Meningeal syndrome, lumbar puncture.
Viral meningitis, bacterial meningitis, viral encephalitis, tuberculous meningitis (pathogenesis, clinical chart, diagnosis and therapy, and complications).
Lyme disease (pathogenesis, clinical chart, diagnosis and therapy, and complications).
Sepsis and septic shock (pathogenesis, clinical chart, diagnosis and therapy, and complications).
HIV/AIDS: (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Streptococcal and staphylococcal infections (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Enteroviral infections (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Infections caused by Rickettsia (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Zoonosis: Viral haemorrhagic fevers – Crimean Congo, Marburg, Ebola etc (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Zoonosis: brucellosis, listeriosis, psittacosis etc (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Malaria, leishmania (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Trichinellosis (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Infections in pregnancy (pathogenesis, clinical chart, diagnosis and therapy, and complications)
Intrahospital infections: etyology, epidemiology, diagnosis, and therapy
Practical training: Immediate contact with patient (getting illness history, examination, diagnostics – getting familiar with biological sampling procedures and other diagnostic methods, monitoring of administered therapy as indicated by clinical chart, administering intravenose therapy).
Practicals. Other teaching methods. Research study.

Teaching methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work. During practical training, a student is required to get a history of the illness, to perform a clinical examination of the patient, to plan laboratory and other analyses, and to suggest a therapy protocol.
The students take a 30-item written test in General Infectology. The final exam consists of practical work and an oral exam featuring two questions.

Examination Forms:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Midterms	**10**	**Written and Oral Exams**	**50**	
Seminar Paper	**30**			

Note for the Course Unit:

1. Јосип Беговац и сурадници: Клиничка инфектологија, Медицинска наклада, Загреб, 2018., свеучилишни уџбеник, 1072 стр.
2. Инфективне болести : уџбеник за студенте медицине, 2019, Издавач Медицински факултет Београд
3. Драган Делић . Инфективне болести - дијагностика и терапија, Завод за уџбенике – Београд

Syllabus designer: Prof. Antonija Verhaz, PhD, Full Professor

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course unit name	**Neurology**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit code**	**Semester**	**Class workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII and VIII	VII: 1L +1 PT VIII: 2L + 2 PT	6
Members of Staff	Prof. Vlado Djajic, PhD, Full Professor; Prof. Zoran Vujkovic, PhD, Full Professor; Prof. Sinisa Miljkovic, PhD, Full Professor; Prof. Dusko Racic, PhD, Full Professor; Prof. Sanja Grgic, PhD, Full Professor; Prof. Aleksandra Dominovic Kovacevic, PhD, Full Professor; Prof. Daliborka Tadic, PhD; Zoran Vukojevic, PhD, Assistant Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	None

Goals of the Course Unit:

The students are supposed to acquire knowledge about pathogenetic and pathophysiological mechanisms of the most common neurological diseases, about their respective clinical charts, about diagnostic procedures applied, and about current therapeutic protocols and prognostics.

Learning Outcomes (acquired knowledge):

The students will have been able to establish a diagnosis and determine a proper therapy for the most common neurological diseases, to get a neurological disease history on their own, to perform a neurological examination of the patient, to analyse epidemiology and pathogenetic mechanisms, as well as to recognise the clinical chart of the most common neurological diseases. In addition, the students will independently have been able to design a plan for diagnostic procedures necessary for establishing a diagnosis and administering a proper therapy. They will have been able to recognise urgent neurological conditions and to apply proper medical treatment, as well as to prevent neurological diseases and to master their prognostics.

Contents of the Course Unit:

Consciousness disorder, sleep disorder, epilepsy, headaches, neuralgia, vertigo, cerebrovascular diseases, brain edema, infectious diseases of CNS, dementia, trauma of CNS, tumors of CNS, demyelination diseases of CNS, motion disturbance and cerebellum diseases, nervous system diseases in developing age, neurocutaneous diseases, motor neurone diseases and polyneuropathies, spinal cord diseases, neuromuscular junction and muscular diseases.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Неурологија, Владимир Костић и група аутора, Главни и одговорни уредник:Владимир Костић, Медицински факултет Београд, Београд, 2020.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Practical Midterms	**40**	**Oral Exam**	**50**	

Note for the Course Unit:

Syllabus designer: Prof. Zoran Vujkovic, PhD, Full Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course unit name:	**Psychiatry**			
Type of course unit	**Profesionally Applicative**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII and VIII	VII: 1L+1PT VIII: 1L+2 PT	5
Members of Staff	Prof. Mira Spremo, PhD, Full Professor; Prof. Marija Burgic Radmanovic, PhD, Full Professor; Prof. Milan Stojakovic, PhD, Full Professor; Ivana Ilic Kundacina, PhD			

Eligibility Requirements	**Form of Requirements**
None	

Goals of the Course Unit:

The students are supposed to identify, diagnose, and administer a proper therapy to patients with mental disorders, and they are provided with an opportunity to participate in research projects, in order to become familiar with the methodology of research in psychiatry.

Learning Outcomes (acquired knowledge):

The students acquire knowledge about psychiatry as a medical field, they understand and are familiar with characteristics of respective mental disorders as classified by WHO (ICD-10), and they can perform diagnostic procedures of mental procedures and treat them accordingly.
The students will have been able to conduct a psychiatric interview, to assess psychic functions and behaviour of persons with various mental disorders, to establish a diagnosis (working and differential diagnosis), and to choose appropriate psycho-pharmacotherapy and psychotherapy for a patient.

Contents of the Course Unit:

Psychiatric disorders through history, development of psychiatry as a medical branch, psychiatry in contemporary medicine. Classification and diagnostics of mental disorders (ICD-10). General psychopathology (consciousness disorders, perception, thinking, will, emotions, attention, intelligence, memory). Etyology of mental disorders. Treatment of mental disorders. Classification of psychotropic drugs. Psychotherapy. Organic mental disorders – acute and chronical. Mental disorders and disorders of behavior due to usage of psychoactive substances. Schizophrenia, schizotypal personality disorder, and insanity disorders. Mood disorders. Neurotic disorders, stress-related disorders, somatoform disorders. Suicidality. Psychosomatic medicine and consultative psychiatry. Personality disorders. Mental disorders in children. Mental disorders in adolescents. Urgent conditions. Fundamentals of forensic psychiatry. Sociotherapy. Organisation of psychiatric service.

Teaching methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Психијатрија: Мирослава Јашовић Гашић, Душица Лечић Тошевски, Медицински Факултет, Универзитет у Београду, 2014.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Midterms	**30**	**Oral/Written**	**50**	
Seminar Paper	**10**			

Note for the Course Unit:

Syllabus designer: Prof. Mira Spremo, PhD, Full Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course unit name	**Dermatovenerology**			
Type of course unit	**Стручно апликативни**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII	2L+2P	4
Members of Staff	Prof. Bogdan Zrnic, PhD, Full Professor – Head of Department; Djuka Ninkovic Baros, PhD, Assistant Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

The students are introduced to dermatovenerological pathology and to basic principles of diagnostic and therapeutic procedures in dermatovenerological patients

Learning Outcomes (acquired knowledge):

The students will have been able to identify changes on skin related to the most common skin diseases, to assess the gravity of the disease, to perform triage and level of urgency, as well as to determine the method of treatment of dermatological patient. The students will have been able to master diagnostic procedures related to the most common dermatological diseases, as well as those related to mycological diagnostics, to allergological testing, to dermatoscopy of skin cancers, to biopsy of skin lesions, and to diagnostics of sexually-transmitted diseases.
In the end, the students will have been able to apply their knowledge with a view to therapeutic procedures as regards the most common dermatovenerological diseases.

Contents of the Course Unit:

Structure of skin and skin appendages. Pathological changes on skin (efflorescence). The function of skin. Basic principles underlying establishing a skin disease diagnose. The most common diagnostic procedures in dermatovenerology. Therapy in dermatovenerology. Diseases caused by micro-organisms (viral, fungal, bacterial), parasitic diseases, allergic diseases, dermatitis (dyshidrotic eczema, nummular eczema, irritant contact dermatitis, infectious eczema, atopic dermatitis). Collagen vascular diseases. Autoimmune bullous dermatosis. Purpura and vasculitis. Pruritus and prurigo. Eritrodermia. Papulosquamous diseases. Diseases of skin appendages (hairs, nails, and glands). Neurocutaneous diseases. Circulatory skin diseases. Skin tuberculosis. Nodose dermatosis. Lyme borreliosis. Skin tumors, nevi, pre-cancer skin diseases. Changes affecting the mucous membrane of mouth cavity related to dermatological diseases. Skin manifestations of multi-system diseases. Sexually-transmitted diseases (diagnostics and treatment). Dermatovenerological diseases in pregnancy. Psychodermatology.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Зрнић Б. (2012). Дерматовенерологија, Медицински факултет Универзитета у Бањој Луци

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral Exam**	**50**	**100**
Midterms	**20**			
Practical Exam	**20**			

Note for the Course Unit:

Syllabus designer: Prof. Bogdan Zrnic, PhD, Full Professor

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**Medicine**

Course unit name	**Radiology**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII	2L +2P	4
Members of Staff	Prof. Sasa Vujnovic, PhD, Full Professor; Prof. Dragan Stojanov, PhD, Full Professor; Prof. Sladjana Petrovic, PhD, Full Professor; Prof. Djordjije Saranovic, PhD, Full Professor; Prof. Milos Lucic, PhD, Full Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Acquiring knowledge about radiological modalities, about protection against radiation, and about methods of radiological examinations of respective organ systems and anatomical regions. Acquiring knowledge about radiological anatomy, as well as about basic pathological findings and interventional radiological techniques.

Learning Outcomes (acquired knowledge):

The students will have been able to understand how radiological devices operate and to use radiological protective equipment properly. They will have been introduced to techniques of radiological examinations, to positioning patients, and to using contrast agents. In addition, they will have been to independently interprete basic pathological processes gained by means of radiographic, CT, and MR imaging of musculoskeletal, respiratory, cardio-vascular, gastro-intestinal, and genito-urinary systems, as well as of abdominal tract, breasts, and CNS. The students will have been able to use the acquired knowledge to choose an appropriate radiological examination for respective diseases and clinical conditions and to assess what interventional radiological methods yield the best results concerning respective pathological conditions.

Contents of the Course Unit:

Theoretical lectures:

Fundamentals of radiological devices. Protection from radiation. Methods of radiological examinations of respective organ systems. Manner of preparation of patient, performance technique, indications and counter-indications for certain radiological examinations. Fundamentals of vascular and non-vascular interventional radiology. Radiological anatomy and basic pathological findings. Algorithms of radiological examinations.

Practicals:

Introduction to radiological devices and radiological information system. Introduction to examination techniques of respective organ systems and to basic pathological findings. Introduction to and observation of basic vascular and non-vascular interventional radiological procedures. Practising radiological anatomy and basic pathological findings by means of collection of videos.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Практикум клиничке радиологије: за студенте медицине, 3. измењено и допуњено издањеПетар Бошњаковић, Драган Стојанов,Зоран Радовановић,Слађана Петровић. Дата Статус, Београд 2016.
2. Основи радиологије : Клиничка слика, патофизиологија,имицинг, 3.издање, Ричард Гундерман, Дата Статус, Београд 2016.

Examination Forms:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral/Written**	**50**	**100**
Midterms	**25**			
Seminar Paper	**15**			
Note for the Course Unit:				
Syllabus designer: Prof. Sasa Vujnovic, PhD, Full Professor				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course unit name	**Nuclear Medicine**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ОБАВЕЗНИ	VIII	1L+1P	2
Members of Staff	Prof. Vera Artiko, PhD, Full Professor; Prof. Dragana Sobic-Saranovic, PhD, Full Professor; Sinisa Stankovic, MA, Senior Teaching Assistant; Jasenka Mijatovic, PhD, Expert Associate			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Acquiring knowledge about operating open sources of radiation, about radioactive isotopes, about characteristics and preparation of isotopes applied in nuclear medicine, in generators, in radio-pharmaceuticals, in instrumentation, in protection measures concerning open sources of radiation, in radio-isotopes and radio-pharmaceuticals in diagnostics and 'in vitro' therapy.

Learning Outcomes (acquired knowledge):

Understanding basic principles of nuclear medicine.
The students will have gained basic knowledge about operating open sources of radiation, about preparations for clinical application of radio-isotopes and radio-pharmaceuticals, about operating nuclear medicine devices, about acquisition, processing, and interpretation of data, about application of protective measures, and about proper management of patient during a procedure.
In the end, students will have gained knowledge about performing diagnostic and therapeutic nuclear medicine procedures and their clinical application.

Contents of the Course Unit:

Introduction to Nuclear Medicine
Radioactivity and Radioactive Decay, Isotopes
Open Sources of Radiation
Physiological Foundations of Radionuclides Application
Radiopharmaceuticals
Production of Isotopes Applied in Nuclear Medicine, Generators
Protection against Radiation, Contamination, and Decontamination
Principles of Radiation Detection
Instrumentation in Nuclear Medicine
Gamma Camera, SPECT (Single Photon Emission Computed Tomography)
Nuclear Medicine in Endocrinology
Nuclear Medicine in Cardiology and Pulmonology
Nuclear Medicine in Oncology
Nuclear Medicine in Nephro-Urology and Gastro-Enterology
Nuclear Medicine in Neurology and Pediatrics
Application of Nuclear Medicine in Other Fields of Medicine
PET (Positron Emission Tomography)
Fundamentals of Radionuclide Therapy

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Хан Р и група аутора. (2009) Нуклеарна медицина. Медицински факултет Универзитета у Београду
2. Metller F, Guiberteau M. (2012) Essentials of Nuclear Medicine Imaging. Saunders

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**30**			**100**
Midterms	**20**	**Oral/Written**	**50**	
Seminar Paper				

Note for the Course Unit:

Syllabus designer: Sinisa Stankovic, MA, Senior Teaching Assistant

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course unit name	**Ultrasound Diagnostics**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	COMPULSORY	VII	1L +1P	2
Members of Staff	Prof. Sasa Vujnovic, PhD, Full Professor; Prof. Dragan Stojanov, PhD, Full Professor; Prof. Sladjana Petrovic, PhD, Full Professor; Prof. Djordjije Saranovic, PhD; Prof. Milos Lucic, PhD, Full Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Acquisition of knowledge from ultrasound diagnostics that will enable students to understand how images are created. Independent performance regarding ultrasound examinations of various organs and organ systems. Knowledge about ultrasound anatomy and knowledge of basic pathological findings. Independent performance concerning basic ultrasound-guided interventional radiological procedures.

Learning Outcomes (acquired knowledge):

The students will have been able to understand how ultrasound devices operate and introduced to ultrasound examinations techniques. The students will have mastered independent performance as regards ultrasound examinations and been able to independently interpretebasic pathological processes of abdominal organs, pelvic organs, and the neck.

Contents of the Course Unit:

Theoretical Lectures:

Parts of ultrasound devices. Physics of ultrasound. History of development of and current types of ultrasound devices. Types and sorts of ultrasound sondes. B-Mode ultrasound, M-Mode ultrasound, Doppler ultrasound, Colour Doppler ultrasound, Power Doppler ultrasound. Preparation of patient for examination of various organ systems. Specific features of ultrasound examination in pediatric patients. Positioning of patients for certain ultrasound examinations. Techniques of performing percutaneous and intra-cavity ultrasound examination. Ultrasound-guided interventional procedures.

Practicals:

Operating ultrasound devices of various producers. Preparation of patients for various ultrasound examinations. Positioning of patients for various ultrasound examinations. Observation and independent performance of ultrasound examinations. Fundamentals of operating Doppler mode. Ultrasound-guided interventional procedures.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Практикум клиничке радиологије: за студенте медицине, 3. измењено и допуњено издањеПетар Бошњаковић, Драган Стојанов,Зоран Радовановић,Слађана Петровић. Дата Статус, Београд 2016.
2. Основи радиологије : Клиничка слика, патофизиологија,имицинг, 3.издање, Ричард Гундерман, Дата Статус, Београд 2016.
3. Ultrasound for Primary Care Hardcover – Illustrated,Dr. Paul Bornemann 2020, LWW Lippincott Williams and Wilkins

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**	**Oral / Written**	**50**	**100**

Midterms	**25**			
Seminar Paper	**15**			

Note for the Course Unit:

Syllabus designer: Prof. Sasa Vujnovic, PhD, Full Professor

UNIVERSITY OF BANJA LUKA
FACULTY OF MEDICINE

UNDERGRADUATE STUDIES

Study Programme of: **MEDICINE**

Course unit name	**Examination of Patient with Congenital Heart Disease**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ELECTIVE	VII	1L+1P	2
Members of Staff	Prof. Dusko Vulic, PhD, Academician; Prof. Milovan Bojic, PhD, Full Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Introduction of the students to pathogenetic foundation of congenital heart diseases, in particular their clinical symptomatology. Providing basic features of examination of congenital heart disease patient.

Learning Outcomes (acquired knowledge):

The students will have been able to describe clinical symptomatology and master the examination of congenital heart disease patient.

Contents of :

1.Pathogenetic Foundation of Congenital Heart Disease Patient
2.Clinical Symptomatology of Congenital Heart Disease Patient
3.Clinical Finding of Congenital Heart Disease Patient
4.Diagnostics and Treatment of Congenital Heart Disease Patient

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1.Ђорђевић СБ,Кањух В,:Урођене срчане мане,Београд,1978,Антић Р:Интерна пропедевтика,Београд,2008,
2. Мират Ј,Ћорић В,:Болести срчаних залистака,Загреб, 2011.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	10			
Midterms		**Oral / Written**	50	**10**
Seminar Paper	40			**0**

Note for the Course Unit:

Syllabus designer: Prof. Dusko Vulic, PhD, Academician

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course unit name	**Diagnostic-Therapeutic Novelties in Neurology**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
	ELECTIVE	VII	1L +1P	2
Members of Staff	Prof. Vlado Djajic, PhD, Full Professor; Prof. Zoran Vujkovic, PhD, Full Professor; Prof. Sinisa Miljkovic, PhD, Full Professor; Prof. Dusko Racic, PhD, Full Professor; Prof. Sanja Grgic, PhD, Full Professor; Prof. Aleksandra Dominikovic Kovacevic, PhD, Full Professor; Prof. Daliborka Tadic, PhD, Full Professor; Zoran Vukojevic, PhD, Assistant Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	None

Goals of the Course Unit:

The students are introduced to the latest diagnostic techniques, protocols, and guidebooks used in treatments of neurological diseases, as well as to the latest therapeutic procedures used in treatment of the aforementioned diseases.

Learning Outcomes (acquired knowledge):

Introduction of the students to the latest diagnostic and therapeutic procedures in treatment of neurological diseases and to the latest diagnostic techniques and enabling them to apply diagnostic criteria used in establishing diagnosis for the most common neurological diseases. In addition, the students will have mastered fundamental knowledge about and method of application of the latest therapy in neurological diseases and its most common complications, as well as methods of treating therapy complications.

Contents of the Course Unit:

Novelties in diagnostics of brain infarction. Ultrasound of blood vessels of head and neck. Neurosonology. Novelties in brain infarction therapy. Intravenous trombolisis. Interventional recanalisation of cerebral blood vessels. Novelties in diagnostics and therapy cerebral hemorrhages. Novelties in epilepsy treatments. Electroencephalography, electromyoneurography, evoked potentials. Polysomnography. Novelties in multiple sclerosis therapy. Immunoelectrophoeresis of cerebrospinal liquid. Novelties in dementia therapy.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

- Владимир Костић и група аутора, Неурологија, Медицински факултет Београд, Београд, 2020.
- Миљковић Синиша, Вујковић Зоран. Тромболитичка терапија. Медицински факултет Универзитета у Бањалуци, Бањалука 2017.
- Миљковић Синиша, Вујковић Зоран, Ђајић Владо. Примарна и секундарна превенција инфаркта мозга. Медицински факултет Универзитета у Бањалуци, Бањалука 2017.
- Сања Гргић. Мултипла склероза и значај изоелектричног фокусирања ликвора.Медицински факултет Универзитета у Бањој Луци, Бањалука 2019.
- Доминовић-Ковачевић Александра.Амиотрофична латерална склероза. Медицински факултет Универзитета у Бањој Луци, Бањалука 2019.
- Тадић Даліборка. Мултипла склероза и коморбидитети. Медицински факултет Универзитета у Бањој Луци, Бањалука 2020.
- Рачић Душко. Васкуларна деменција. Медицински факултет Универзитета у Бањој Луци, Бањалука 2020.

Examination Forms:

Pre-Exam Duties	Final Exam	Total Points

Attendance	**10**			**100**
Seminar Paper	**40**	**Oral exam**	**50**	
Note for the Course Unit:				
Syllabus designer: Prof. Zoran Vujkovic, PhD, Full Professor				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course unit name	**Infectious Diseases and Biological Mechanisms**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ELECTIVE	VII	1L+1P	2
Members of Staff	Prof. Antonija Verhaz, PhD, Full Professor; Tatjana Roganovic, MSc; Snezana Ritan, PhD; Milan Petrovic, PhD			

Eligibility of Requirements	**Form of Requirements**
None	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

The course unit focuses on acquisition of knowledge about clinical chart of infectious diseases, about recognition of clinical syndromes, as well as about mastering diagnostic and therapeutic protocols in infectology.
A differential diagnosis approach to infectious diseases, an interdisciplinary approach. Introduction to laboratory, microbiological, serological, and other diagnostic procedures important for infectology. General and specific prevention of infectious diseases.

Learning Outcomes (acquired knowledge):

General Outcomes:

Knowledge about pathogenesis, recognition of clinical symptoms and of clinical chart of an infectious diseases. Establishing a diagnosis and administering appropriate therapy, combining acquired knowledge and skills in a differential diagnosis process.

Specific Outcomes:

The students acquire knowledge and skills that they combine with the previously acquired clinical knowledge regarding observation and interpretation of clinical symptoms and signs of infectious diseases andinterprete laboratory, microbiological, and other findings with a view to establishing a diagnosis.
The students administer rational therapy. It is very important that the students recognise infectious diseases, as well as master differential diagnosis tools in order to identify similar diseases.

Contents of the Course Unit:

Pathogenetic mechanisms in infectious diseases: viral and bacterial of upper and lower respiratory tract, central nervous system infections, intestinal tract infections, viral hepatitis, zoonosis, viral herpes infections with regard to latent infections.
Sepsis and septic shock. HIV and AIDS (pathogenesis, clinical chart, diagnosis and therapy, complications)

Practicals:

Immediate care of the patient: taking history of disease, examination of the patient, diagnostics (introduction to procedures of biological samples taking and other diagnostic methods, overview of applied therapy from clinical charts, application of intramuscular and intravenous therapy)

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**20**			**100**
Midterms	**0**	**Oral**	**50**	
Seminar Paper	**30**			

Literature:

1. Јосип Беговац и сурадници: Клиничка инфектологија, Медицинска наклада, Загреб, 2018., свеучилишни уџбеник, 1072 стр.
2. Инфективне болести : уџбеник за студенте медицине, 2019, Издавач Медицински факултет Београд
3. Драган Делић . Инфективне болести - дијагностика и терапија, Завод за уџбенике – Београд

Syllabus designer: Prof. Antonija Verhaz, PhD, Full Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course unit name	**Mental Health in Community**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ELECTIVE	VIII	1L+1P	2
Members of Staff	Prof.Marija Bursac Radmanovic, PhD, Full Professor; Prof. Milan Stojakovic, PhD, Full Professor; Prof. Mira Spremo, PhD, Associate Professor; Ivana Ilic Kundacina, PhD			

Eligibility Requirements	**Form of Requirements**
None	

Goals of the Course Unit:

The course unit aims at promoting mental health in community, that is, creating promotional campaigns with a view to raising awareness about the significance of mental health, as well as launching anti-stigma programmes meant for general population, by which a better understanding of mental disorders, their early diagnostics, and reduction of discrimination against such patients are enabled. Overall, this leads to a more precise diagnosis of a mental disease.

It also focuses on introduction of the students to modes of teamwork and mutual concern about the patient, to application of the coordinated concern technique, which includes needs assessment of the patient, risk assessment, risk management plan, and crisis plan. Other goals concern the issues of inclusion of disabled persons, of understanding tasks of an education assistant, of the necessity of opening workshops predominantly employing disabled persons and of providing social housing to disabled persons, of adopting theoretical and practical knowledge regarding short therapeutic interventions (education provided to patients and their families, relaxation techniques, and problem solving techniques)

Learning Outcomes (acquired knowledge):

The students will have been able to describe and implement basic principles of mental disorders treatment in community, that is, in the environment in which the patient lives and participate in implementation of preventive p and psycho-education programmes, to understand the significance of teamwork and ways of communication in a team, and to use short therapeutic interventions (education provided to the patient and their family, relaxation techniques, and problem solving techniques).

Contents of the Course Unit:

Introduction to and definition of mental health in community, teamwork, inclusion of disabled persons into system of education and job market, role of teacher's assistants, workshops predominantly employing disabled persons and providing social housing to disabled persons. Risk assessment (suicide, nutrition disorders, self-neglection and submission, abuse of substances, aggressiveness), risk plan, coordinated concern treatment, psycho-education programme for the patient and their family, autogenic training and relaxation techniques, individual or group problem solving techniques, recognition of early signs of psychic disorder, mental disorders prevention programmes, stigma, needs assessment of the patient, crisis plan.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Координисана брига, Т. Поповић, Б. Лакић, С. Јовановић, Ђ. Хасечић, Медицински факултет, Универзитет у Бањалуци, 2014.

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**			**100**
Midterms		**Oral / Written**	**50**	

Seminar Paper	**40**			
Note for the Course Unit:				
Syllabus designer: Prof. Mira Spremo, PhD, Full Professor				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course unit name	**PANDEMIC IN INFECTOLOGY**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ELECTIVE	VIII	1L+1P	2
Members of Staff	Prof. Antonija Verhaz, PhD, Full Professor; Tatjana Roganovic, MSc; Snezana Ritan, PhD; Milan Petrovic, PhD			

Eligibility Requirements	**Form of Requirements**
None	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Acquisition of current theoretical knowledge and practical skills in the field of genral and special infectology. Introduction to all aspects of a pandemic and description of its influence on health of general population and on social community.
Emergence of infectious diseases during elemental disasters.
The COVID-19 pandemic is a reminder of the fact that infectious disesases do not respect borders. Each and every country in the world is vulnerable in this regard, no matter how financially successful or how well organised in terms of healthcare sector.

Learning Outcomes (acquired knowledge)

General Outcome:
In order for the influence of the COVID-19 pandemic on the respective healthcare sector to be minimised, both medical and non-medical aspects of a pandemic should be observed.
Specific Outcomes:
The students will have gained knowledge and skills necessary to master diagnostic and therapeutic algorithms, and they will have been introduced to the clinical chart of the COVID-19, as well as with the post-COVID-19 syndrome. In addition, they will have been introduced to novelties in anti-viral and immune-modular therapy and to the attitude towards innovative vaccines.

Contents of the Course Unit:

Respiratory infections: viral and bacterial infections of upper respiratory systems (characteristics of clinical chart, possibilities of diagnostics, significance of serological diagnostics, swab sampling and interpretation of findings, application of symptomatic and antibiotic therapy).
Influenza: etyology, epidemiology, pathogenesis, clinical chart, diagnosis, and therapy. Pandemic influenza, avian influenza, SARS.
Respiratory infections of lower respiratory systems: typical and atypical pneumonia.
COVID-19
Practicals: Immediate care of the patient in the COVID-19 ward.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**20**			**100**
Midterms	**0**	**Oral/Written**	**50**	
Seminar Paper	**30**			

Literature:

1. Терапијски водичи Републике Српске и смјернице земаља у региону.
2. Јосип Беговац и сурадници: Клиничка инфектологија, Медицинска наклада, Загреб, 2018., свеучилишни уџбеник, 1072 стр.
3. Инфективне болести : уџбеник за студенте медицине, 2019, Издавач Медицински факултет Београд
4. Драган Делић . Инфективне болести - дијагностика и терапија, Завод за уџбенике – Београд

Syllabus designer: Prof. Antonija Verhaz, PhD, Full Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course unit name	**Current Trends in Diagnostics and Therapy of Diabetes**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ELECTIVE	VIII	1L+1P	2
Members of Staff	Проф.др Сњежана Поповић-Пејичић, Доц.др Габријела Малешевић, асист. др сц. Валентина Солдат Станковић, доц др Ивона Рисовић, доц. др Бојана Царић Prof. Snjezana Popovic-Pejicic, PhD, Full Professor; Gabrijela Malesevic, PhD, Assistant Professor; Valentina Soldat Stankovic, PhD; Ivona Risovic, PhD, Assistant Professor; Bojana Caric, PhD, Assistant Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Introduction of students to the pathogenetic foundation of diabetes, to the clinical symptomatology, to diagnostics, and to current trends in treatment of the disease.

Learning Outcomes (acquired knowledge):

The students will have gained knowledge about major diagnostic characteristics, about clinical chart, and about therapy of diabetes.
In addition, they will have been trained in individual and teamwork as regards application of diagnostic and therapeutic algorithms in diabetes treatment, as well as in scientific research in the field of diabetology.

Contents of the Course Unit:

1.Pathogenetic Foundation of Type 1 and 2 Diabetes
2.Clinical Symptomatology of Diabetes
3.Diagnostics and Screening of Chronical Complications
4.Current Trends in Therapy of Diabetes

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Монографија „Савремени ставови у лијечењу дијабетес мелитуса типа 2“ аутора Сњежане Поповић-Пејичић и сарадника
2. Kasper,Fauci.Харисонови принципи интерне медицине (19. издање), Датастатус, Београд, 2021.

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	10			**100**
Midterms		**Oral/Written**	50	
Seminar Paper	40			

Note for the Course Unit:

Syllabus designer: Prof. Snjezana Popovic Pejicic, PhD, Full Professor

UNIVERSITY OF BANJA LUKA
FACULTY OF MEDICINE

UNDERGRADUATE STUDIES

Study Programme of:	**MEDICINE**

Course unit name	**Public Health**			
Type of course unit	**General Education**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	VII	1П+1В	2
Members of Staff	Prof. Janja Bojanic, PhD, Full Professor; Nina Rodic Vukmir, PhD, Assistant Professor; Jela Acimovic, MSc, Senior Teaching Assistant; Jelena Devic Djakovic, BSc, Expert Associate			

Eligiiblity Requirements:	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

1. Personal development of a student, establishment of a wide basis of knowledge, and encouragement of scientific research.
2. Development of public health competences, explanation of, classification of, and acceptance of basic fields of knowledge in public health and principles of public health ethics.
3. Development of communication skills as regards patients, colleagues, and medical staff.
4. Design of action plan of public health campaign and social-marketing approach to community

Learning Outcomes (acquired knowledge):

1. Ability to define governing principles of public health
2. Acceptance of public health ethics, values, and attitudes upon which public health perspective rests (New public health).
3. Recognition of basic fields of public health research.
4. Significance of health promotion and of prevention of infectious and mass non-infectious diseases

Contents of the Course Unit:

1. Public health. Health and quality of life. 'Health for all in 21st century' concept and strategy.
2. Epidemiology in public health practice. (Assessment of health in social community. Investigation into cause of disease. Health risks. Contribution to health policy)
3. Public health (Public health strategies. Public health areas. New public health)
4. Health promotion. Health education. Designing plans and programmes of health protection.
5. Communication in healthcare system. Health protection and factors affecting exercising health protection. Organisation of healthcare service.
6. Methodology for prevention and control of mass non-infectious diseases.
7. Health protection financing. Healthcare system reforms.
8. Prevention (Principles nad levels of protection. Promotion of health. General and specific preventive measures. Strategy of preventive activities)
9. Prevention and control of infectious diseases.
10. Mandatory immunisation and immunisation in in international transportation.
11. Epidemiology of nosocomial infections.
12. Microbiological validity of water and of food provisions and alimentary toxic infections
13. Sterilisation and disinfection in microbiology.
14. Hygienic removal of medical and communal waste.
15. Design of action plan of public health campaign and social-marketing approach to community.

Practicals:

1. Indicators of health disorders frequency
2. Basic determinants of health
3. Standardisation
4. Risk concept, health risks
5. Public health policies and strategies
6. Public health areas
7. New public health and unique health concept
8. Public health trends analysis and diseases of the past and of the future
9. Natural course of a disease. Disposition and collective immunity.
10. Direct and indirect ways of spreading infectious diseases
11. Mandatory immunisation and immunisation in international transportation
12. Communication with a patient, types and culture of communication, providing information to a patient.
13. Team and team work
14. Health risks, leading global health risks
15. Long-term development goals

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Јанковић С, Мијовић Б, Бојанић Ј, Јандрић Љ. Епидемиологија, II издање,Бања Лука: Медицински факултет, Фоча: Медицински факултет Бања Лука, 2015, (од 9-126 стране)
2. Јанковић С, Мијовић Б, Бојанић Ј, Јандрић Љ, Максимовић Н. Практикум, У: Јанковић С. (уредник). II издање,Бања Лука: Медицински факултет, Фоча: Медицински факултет Бања Лука (од 129-235 страна)
3. Бојанић Ј, Мијовић Б, Аћимовић Ј. Дефиниције интрахоспиталних инфекција. Институт за јавно здравство Републике Српске, 2017.године
4. Мијовић Б. Бојанић Ј. Марић В. Станић С. Хоспитална епидемиологија. Медицински факултет Фоча. 2018.године
5. Бојанић Ј.Мијовић Б. Јавно здравље и епидемиологија у здравственој њези. Медицински факултет Фоча. 2018. године

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**			**100**
Midterms	**30**	**Written/Test**	**50**	
Practicals	**10**			

Note for the Course Unit:

Minimal score at final exam is 31 points. Final grade is a sum of all pre-exam duties listed.

Syllabus designer: Prof. Janja Bojanic, PhD, Full Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course unit name	**Abdominal Radiology**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	MANDATORY	VIII	1L +1P	2
Members of Staff	Prof. Sasa Vujnovic, PhD, Full Professor; Prof. Dragan Stojanov, PhD, Full Professor; Prof. Sladjana Petrovic, PhD, Full Professor; Prof. Djordjije Saranovic, PhD, Full Professor; Prof. Milos Lucic, PhD, Full Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with I Cycle Academic Studies Rules of Studying

Goals of the Course Unit:

Acquisition of knowledge about radiological modalities and methods of radiological examinations of abdominal organs. Acquisition of knowledge about radiological anatomy as well as about basic pathological findings and interventional radiological techniques.

Learning Outcomes (acquired knowledge):

The students will have been able to independently perform and interprete ultrasound findings of abdominal organs and their respective blood vessels, intreoduced to protocols and techniques of interpretation of CT examinations of upper abdomen (MPR, MIP, MinIP, VR). The students will have mastered protocols and techniques of interpretations of MR findings of upper abdomen and techniques of image processing (MPR, MIP, MinIP, VR). The students will have been able to independently interprete basic pathological processes rendered through ultrasound, radiographic, CT, and MR examinations of abdominal groups.

Contents of the Course Unit:

Theoretical Lectures:

Clinical presentation of the most common diseases of abdominal parenchymal organs and basic treatment principles. Anatomy of abdomen with emphasis on parenchymal organs, as displayed on CT, ultrasound, and MR findings. Recognition of abdominal trauma and acute conditions of parenchymal organs. Inflammatory diseases of abdominal parenchymal organs. Neoplastic diseases of abdominal parenchymal organs. Obstructive and inflammatory diseases of biliary tract. Interventional procedures on abdominal organs.

Practicals:

to examination techniques of abdominal organs, practical work included, and introduction to basic pathological findings. Independent performance of ultrasound abdominal examinations. Introduction to and observance of non-vascular interventional radiological procedures. Training as regards radiological anatomy of abdominal organs and basic pathological findings by vitue of collection of video footage.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Практикум клиничке радиологије: за студенте медицине, 3. измењено и допуњено издањеПетар Бошњаковић, Драган Стојанов,Зоран Радовановић,Слађана Петровић. Дата Статус, Београд 2016.
2. Основи радиологије : Клиничка слика, патофизиологија,имицинг, 3.издање, Ричард Гундерман, Дата Статус, Београд 2016.
3. Компјутеризована томографија абдомена и карлице, Уредник Сања Стојановић , Медицински факултет Нови Сад, 2015.

Examination Forms:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Midterms	**25**	**Oral / Written**	**50**	
Seminar Paper	**15**			
Note for the Course Unit:				
None				
Syllabus designer: Prof. Sasa Vujnovic, PhD, Full Professor				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study programme of: **MEDICINE**	

Course unit name	**Urgent conditions in neurology**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
TO BE DESIGNATED	ELECTIVE	VIII	1L +1P	2
Members of Staff	Prof. Vlado Djajic, PhD, Full Professor; Prof. Zoran Vujkovic, PhD, Full Professor; Prof. Sinisa Miljkovic, phD, Full Professor; Prof. Dusko Racic, PhD, Full Professor; Prof. Sanja Grgic, PhD, Full Professor; Prof. Aleksandra Dominovic Kovacevic, PhD, Full Professor; Prof. Daliborka Tadic, PhD, Full Professor; Zoran Vukojevic, PhD, Assistant Professor			

Eligibility Requirements	**Form of Requirements**
None	

Goals of the Course Unit:

The course unit aims at introducing the students to urgent conditions in neurology, as well as at providing them with knowledge to establish proper diagnosis of urgent conditions and administer therapy.

Learning Outcomes (knowledge acquired):

The students will have gained knowledge about the emergency neurological conditions (causes, pathophysiological mechanisms, and clinical chart), will have been able to independently perform a diagnostic procedure and decide upon which tests must be conducted immediately, will have gained knowledge as regards interpretation of urgent tests, and will have been able to apply adequate therapywith a view to stabilising vital functions, to reducing complications, and to reducing death rate.

Contents of the Course Unit:

Establishing the diagnosis of an acute brain infarction; intravenous thrombolysis protocol; deciding upon the dosage of recombinant tissue plasminogen; intravenous thrombolysis complications; treatment of intravenous thrombolysis complication; subarachnoid hemorrhage; establishing the diagnosis of subarachnoid hemorrhage; treatment of subarachnoid hemorrhage; types of epileptic status; establishing the diagnosis of epileptic status; application of epileptic status therapy; myasthenic crisis; establishing the diagnosis of myasthenic crisis; myasthenic crisis therapy, and neuralgia therapy.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

- Владимир Костић и група аутора, Неурологија, Медицински факултет Београд, Београд, 2020.
- Миљковић Синиша, Вујковић Зоран. Тромболитичка терапија. Медицински факултет Универзитета у Бањалуци, Бањалука 2017.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Seminar Paper	**40**	**Oral Exam**	**50**	

Note for the Course Unit:

Syllabus Designer: Prof. Zoran Vujkovic, PhD, Full Professor

FIFTH YEAR

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course unit name	**Surgery**			
Type of course unit	**Applied Professional**			
Course unit code	**Course unit status**	**Semester**	**Class Workload**	**Number of ECTS credits**
		IX and X	IX: 4L + 6P X: 5L + 8P	23
Staff	Prof. Milan Simatovic, PhD, Full Professor; Prof. Dusko Vasic, PhD, Full Professor; Prof. Darko Lukic, PhD, Full Professor; Prof. Mirko Rakovic, PhD, Full Professor; Prof. Dragan Kostic, PhD, Full Professor; Prof. Snjezana Milicevic, PhD, Full Professor; Prof. Bozo Krivokuca, PhD, Full Professor; Prof. Jovan Culum, PhD, Full Professor; Prof. Sinisa Maksimovic, PhD, Full Professor; Prof. Darko Golic, PhD, Full Professor; Prof. Darko Jovic, PhD, Full Professor; Prof. Vesna Ivanisevic, PhD, Full Professor; Prof. Goran Talic, PhD, Full Professor; Prof. Zoran Aleksic, PhD, Full Professor; Prof. Milanko Maksic, PhD, Full Professor; Prof. Novak Vasic, PhD, Full Professor; Prof. Slavko Manojlovic, PhD, Full Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	None

Goals of the Course Unit:

The course unit aims at introducing the students to pathogenetic and pathophysiological mechanisms of surgical diseases, to their respective clinical charts, to diagnostic procedures applied, and to contemporary therapeutic procedures.

Learning Outcomes (acquired knowledge):

The students will have been able to interpret the disease history and establish the diagnosis of a surgical disease and to apply the adequate treatment of the most common surgical dieseases. The students will have been able to independently examine a patient, to analyse the epidemiology and pathogenetic mechanisms, to recognise the clinical chart of the most common surgical diseases, to design a plan of diagnostic procedures necessary for the establishment of the diagnosis of a surgical disease, and to apply the adequate therapy. In addition, the students will have been able to recognise urgent conditions and treat them properly, to conduct post-surgical examinations and take basic care of a surgical patient, and to master the prognosis of the aforementioned diseases.

Contents of the Course Unit:

Fundamentals of surgery (asepsis, antisepsis, wounds, treatment of wounds, healing of wounds, surgical infections). Anaesthesiology and reanimation. Head and neck surgery with maxillofacial surgery. Breast surgery.Esophagus and diaphragm surgery. Endocrine glands surgery. Abdomen surgery. Thoracic surgery. Cardial surgery; Vascular and transplantation surgery; Plastic and reconstructive surgery; Neurosurgery; Urology, Orthopaedic surgery with traumatology; Wartime surgery

Teaching methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Максимовић и сарадници. Хирургија за студента медицине и лекаре. Београд: Медицински факултет; 2019.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**

Practical Mid-Term	**40**			
		Oral Exam	**50**	
Note for the Course Unit:				
Syllabus Designer: Prof. Milan Simatovic, PhD, Full Professor				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course Unit Name	**Paediatrics**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Name Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	COMPULSORY	IX and X	IX: 3L +3P X: 3L +3P	12
Staff	Prof. J. Predojevic Samardzic, PhD, Full Professor; Prof. G. Bukara Radujkovic, PhD, Associate Professor; Prof. S. Petrovic Tepic, PhD, Associate Professor O. Ljuboja, MA, Senior Teaching Assistant; D. Malcic Zanic, MA, Senior Teaching Assistant; N. Maric, MA, Senior Teaching Assistant; Aleksandra Serdar, MA, Senior Teaching Assistant; LJ. Solomon, MA, Expert Associate; D. Jojic, MA, Expert Associate; S. Konjevic, PhD, Vesna Novakovic, PhD; B. Banjac, PhD; Elvira Simic, PhD; B. Suzic, PhD; S. Milanovic, PhD; Vanja Bobic, PhD; Ljubo Visekruna, PhD			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	According to the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at introducing the students to the current theoretical knowledge and practical skills from the area of children health spanning the period of birth until the end of adolescence (18 years of age). The students will have been primarily introduced to the physiology of growth of all organ systems within the period designated, with studying simultaneously the most common respective diseases and disorders of the aforementioned organ systems. The course unit puts special emphasis on prevention of diseases and disorders in children.

Learning Outcomes (acquired knowledge):

Upon the completion of the course unit, the students will have been able to independently:
- assess the normal growth and development of a child and identify the existence of a disorder and/or a deviation in psychomotor development and nutrition of a child
- conduct adequate prophylactic measures in a child (rickety and sideropenic anemia)
- assess the general condition of a child and identify the presence of a disease
- recognise emergency and vitally threatening conditions and diseases in childhood and implement adequate procedures of resuscitation and/or medical treatment
- plan diagnostic procedures according to the clinical chart
- implement adequate measures of treatment and care of a sick child

Contents of the Course Unit:

Normal growth and development of a child. Disorders of metabolism. Nutrition of a healthy and a sick child. Neonatology. Diseases of blood and blood-producing organs. Children's oncology. Respiratory tract diseases. Gastrointestinal tract diseases. Central and peripheral nervous system diseases. Skeletal and muscle systems diseases. Urogenital tract diseases. Cardiovascular system diseases. Endocrine diseases in children. Immunological and autoimmune diseases in children. Emergency conditions in paediatrics.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Мардешић Д. и сарадници: Педијатрија, Школска књига Загреб; 2016
Перишић В, Јанковић Б. : Педијатрија, Медицински факултет, Београд 2014.
Marcdante K, Kliegman R.: Nelson Essential of Pediatrics, 7 th Edition Elsevier, 2015.

Examination Forms:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Mid-term(s)	**40**	**Oral / Written**	**50**	
Seminar paper				
Note for the Course Unit:				
Syllabus designer: Prof. Jelica Predojevic Samardzic, PhD, Full Professor				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course Unit Name	**Gynecology and Obstetrics**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
	COMPULSORY	IX and X	IX: 2L +3P X: 2L +4P	11
Staff	Prof. Vesna Ecim-Zlojutro, PhD, Full Professor; Prof. Dragisa Draganovic, PhD, Full Professor; Prof. Branka Canncarevic Djajic, PhD, Full Professor; Miroslav Popovic, PhD, Assistant Professor; Zivorad Gajanin, PhD, Assistant Professor; Arnela Ceric Banicevic, PhD; Mile Bokan, MA; Vladimir Perendija, MA; Zora Antonic, MA; Slobodan Grahovac, PhD, Jovica Ivic, PhD; Zeljko Topic, PhD, Aleksandra Rodic, PhD			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	According to the Rules of Studying at I Cycle Academic Studies

Goals of the Course Units:

The course unit aims at introducing the students to the physiology of women, of pregnancy, and of delivery, to the pathophysiological mechanisms of the most common gynecological diseases and to their respective clinical charts, to diagnostic procedures applied, and to contemporary therapeutic procedures and prognosis. In addition, it aims at introducing the students to the fundamentals of obstetrics and diseases caused by pregnancy and during pregnancy.

Learning Outcomes (acquired knowledge):

The students will have been able to describe physiological characteristics of female sex, of pregnancy, and of delivery, to establish diagnosis and treat the most common gynecological diseases, to independently take the gynecological history, perform a gynecological examination, plan diagnostic procedures, and apply the adequate therapy. Furthermore, the students will have been able to describe a normal delivery and assess the most significant obstetric problems, to recognise emergency gynecological/obstetric conditions and treat them accordingly. Finally,the students will have been able to provide consultancy on family planning methods and on conjugal infertility treatment.

Contents of the Course Unit:

Physiology of female reproductive organs, reproductive maturity, and life periods of a woman; Disorders of ovary functions; PMS syndrome; Amemorrhea; Dysmenorrhea; Diagnostic procedures in gynecology; Abortion; Ectopic pregnancy and endometriosis; Infections and inflammations of genital tract; Acute abdomen in gynecology; Conjugal infertility, family planning, and contraception; Genetics in gynecology; Tumors of female reproductive organs; Breast diseases; Obstetrics; Fertilisation, pregnancy, and normal delivery; Normal puerperium and lactation; Basics of vital statistics in obstetrics; Diseases caused by pregnancy; Hematological and cardiovascular diseases in pregnancy; Infectious diseases and vaccination in pregnancy; Kidney diseases and urinal tract diseases in pregnancy; Diseases of a mother's endocrine systems and pregnancy; Rh and abo isoimmunisation; Surgical and neuropsychiatric diseases in pregnancy; Stillbirth and pathological puerperium; Obstetric anesthesiology and analgesia and obstetric surgeries; Obstetrics in emergency and wartime conditions and forensic medicine issues in obstetrics.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Плећаш Д, Станимировић Б, Станковић А, Васиљевић М. Гинекологија и Акушерство, Уџбеник за студенте медицине, Универзитет у Београду, Медицински факултет. Цибид 2011.
2. Петронијевић М. Практикум из породиљства. Универзитет у Београду, Медицински факултет, 2019.

Examination Forms:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Practical mid-terms	**40**	**Oral / Written**	**50**	
Seminar paper				
Note for the Course Unit:				
Syllabus designer: Prof. Branka Cancarevic-Djajic, PhD, Full Professor				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course Unit Name	**Social medicine**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	COMPULSORY	IX	1L + 1P	2
Staff				

Eligibility Requirements	**Form of Requirements**
None	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at enabling the students to participate in a unique process of healthcare and at making it possible for them to acquire certain theoretical knowledge, practical skills, and attitudes necessary for understanding the impact of various physical and social factors on health. The students will have learned how to assess the health condition of population, how to prioritise health issues, and how to plan, implement, and evaluate public health programmes. In addition, the students will have been introduced to the fundamentals of healthcare organisation and health economics, with emphasis on social and preventive components component of healthcare.

Learning Outcone (acquired knowledge):

Upon completion of the course unit, the students will have been able to:

1. recognise health needs and establish health priorities;
2. make ties between theoretical and practical knowledge upon promotion of health in community;
3. describe the influence of various factors on health
4. understand the fundamentals of healthcare organisation and health economics
5. understand the process of creation and implementation of public health policies, as well as the significance of their evaluation
6. assess the health condition of population
7. compare the health condition of the population of the Republic of Srpska with other countries

Contents of the Course Unit:

1. Definition and tasks of social medicine in the present and in the present. Challenges of contemporary age. Social medicine and public health.
2. Statistics, epidemiology, and scientific research in social medicine.
3. Universal healthcare coverage. Inequality in health.
4. Social medicine in the function of studying determinants of health and diseases
5. Social medicine in the function of measuring the health condition of population.
6. Medical documentation and records in the present and in the past. The role and place of information technologies in medicine
7. Social medicine in the function of health prpomotion and disease prevention.
8. Health promotion and disease prevention with regard to specific needs of various social groups.
9. Social medicine in the function of healthcare organisation and health economics.
10. Кризно комуницирање Social medicine in the function of setting priorities in a healthcare system. Healthcare organisation and setting priorities in crisis situations (emergencies).

11. The role of social medicine in creation, supervision, and evaluation of public health programmes.
12. Evidence-based public health programmes
13. Social medicine in the function of healthcare quality. Indicators of healthcare quality supervision. Healthcare quality superevision in the Republic of Srpska and possibility of international comparison.
14. Social medicine in the function of creation, implementation, and evaluation of health policies and health legislation. Health in all policies. Health legislation in the Republic of Srpska.
15. Social medicine in the function of global health supervision. International health cooperation. The role of international organisations in creation and implementation of health programmes.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Социјална медицина. Уџбеник за студенте медицине. Универзитет у Бањалуци, Медицински факултет, Бањалука 2022. *У припреми*
2. Социјална медицина. Уџбеник за студенте медицине. Снежана Симић и сар. Универзитет у Београду, Медицински факултет, ЦИБИД, Београд 2012.
3. Социјална медицина. Желимир Јакшић, Лука Ковачићи сур. Медицинска наклада Загреб, 2000.
4. Одабрани чланци из релевантне литературе доступни на PubMed и другим интернет изворима (WHO, CDC, ECDC, Министарство здравља и социјалне заштите Републике Српске...).

Examination Forms:

Pre-Exam Duties		Final Exam		Total Point
Attendance	**10**			**100**
Midterms		**Oral / Written**	**50**	
Seminar paper	**40**			

Note for the Course Unit:

Syllabus designer: Stela Stojisavljevic, PhD, Assistant Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course Unit Name	**Hygiene with medical ecology**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	COMPULSORY	IX	2L+1P	3
Staff	Vesna Rudic Grujic, PhD; Dragana Stojisavljevic, PhD; Milkica Grabez, MA; Ljiljana Stanivuk, MA			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

Introducing the students to the field of the environment and nutrition with a view to preserving and improving health.

Learning Outcomes (acquired knowledge):

The students will have been equipped with the knowledge to assess the impact of factors from the environment on the health of human population and take pre-emptive actions in the field of environment protection. In addition, the students will have been able to assess the impact of nutrition on human health and participate in prevention of mass non-infectious diseases.
Skills: Design and implementation of preventive programmes for preservation and improvement of the environment and human health. Assessment of nutrition in various age groups.

Contents of the Course Unit:

The course unit is based upon a multi-disciplinary approach and an analysis of factors from the environment that may have impact on human health. Air and climate as health factors. Electromagnetic radiation and its impact on human health. Noise in the environment and human health. Eco-toxicology and cancerous matters in the environment. Water and human health. Food – fundamentals of proper nutrition and dietotherapy. Nutrition of various population groups. Medical-ecological aspects of residing. Sanitary hygiene. Mental hygiene. Hygiene in emergency conditions.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Новаковић Б. (2014). Исхрана и здравље. Нови Сад: Медицински факултет
2.Јорга Ј. (2013). Хигијена. Београд: Медицински факултет Универзитет у Београду.
3. Васиљевић, Н. (2015). Практикум из хигијене са медицинском екологијом. Београд: Медицински факултет Универзитет у Београду.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Point**
Attendance	**10**			**100**
Midterms	**20**	**Oral exam**	**50**	
Practical exam	**20**			

Note for the Course Unit:

Syllabus designer: Vesna Rudic Gajic, PhD

	UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE			
	UNDERGRADUATE STUDIES			
	Study Programme of:	**MEDICINE**		
Course Unit Name	**Physical medicine and rehabilitation**			
Type of Course Unit	**Appled Professional**			
Courese Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	COMPULSORY	X	2L + 1P	3
Staff	Tatjana Nozica Radulovic, PhD, Assistant Professor; Tamara Popovic, PhD, Assistant Professor; Dragana Dragicevic Cvjetkovic, PhD, Assistant Professor; Dragana Bojinovic Rodic, PhD, Assistant Professor; Maja Vuckovic, PhD, TA; Sandra Trivunovic, PhD, TA; Drasko Prtina, Expert Associate; Teodora Talic, Expert Associate			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims to introduce the students to the following:

a) Major features and goals of the rehabilitation process and of the functional process in rehabilitation
b) Multi-system effects of inactivity and non-specific measures to prevent them
c) Thearapeutic methods of physical medicine and rehabilitation
d) Basic principles of rehabilitational and physical therapeutic methods in all fields of medicine, particularly in neurology, internal medicine, surgery, and paediatrics
e) Multi-disciplinary approach in medical treatment and rehabilitation

Learning Outcomes (acquired knowledge):

Upon the completion of the course unit, the students will have been able to;

a) Understand the basic principles of operation of major therapeutic methods, that is, the outreach of physical medicine and rehabilitation
b) Recognise, based on the level of damage caused by the principal disease or injury, the current or potential inability and disturbance of the body's functionality
c) Understand the connection between the functional status of a patient and basic principles of rehabilitation in various fields of internal medicine (cardiology, rheumatology, endocrinology), neurology, surgery, and paediatrics, as well as in specific populations of oncological and geriatric patients
d) Recognise the possibility of application of early and late rehabilitation measures in order to prevent complications and improve the functional status of a patient by involving a physical medicine and rehabilitation specialist on the team or by committing a patient to a secondary- or tertiary-level healthcare institution

Contents of the Course Unit:

Theoretical classes

Fundamentals of physical medicine and rehabilitation. Major features of rehabilitation process. Major components of rehabilitation. Significance and methods of functional assessment. Functional assessment of general and local mobility. Significance of electrodiagnostic methods in rehabilitation. Methods of physical medicine and rehabilitation. Fundamentals of operation and of clinical application of thermotherapy, hydrotherapy, kinesitherapy, mechanotherapy, electrotherapy, phototherapy, sonotherapy, magnetotherapy, balneo-climatological factors, and ortho-prosthetic devices. Early rehabilitation, significance of early rehabilitation in prevention of multi-system effects of inactivity.

Practicals
Clinical assessment of patients with various diseases and damages, interpretation of findings with regard to rehabilitational goals and fundamentals of application of physical medicine and rehabilitation. Review of therapeutic methods of physical medicine and rehabilitation featuring a selection of diseases and injuries.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Петронић Марковић И. и сар. Основи физикалне медицине и рехабилитације – уџбеник за студенте медицине. Медицински факултет Универзитета у Београду 2014.г., Катедра за физикалну медицину и рехабилитацију.

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**			**100**
Midterms	**20**	**Oral exam**	**50**	
Seminar paper	**20**			

Note for the Course Unit:

Syllabus designer: Tatjana Nozica Radulovic, PhD, Assistant Professor

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course Unit Name	**Clinical biochemistry**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	COMPULSORY	IX	1L + 1P	2
Staff	Prof. Nela Raseta Simovic, PhD, Full Professor; Mirna Popovic Saric, BSc, Expert Associate			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at 1. introducing the students to biochemical analyses used in contemporary laboratory diagnostics and enabling them to properly interpret the results of biochemical tests in accordance with human pathology and at 2. enabling them to recognise and identify certain laboratory findings by taking into consideration a patient's medical history and clinical chart.

Learning Outcomes (acquired knowledge):

The students will have been able to search for respective laboratory tests in accordance with a patient's medical history and clinical chart, to properly interpret the results gained, and to rationally choose diagnostic procedures.

Contents of the Course Unit:

Strategy of rational use of laboratory findings. Role and place of laboratory testing and dependence of clinical decision upon laboratory tests. Interpretation of laboratory findings. Biochemical analyses of blood proteins and their diagnostic significance. Biochemical parameters of inflammation. Laboratory diagnostics of lipoprotein disorders and assessment of cardiovascular risk. Biochemical diagnostics of myocardial ischemia and necrosis. Laboratory diagnostics of diabetes mellitus. Biochemical parameters used for testing the function of liver, kidneys, exocrine pancreas, and endocrine system. Tumor markers and biomarkers of bone metabolism disorders. Laboratory diagnostics of neurological diseases and urgent medical conditions. Clinical biochemistry in paediatrics and geriatrics. Laboratory monitoring of pregnancy. Impact of drugs on the results of the most common biochemical findings.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Чепелак И и сар. Медицинско – биохемијске смјернице, 2004. Медицинска наклада Загреб
Топић Е. и сар. Медицинско биохемијска дијагностика у клиничкој пракси, 2004. Медицинска наклада Загреб
Топић Е. и сар. Медицинска биокемија и лабораторијска медицина у клиничкој пракси, 2017. Медицинска наклада Загреб
Walker S, Beckett G, Rae P, Ashby P. Clinical Biochemistry. 9th ed. Wiley – Blackwell 2013.

Examination Forms:

Pre-Exam Duties	**Final Exam**	**Total Points**

Attendance	**10**	**Oral and written exams**	**50**	**100**
Midterms	**40**			
Note for the Course Unit:				
Syllabus designer: Prof. Nela Raseta Simovic, PhD, Full Professor				

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE	
UNDERGRADUATE STUDIES	
Study Programme of:	**MEDICINE**

Course Unit Name	**Acute and urgent conditions in gynecology, obstetrics, and perinatology**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	IX	1L + 1P	2
Staff	Prof. Vesna Ecim-Zlojutro, PhD, Full Professor; Prof. Dragica Draganovic, PhD, Full Professor; Prof. Branka Cancarevic Djajic, PhD, Full Professor; Miroslav Popovic, PhD, Assistant Professor; Zivorad Gajanin, PhD, Assistant Professor; Arnela Ceric Banicevic, PhD; Vladimir Perendija, MSc; Zora Antonic, PhD; Slobodan Grahovac, PhD; Jovica Ivic, PhD; Zeljko Topic, PhD; Aleksandra Rodic, PhD			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at introducing the students to pathogenetic and pathophysiological mechanisms of the most common urgent conditions in gynecology, obstetrics, and perinatology and to their respective clinical charts, to diagnostic procedures applied in the aforementioned areas, and to contemporary therapy protocols and prognosis. In addition, the course unit aims at introducing students to fundamentals of obstetrics and diseases caused by pregnancy and during pregnancy.

Learning Outcomes (acquired knowledge):

The students will have been able to describe physiological characteristics of female sex, of pregnancy, and of delivery, to establish a diagnosis, and to treat the most common gynecological diseases in everyday practice. Furthermore, the students will have been able to independently take a gynecological history and perform a gynecological examination, to design a plan of gynecological tests necessary for the establishment of a diagnosis, and to administrate a proper therapy. In addition, the students will have been able to describe a normal delivery and assess the most important obstetric problems and to recognise urgent gynecological/obstetric conditions and treat them accordingly. In the end, the students will have been able to consult couples on the methods of family planning and conjugal infertility.

Contents of the CourseUnit:

Injuries to genital organs. Acute and urgent conditions in peri- and post-menopause. Acute and urgent conditions in fertile age. Inflammatory diseases in pelvis. Pelvic pain. Hypertension in pregnancy. Diabetes mellitus and pregnancy. Surgical diseases in pregnancy. Immunological diseases in pregnancy. Pathological delivery. Acute and urgent conditions in postpartum period – puerperium. Shock. Hemorrhage in pregnancy. Preterm and post-term delivery. Twin delivery.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Плећаш Д, Станимировић Б, Станковић А, Васиљевић М. Гинекологија и Акушерство, Уџбеник за студенте медицине, Универзитет у Београду, Медицински факултет. Цибид 2011.
2. Петронијевић М. Практикум из породиљства. Универзитет у Београду, Медицински факултет, 2019.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Practical mid-terms	**2x20**	**Oral / Written**	**50**	

Note for the Course Unit:

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course Unit Name	**Clinical Toxicology**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	IX	1L+1P	2
Staff	Prof. Milos Stojiljkovic, PhD, Full Professor; Prof. Velibor Vasovic, PhD, Full Professor; Zana Maksimovic, BSc, Expert Associate			

Eligibility Requirements	**Form of Requirements**
Course Units of Pharmacology and Internal Medicine having been passed.	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

Acquisition of current theoretical knowledge about and practical skills in the field of clinical toxicology, about the mechanisms of toxic substances operation, about the points of entry of toxins into the organism, about etiopathogenesis, about symptomatology, and about treatment of the most significant medicamentous and non-medicamentous instances of poisoning. In addition, the students should acquire the skills necessary to providing first aid to and to perfoming a medical examination of a poisoned patient, to establishing a diagnosis, and to treating a patient prior to their admittance to a hospital and in hospital. It is necessary that students master the measures to prevent the poison to enter the organism by applying non-specific detoxicating methods and by specific antidote therapy, as well as by symptomatic therapy in treating poisoned patients.

Learning Outcomes (acqired knowledge):

Cognitive domain - knowledge

1. Explain the notions of poison and poisoning, the types of poison and poisoning, and the point of entry into the organism. 2. List and describe general principles of acute poisoning treatment. 3. List and describe measures aimed at preventing the poison entering the organism. 4. List and describe measures aimed at reducing the concentration of poison in the organism. 5. Explain the operation mechanism of poisonous gases, of alcohol, of caustic substances, and of heavy metals in the organism, and explain the respective clinical chart, diagnosis, and treatment of a patient. 6. List and explain toxic effects of certain drug groups – operation mechanism, diagnostics, clinical chart, complications, specific and non-specific therapy, and supportive measures. 7. List and explain the clinical presentation of mushroom toxicity and differences and the significance of recognition and adequate treatment of patients poisoned by mushrooms. List the most significant industrial poisons, household poisons, herbal and animal poisons, operation mechanism, and clinical presentation and treatment.

Psycho-motoric domain – skills:

1. Master the skills of providing first aid to a poisoned patient. 2. Master the skills of cardiopulmonary resuscitation of a poisoned patient. 3. Master the skills of non-specific detoxicating therapy. 4. Master the skills of specific treatment with regard to certain poisons

Contents of the Course Unit:

General toxicology: notion of poison, points of entry of poison into the organism, recognition of poisoning, general principles of acute poisoning treatment, therapeutic measures for preventing the poison entering the organism, therapeutic measures for reduction of poison concentration in the organism. **Special toxicology**: toxicokinetics and toxicodynamics of certain poisons, clinical chart, diagnostics, and treatment of certain poisonings.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Основна литература

1. Bev-Lorraine T, Dreisbach EH. Тровања: приручник – превенција, дијагноза и лечење.Према 13. издању / уредници 3. српског издања Богдан Бошковић, Вељко Тодоровић. Београд: Data Status; 2005.
2. Васовић В, Миков М, Ђаковић-Швајцер К. Одабрана поглавља из токсикологије. 2. допуњено издање. Кула: Борац;2009.

Допунска литература

3. Olson KR et al. Poisoning and drug overdose. Seventh edition. United States of America: McGraw-Hill; 2018.

Pre-Exam Duties		Final Exam		Total Points
Attendance	**10**	**Oral / Written**	**50**	**100**
Seminar Paper	**40**			

Note for the Course Unit:

Syllabus Designer: Prof. Milos Stojiljkovic, PhD, Full Professor

UNIVERSITY OF BANJA LUKA FACULTY OF MEDICINE				
UNDERGRADUATE STUDIES				
Study Programme of:	**MEDICINE**			
Course Unit Name	**Mechanical ventilation**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	IX	1L + 1P	2
Staff:	Prof. Pedja Kovacevic, PhD, Full Professor; Sasa Dragic, PhD, Assistant Professor; Danica Momcicevic, PhD, Assistant Professor			

Eligibility Requirements:	**Form of Requirements:**
Course units of Neurology, Infectious Diseases, and Internal Medicine having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at introducing the students to the fundamentals of mechanical ventilation, both invasive and non-invasive. In addition, the students are to be introduced to the interactions of mechanical ventilation and the respiratory system, as well as other organ systems.

Learning Outcomes (acquired knowledge):

The students will have been able to understand the fundamentals of mechanical ventilation and to implement it in critically ill patients.

Contents of the Course Unit:

Anatomy and physiology of breathing, respiratory insufficiency, oxygen therapy, maintaining respiratoy tract unobstructed, non-invasive mechanical ventilation, invasive mechanical ventilation, basic modes of mechanical ventilation, effects of mechanical ventilation on respiratory tract, positive end-expiratory pressure, systemic effects of mechanical ventilation, disconnection from mechanical ventilation, fundamentals of extracorporeal membrane oxygenation

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Основи интензивне медицине, Пеђа Ковачевић и група аутора, Главни и одговорни уредник: Пеђа Ковачевић, Медицински факултет Бања Лука, Бања Лука, 2022

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Practical Midterm	**40**	**Oral**	**50**	

Note for the Course Unit:

Syllabus Designer: Prof. Pedja Kovacevic, PhD, Full Professor

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICINE**

Course Unit Name	**Transportation of critically ill patient**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
	ELECTIVE	IX	1L + 1P	2
Staff	Prof. Pedja Kovacevic, PhD, Full Professor; Sasa Dragic, PhD, Assistant Professor; Danica Momcicevic, PhD, Assistant Professor			

Eligibility Requirements	**Form of Requirements**
Course units of Neurology, Infectious Diseases, and Internal Medicine having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at introducing the students with the protocols of intra- and inter-hospital transportation of critically ill patients, which implies making plans for the necessary equipment and drugs, assembling the respective medical documentation, administration of pre-medication, supervision during transportation and application of possible therapy, as well as making reports on the transportation itself and its outcome.

Learning Outcomes (acquired knowledge):

The students will have been able to plan all forms of intra- and inter-hospital transportation, to assess the technical minimum of the equipment, material, and drugs necessary for the transportation in question, to properly supervise vital functions, and to administer adequate therapy during the transportation, in accordance with the condition of the patient.

Contents of the Course Unit:

Fundamentals of the medical transportation of the critically ill. Types of medical transportation. Assessment of transportability of a critically ill patient. Transportation team. Transportation equipment and drugs. Preparation of the patient for transportation. Hygienic-epidemiological measures during transportation. Transportation techniques. Positions of the patient during transportation. Supervision during transportation. Medical interventions during transportation. Transportation as regards various conditions. Complications and lethal outcome during transportation. Legal responsibility in medical transportation.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Основи интензивне медицине, Пеђа Ковачевић и група аутора, Главни и одговорни уредник: Пеђа Ковачевић, Медицински факултет Бања Лука, Бања Лука, 2022

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Practical Midterm	**40**	**Oral**	**50**	

Note for the Course Unit:

Syllabus Designer: Prof. Pedja Kovacevic, PhD, Full Professor

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**	
	UNDERGRADUATE STUDIES	
	Study Programme of:	**MEDICNE**

Course Unit Name	**Nutrition and health**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	X	1L+1P	2
Staff	Vesna Rudic Grujic, PhD; Dragana Stojisavljevic, PhD; Milkica Grabez, MSc, Ljiljana Stanivuk, MSc.			

Eligibility Requirements	**Form of Requirements**
	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

This course unit aims to introduce the students to the significance of optimal nutrition for preservation and improvement of health. In addition, it enables the students to acquire knowledge about specific dietary needs and about designing a diet in accordance with certain pathological condition. Finally, the students will have been able to master methods for assessment of nutrition and develop a critical view of the relationship between nutrition and health.

Learning Outcomes (acquired knowledge):

The students will have been able to define basic principles of optimal nutrition, to describe principle of proper nutrition, to explain the influence of nutrition on health, to discuss about significant the macronutrient-micronutrient ratio is, to differentiate between preventive and clinical approach to proper nutrition, to assess the level of nourishment, and to suggest and implement the medical nutrition planning and medical nutrition therapy processes as regards a certain disease.

Contents of the Course Unit:

The course unit is based upon a multi-disciplinary approach and a problem analysis that refer to the impact of nutritivefactors on human health. Structure of ingredients and diet plan. Introduction to clinical nutrition with fundamentals of medical nutritive therapy. Dietotherapy of acute and chronic conditions.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

1. Новаковић Б. (2014). Исхрана и здравље. Нови Сад: Медицински факултет
2.Jорга Ј. (2013). Хигијена. Београд: Медицински факултет.
3. Васиљевић, Н. (2015). Практикум из хигијене са медицинском екологијом. Београд: Медицински факултет.
4. Escott- Stump S. (2015). Nutrition and diagnosis- related care 10th ED. Lippincot Williams & Wilkins

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**

Midterms	**20**	**Oral**	**50**	
Practical exam	**20**			
Note for the Course Unit:				
Syllabus Designer: Vesna Rudic Grujic, PhD				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	UNDERGRADUATE STUDIES			
	Study Programme of:	**MEDICINE**		
Course Unit Name	**Rare diseases in children**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Course**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	X	1L +1P	2
Staff	Prof. Jelica Predojevic Samardzic, PhD, Full Professor; Prof. G. Bukara Radujkovic, PhD, Full Professor; Nina Maric, MSc, Senior Teaching Assisstant; Olivera Ljuboja, MSc, Senior Teaching Assistant; Dragana Malcic Zanic, MSc, Senior Teaching Assistant			

Eligibility Requirements	**Облик условљености**
All course units from the previous academic year having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims to introduce the students to rare diseases in paediatrics, to the basic characteristics of their respective clinical charts, and to possibilities of their treatment.

Learning Outcomes (acquired knowledge):

The students will have been able to:

- describe and assess the clinical chart of an ill child that may correspond to the clinical chart of a rare disease
- plan basic diagnostic tests that refer to a rare disease
- apply symptomatic therapy in accordance with clinical chart
- prepare the patient for further testing in a referent institution of higher rank
- supervise the condition of the patient and detect changes to the clinical chart

Contents of the Course Unit:

Basic characteristics of rare diseases. Basic metabolic screening. Cystic fibrosis. Hemophilia. Mucopolysaccharidosis. Glycogenosis. Rare genetic disorders.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Мардешић Д. и сарадници: Педијатрија, Школска књига Загреб; 2016
Перишић В, Јанковић Б. : Педијатрија, Медицински факултет, Београд 2014.
Marcdante K, Kliegman R.: Nelson Essential of Pediatrics, 7 th Edition Elsevier, 2015.
Предојевић Ј, Марић Н. Ријетке болести у педијатрији, 2012.

Examination Forms:

Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**

Midterms	**40**	**Oral / Written**	**50**	
Seminar Paper				
Note for the Course Unit:				
Syllabus Designer: Prof. Jelica Predojevic Samardzic, PhD, Full Professor				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	ДОДИПЛОМСКИ СТУДИЈ			
	Study Programme of:	**MEDICINE**		
Course Unit Name	**Traumatic injury in surgery**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	X	1L + 1P	2
Staff	Prof. Milan Simatovic, PhD, Full Professor; Prof. Dusko Vasic, PhD, Full Professor; Prof. Darko Lukic, PhD, Full Professor; Prof. Mirko Rakovic, PhD, Full Professor; Prof. Dragan Kostic, PhD, Full Professor; Prof. Snjezana Milicevic, PhD, Full Professor; Prof. bozo Krivokuca, PhD, Full Profesosor; Prof. Jovan Culum, PhD, Full Professor; Prof. Sinisa Maksimovic, PhD, Full Professor; Prof. Darko Golic, PhD, Full Professor; Prof. Darko Jovic, PhD, Full Professor; Prof. Vesna Ivanisevic, PhD, Full Professor; Prof. Goran Talic, PhD, Full Professor; Prof. Zoran Aleksic, PhD, Full Professor; Prof. Milanko Maksic, PhD, Full Professor; Prof. Novak Vasic, PhD, Full Professor; Prof. Slavko Manojlovic, PhD, Full Professor			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	

Goals of the Course Unit:

The course unit aims at introducing the students to the mechanisms of traumatic injuries that demand a surgical treatment, to their respective clinical charts, to respective diagnostic procedures applied, as well as to contemporary methods of treatment, contemporary therapy, post-surgery supervision, and prognosis.

Learning Outcomes (acquired knowledge):

The students will have been able to interpret the history of illness and establish the diagnosis of a surgically treated injury, to implement the appropriate treatment of the most common surgical injuries in everyday practice within the primary healthcare system.

Contents of the Course Unit:

Injries that demand a surgical treatment. Initial medical treatment of the injured in hospital. Cardiopulmonary and cerebral resuscitation. Shock and blood transfusion. Initial treatment of patients in the state of shock. Wounds and healing of wounds. Metabolical response to a traumatic injury and principles of balnce between electrolytes and fluids. Bleeding and hemostasis. Thermic, chemical, and radiation injuries. Craniocerebral injuries, brain edema, and intracranial bleeding.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Максимовић и сарадници. Хирургија за студента медицине и лекаре. Београд: Медицински факултет; 2019.

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	10			100
Practical Midterm	40	Oral	50	
Note for the Course Unit:				
Syllabus Designer: Prof. milan Simatovic, PhD, Full Professor				

	UNIVERSITY OF BANJA LUKA **FACULTY OF MEDICINE**			
	UNDERGRADUATE STUDIES			
	Study Programme of:	**MEDICINE**		
Course Unit Name	**Minimal invasive surgery**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
TO BE DESIGNATED	ELECTIVE	X	1L + 1P	2
Staff	Prof. Milan Simatovic, PhD, Full Professor; Prof. Dusko Vasic, PhD, Full Professor; Prof. Darko Lukic, PhD, Full Professor; Prof. Mirko Rakovic, PhD, Full Professor; Prof. Dragan Kostic, PhD, Full Professor; Prof. Snjezana Milicevic, PhD, Full Professor; Prof. bozo Krivokuca, PhD, Full Profesosor; Prof. Jovan Culum, PhD, Full Professor; Prof. Sinisa Maksimovic, PhD, Full Professor; Prof. Darko Golic, PhD, Full Professor; Prof. Darko Jovic, PhD, Full Professor; Prof. Vesna Ivanisevic, PhD, Full Professor; Prof. Goran Talic, PhD, Full Professor; Prof. Zoran Aleksic, PhD, Full Professor; Prof. Milanko Maksic, PhD, Full Professor; Prof. Novak Vasic, PhD, Full Professor; Prof. Slavko Manojlovic, PhD, Full Professor			
Eligibility Requirements				**Form of Requierements**
All course units from the previous academic year having been passed				

Goals of the Course Unit:

The course unit aims at introducing the students to indications of, to contraindications of, to performance techniques in, to complications of, and to post-operative care in minimal invasive surgery.

Learning Outcomes (стечена знања):

The students will have been able to interpret the history of illness and establish the diagnosis of a condition that requires a minimal invasive surgery treatment and to assist in treating the most common surgical conditions applying the aforementioned technique.

Contents of the Course Unit:

Place and role of minimal invasive surgery in medicine, its development, basic diagnostic modalities, and surgical techniques. Contemporary technological methods of sterilisation in minimal invasive surgery. Post-operative care of wound in minimal invasive surgery. Injuries of esophagus and diaphragm within traumatic injuries of thorax and abdomen. Surgical treatment of stomach and duodenum injuries. Surgery of small intestine and appendix. Surgery of anorectum. Acute abdomen syndrome, peritonitis. Injuries of abdomen. Intestinal obstruction syndrome. Classification of vascular diseases. Injuries of blood vessels. Acute and chronic diseases of veins. Principles of fracture treatment. Injuries of hand. Injuries of spine. Bone-joint infection. Diseases of prostate. Scalds. Breast cancer.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Максимовић и сарадници. Хирургија за студента медицине и лекаре. Београд: Медицински факултет; 2019.

Examination Forms:				
Pre-Exam Duties		**Final Exam**		**Total Points**
Attendance	**10**			**100**
Practical Midterm	**40**	**Oral**	**50**	

Note for the Course Unit:

Syllabus Designer: Prof. Milan Simatovic, PhD, Full Professor

UNIVERSITY OF BANJA LUKA
FACULTY OF MEDICINE

UNDERGRADUATE STUDIES

Study Programme of: **MEDICINE**

Course Unit Name	**Maxillofacial surgery**			
Type of Course Unit	**Applied Professional**			
Course Unit Code	**Course Unit Status**	**Semester**	**Class Workload**	**Number of ECTS Credits**
	ELECTIVE	X	1П + 1В	2
Staff	Проф. др Ружица Козомара, Др Дејан Ђурђевић, Др Маринко Каралић, Панџић Драган, Др Марио Миздарић Prof. Ruzica Kozomara, PhD, Full Professor; Dejan Djurdjevic, PhD; Marinko Karalic, PhD, Dragan Pandzic, PhD; Mario Mizdaric, PhD			

Eligibility Requirements	**Form of Requirements**
All course units from the previous academic year having been passed	In accordance with the Rules of Studying at I Cycle Academic Studies

Goals of the Course Unit:

The course unit aims at introducing the students to basic areas of maxillofacial surgery and to enabling them to establish a working or final diagnosis of a maxillofacial region diseases and to treat a patient with maxillofacial pathology.

Learning Outcomes (acquired knowledge):

The students will have been able to interpret the history of illness, to establish the diagnosis of a surgical disease from the area of maxillofacial surgery, and to treat the most common diseases in this area. In addition, the students will have been able to take the history of illness and perform the examination of a patient, to analyse epidemiology and pathogenetic mechanisms, as well as recognise the respective clinical charts of the most common maxillofacial surgical diseases.

Contents of the Course Unit:

Diagnostics and principles of broken jaw and of facial bones fractures treatment. Diagnostics and principles of treatment of phlegmonous inflammation of face and neck. Salivary gland diseases. Congenital, developing, and acquired deformities of face and jaws. Sialodenitis, sialolithiasis. Benign and malignant tumors of salivary glands. Malignant tumors of oral cavity mucous membrane. Sarcoma of maxillofacial region. Odontogenic tumors. Oncological principles of surgical treatment of maxillofacial region tumors. Contemporary diagnostics and principles of treatment of vascular malformations of head and neck. Orofacial pain.

Teaching Methods:

The classes are given in the form of lectures and practical classes, with continuous revision through practicals, seminars, midterms, office hours, and independent students' work.

Literature:

Красић Д. Максилофацијална хирургија. Медицински факултет Ниш, Ниш, 2013.
Димитријевић М. Максилофацијална хирургија. Универзитет у Београду, Медицински факултет, Београд, 2020.

Examination Forms:

Pre-Exam Duties		Final Exam		Total Points
Attendance	**15**			**100**
Midterms	**5**	**Oral / Written**	**50**	
Practicals	**30**			

Note for the Course Unit:

Syllabus Designer: Prof. Ruzica Kozomara, PhD, Full Profesosr