

MFSE FIRST YEAR

FIRST YEAR

FIRST SEMESTER (WINTER)						
Code	Course Title	L	P	S	TCH	ECTS
MFSE 0101	Human Anatomy 1	60	60		120	10
MFSE 0102	Cell Biology and Human Genetics	45	45		90	7
MFSE 0103	Medical Ethics and Sociology	15	15	5	35	2
MFSE 0104	First Aid	5	15		20	2
MFSE 0105	Introduction to Medicine and History of Medicine	10	10	10	30	2
MFSE 0106	Medical Physics and Biophysics	28	22		50	4
MFSE 0107	Bosnian Language 1	15	15		30	2
MFSE 0108-0111	Elective Course	10	10		20	1
	TOTAL	188	192	15	395	30

Elective Courses:

MFSE 0108 **Anatomically -Anthropological significance of the skull**

MFSE 0109 Applied Anatomy of Pelvis

MFSE 0110 The Basics of Population Genetics in Medicine

MFSE 0111 Applied Anatomy of the Cardiovascular System

Code: MFSE 0101	Course title: Human Anatomy 1		
Level: preclinical	Study year: I	Semester: I	ECTS: 10
Status: obligatory	Total contact hours: 120		
Prerequisites:	According to the Study Regulation		
Lecturers: Prof. dr Aida Hasanović, Assos. Prof. dr Eldan Kapur, Assos. Prof. dr Aida Sarač-Hadžihalilović, Assos. Prof. dr Ilvana Hasanbegović, Assos. Prof. dr Alma Voljevica, Assos. Prof. dr. Almira Lujinović, Assis. Prof. dr Elvira Talović, Ass. dr Lejla Dervišević, Ass. dr Zurifa Ajanović			
1. Overall aim	Anatomy studies the normal structure of the human body. The goal is through the classes of Human Anatomy 1 to study Systemic anatomy, macroscopic characteristics of the organs, their blood supply, lymphatic drainage and innervation. In the systematic approach organs are grouped according to common function. Special emphasis in teaching is given to the general anatomical principles important for understanding the structure and function of the human body. The purpose of the course is to teach students with the morpho-functional organization of the system of organs of the human body, the clinical importance of certain organs morphology and managing in spatial orientation within the body, which is a necessary precondition for the further upgrading and acquisition of knowledge and skills of Human anatomy II and clinical medicine.		
2. Course contents	The following topics will be covered during the Modules: Module 1. Locomotor system Module 2. Cardiovascular and respiratory system Module 3. Digestive system, urogenital system, endocrine system and skin		
3. Learning outcomes (Knowledge, skills and competences)	Through the teaching of Human anatomy 1 student will acquire the following knowledge: 1. Students should be acquainted with anatomical nomenclature and Latin terminology, morphology of bones of the head, trunk and extremities, the skeleton as a whole, as well as with joint system as a whole. 2. Students should be acquainted with principles of the morphological structure of the cardiovascular and respiratory systems, vascularization, lymphatic drainage and innervation of the mentioned parts, as well as holotopic, sintopic and sceletotopic relations thereof. 3. Students should be acquainted with principles of the morphological structure of the digestive, urogenital, endocrine system and skin, vascularization, lymphatic drainage and innervation of the mentioned parts, as well as skeletotopic, sintopic and holotopic relations thereof. Through the course of Human anatomy 1 student will acquire the following skills: <i>- The skills that a student needs to know possession after the course:</i>		

	<ol style="list-style-type: none"> 1. Understand the anatomical nomenclature of the Latin terminology 2. Orientation of the long bones with special reference to the knowledge of the articular surfaces 3. Mechanics of movement in the joints individually, connections between the joint bodies. 4. Differences between the arterial, venous and lymphatic systems. 5. Recognizing the macroscopic structure of the heart, the respiratory, digestive, urogenital, endocrine system and skin 6. Identification of vascularization, innervation and lymphatic drainage organs of the cardiovascular, respiratory, digestive, urogenital and endocrine systems <p>- <i>The skills that a student needs to know to perform practically after the course</i></p> <ol style="list-style-type: none"> 1. Recognition of each organ 2. Set the organ in the correct position and recognize its sintopic relations on anatomical models <p>After attended courses of Human anatomy 1, student should adopt the following:</p> <ol style="list-style-type: none"> 1. Observe human body as morpho-functional unit through knowledge of certain anatomical structures in terms of systematic anatomy. 2. Know that without the acquired knowledge of Anatomy 1 student will not be able to learn and understand the complex topographical relationships within the human body as a necessary prerequisite to the further education mastered the knowledge and skills in clinical medicine.
4. Teaching methods	<p>Classes are held in the form of:</p> <ul style="list-style-type: none"> -Lectures (60 hours) -Practical work (60 hours)
5. Method of knowledge assessment and examination	<ul style="list-style-type: none"> - Written tests in the form of- Multiple choice questions (MSQ tests) - Oral examination - Continuous knowledge and skills assessment will be carried out through Partial exams
6. Literature	<p>Recommended</p> <ul style="list-style-type: none"> – Drake RL, Vogl W, Mitchell AWM. Gray's Anatomy for Students. Elsevier Churchill Livingstone. 2005. – J. Waschke, F. Paulsen Sobotta Atlas of Human Anatomy, 15th Edition. Elsevier 2012
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN: HUMAN ANATOMY 1

Day	Teaching methods and materials	Number of hours
Day 1.	<p>Lecture: Introduction to the Anatomy. Historical development. The division of anatomy. Anatomical position and orientational plane. Anatomical terminology. Division of systematic anatomy. General osteology (development, structure and types of bones). General syndesmology (a division of joints between bones, classification and characteristics of immovable joints, movable joints, elements of joints, a division of the joints). Vertebral column (general characteristics).</p> <p>Practical work: The vertebrae. General, special and individual characteristics of the cervical, thoracic and lumbar vertebrae. Sacrum. Coccyx.</p>	<p>3</p> <p>3</p>
Day 2.	<p>Lecture: Clinical anatomy of vertebral column. Overview of the skeleton and joints of thorax, shoulder and upper arm. The centers of ossification. Mechanics of the shoulder and thoracic joints. Mechanics of breathing.</p> <p>Practical work: Syndesmoses and synchondroses of vertebral column, vertebral joints. Overview and orientation of the thoracic skeleton, shoulder and upper arm skeleton (sternum, ribs, clavicle, scapula and humerus). Analysis of compounds of the thorax and shoulder belt (thoracic joints, joints of pectoral girdle, shoulder joint).</p>	<p>3</p> <p>3</p>
Day 3.	<p>Lecture: Overview of the skeleton and joints of forearm and hand. The centers of ossification. Mechanics of the elbow joint and joints of forearm. Mechanics of the joints of hand. Coxal bone. Pelvis.</p> <p>Practical work: Overview and orientation of the forearm and hand skeleton (radius, ulna and bones of hand). Analysis of the forearm and hand joints (radio-ulnar syndesmosis, elbow joint, distal radioulnar joint, joints of hand). Overview and orientation of the skeleton of the pelvis (coxal bone, pelvis).</p>	<p>3</p> <p>3</p>
Day 4.	<p>Lecture: Mechanics of the pelvis. Applied anatomy and sexual dimorphism of the pelvis. Overview of the skeleton and joints of the thigh and lower leg. The clinical significance of knee joint. Mechanics of movement of the joints of the lower extremities.</p> <p>Practical work: Analysis of the joints of pelvis (joints of pelvic girdle, hip joint). Overview and orientation of the skeleton of the upper and lower leg (femur, patella, tibia and fibula). Analysis of thigh and lower leg joints (knee joint, tibio-fibular joint, tibio-fibular syndesmosis).</p>	<p>3</p> <p>3</p>
Day 5.	<p>Lecture: Overview of skeleton and joints of the foot. Mechanics of the</p>	<p>3</p>

	<p>movement of the upper and lower ankle joint. Static function of the foot. Cranium.</p> <p>Practical work: Overview and orientation of foot skeleton (bones of foot). Analysis of foot joint. Frontale bone.</p>	3
Day 6.	<p>Lecture: Neurocranium-examination and basic characteristics. Sphenoidal bone. Mechanics of the skull base.</p> <p>Practical work: Parietal bone. Occipital bone. Sphenoidal bone. Temporal bone.</p>	3 3
Day 7.	<p>Lecture: Temporal bone, mastoid antrum, canals of the temporal bone. The calvaria and cranial base, openings of the cranial base and their anatomical significance, fontanelles.</p> <p>Practical work: Temporal bone. Ethmoidal bone.</p>	3 3
Day 8.	<p>Lecture: Clinical anatomy of the skull. Viscerocranium, overview and basic characteristics.</p> <p>Practical work: Inferior nasal concha, maxilla, zygomatic bone. Lacrimal bone, nasal bone, vomer, palatine bone, mandible, hyoid bone.</p>	3 3
Day 9.	<p>Lecture: Anatomical importance of communication between topographic area of the skull and cranio-facial cavity. Ossification of bones of the head and its forensic and anthropological significance. Mechanics of head and cervical vertebrae joints.</p> <p>Practical work: Orbita, nasal cavity, infratemporal and pterygopalatine fossa, anthropometric points. Syndesmosis and synchondrosis of the head bones, temporomandibular joint, atlantooccipital joint and atlantoaxial joint.</p>	3 3
Day 10.	<p>Lecture: General angiology. Fundamentals of the blood system, large and small circulation. The main blood vessels. Introduction to the lymphatic system.</p> <p>Practical work: External and internal nose, paranasal sinuses, larynx (vascularization, innervation and lymphatic drainage). Partial exam 1 (MCQ – test)</p>	3 3
Day 11.	<p>Lecture: The principles of organization of the lymphatic system. Principles of organization of the vegetative nervous system, sympathetic and parasympathetic, principles of innervation of internal organs. The upper part of the respiratory system-overview.</p> <p>Practical work: Mechanics of the larynx, phonation. Trachea and bronchi.</p>	2 2
Day 12.	<p>Lecture: Lungs-morphology, structure, relations, principles of functional</p>	

	<p>anatomy, arterial and venous vascularization. Lymphatic drainage and innervation. Pleura - general characteristics and classification.</p> <p>Practical work: Posting lungs in to the correct anatomical position and recognition of its relations on the anatomical models. Recognition of the basic morphological characteristics of the lungs.</p>	<p>2</p> <p>2</p>
Day 13.	<p>Lecture: Heart - general characteristics, location. External and internal morphology of the heart.</p> <p>Practical work: Posting heart in to the correct anatomical position and recognition of its relations on the anatomical models. Recognition of the basic morphological characteristics of the closed and open heart.</p>	<p>2</p> <p>2</p>
Day 14.	<p>Lecture: The fibrous skeleton of the heart. Conducting system of heart and myocardium. Pericardium.</p> <p>Practical work: Overview of vascularization, lymphatic drainage and innervation of the respiratory system and heart. Large blood vessels-aorta and its branches, superior and inferior vena cava.</p>	<p>2</p> <p>2</p>
Day 15.	<p>Lecture: The clinical significance of anatomical heart vascularization. Anatomical features of fetal circulation. The innervation and lymphatic drainage of the heart.</p> <p>Practical work: Partial exam 2 (MCQ – test)</p>	<p>2</p> <p>2</p>
Day 16.	<p>Lecture: Oral cavity, division, content, anatomical relations, vascularization, lymphatic drainage and innervation.</p> <p>Practical work: Lips, cheek, theeths, palatine tonsil, hard and soft palate, tongue, muscles and innervation, major and minor salivary glands.</p>	<p>2</p> <p>2</p>
Day 17.	<p>Lecture: Morphology of the oesophagus, stomach and intestine. Vascularization, lymphatic drainage and innervation.</p> <p>Practical work: Macroscopic characteristics of the pharynx and oesophagus and its relations.</p>	<p>2</p> <p>2</p>
Day 18.	<p>Lecture: Glands with external and internal secretion, liver, gallbladder, pancreas, spleen. Functional and nutritional vascularization of liver.</p> <p>Practical work: Posting stomach into to the correct anatomical position and recognition of its relations on the anatomical models. Recognition of basic morphological characteristics of stomach. Recognition of basic morphological differences between small and large intestine.</p>	<p>2</p> <p>2</p>
Day 19.	<p>Lecture: Peritoneum-basic characteristics. Development of mesentery and the</p>	<p>2</p>

	<p>consequences of attachment of the dorsal mesentery.</p> <p>Practical work: Posting liver in to the correct anatomical position and recognition of its relations on the anatomical models. Recognition of basic morphology characteristics of the liver. Gallbladder, excretory ducts of gallbladder, portal vein system, pancreas and its excretory ducts, spleen, vascularization, innervation and lymphatic drainage.</p>	2
Day 20.	<p>Lecture: Urinary system - overview, kidneys, external and internal morphology. Kidney envelopes. Vascularization and segmentation of the kidneys. Innervation and lymphatic drainage.</p> <p>Practical work: Posting kidney, ureter and urinary bladder into the correct anatomical position, and recognition of its relations on the anatomical models. Recognition of basic morphological characteristics on kidneys, ureter and urinary bladder.</p>	2 2
Day 21.	<p>Lecture: Excretory apparatus of the kidneys, ureters, urinary bladder, female urethra.</p> <p>Practical work: Radiological-anatomical correlation and overview of organs of urinary system with modern radiological-diagnostic methods.</p>	2 2
Day 22.	<p>Lecture: Female genitalia-overview, ovary, uterine tube, uterus, vagina, female external genitalia. Vascularization, innervation and lymphatic drainage. Ligaments of female genital organs.</p> <p>Practical work: Posting female internal genitalia in to the correct anatomical position, and recognition of its relations on the anatomical models. Recognition of basic morphological characteristics of female internal genitalia.</p>	2 2
Day 23.	<p>Lecture: Male genitalia- overview, testis and scrotum, epididymis, ductus deferens, vascularization, innervation and lymphatic drainage, spermatic cord. Testicular descent.</p> <p>Practical work: Recognition of basic morphological characteristics of male internal genitalia.</p>	2 2
Day 24.	<p>Lecture: Prostate, male urethra, penis. Endocrine glands.</p> <p>Practical work: Endocrine glands, applied anatomy.</p>	2 2
Day 25.	<p>Lecture: Clinical anatomy of the endocrine system. Skin and its derivatives.</p> <p>Practical work: Partial exam 3 (MCQ – test)</p>	2 2
Week 17-18	Final exam (regular term)	
Week 19-20	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MSFE 0102	Course title: CELL BIOLOGY AND HUMAN GENETICS		
Level: preclinical	Study year: I	Semester: I	ECTS: 7
Status: obligatory	Total contact hours: 90		
Prerequisites:	According to the Study Regulation		
Lecturer:	Jasmin Mušanović, MSc, PhD, Azra Metović MSc, PhD		
1. Overall aim	The purpose of the subject is to examine complex events in a human cell, or in the body as a whole, in order to adequately position the role of inheritance in controlling human health.		
2. Course contents	<p>The following topics will be covered during the Modules:</p> <p>Module 1: Biology of Cells / Cells The objective of the module is to give a general outline about cells: formation, structure and function of cells</p> <p>Module 2: Molecular genetics of the human genome The aim of the module is to introduce students with structure, molecular organization and function of genetic material (DNA, genome, genes, chromosomes)</p> <p>Module 3: Mechanisms of reproduction The aim of the module is to introduce students to the methods of reproduction of biological systems</p> <p>Module 4: Basics and principles of genetic information flow The aim of the module is to introduce students with basic genetic mechanisms - Central Dogma of Molecular Biology - CDMB</p> <p>Module 5: Cellular and molecular basis of inheritance The aim of the module is to familiarize student with the legality and the types of biological inheritance of normal and pathological traits</p> <p>Module 6: Mutagenesis, carcinogenesis, teratogenesis The aim of the module is to acquaint student with the causes, types and consequences of hereditary based disorders, reparation possibilities, and the genetic causes of cancerogenesis and teratogenesis</p> <p>Module 7: Introduction to Genetics and Biotechnology The aim of the module is to introduce student with the basic principles of recombinant DNA technology and the possibilities of applying the same into the medicine</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p><i>Through the lectures of Biology and Human Genetics students will gain following knowledge and competences:</i></p> <ul style="list-style-type: none"> - Types of cellular organs, function of cell organelles - Structure, molecular organization and function of genetic material (DNA, RNA, genome, genes, chromosomes) - Types of reproduction of biological systems - Basic genetic mechanisms - central dogma of molecular biology CDMB - Principle and types of biological inheritance 		

	<ul style="list-style-type: none"> - Understand mechanisms of mutation - Types and consequences of hereditary diseases, genetic and epigenetic factors of carcinogenesis and teratogenesis - Basic Principles of Recombinant DNA Technology and Its Applications in Medicine <p><i>Through the practical work students will acquire following skills:</i></p> <ul style="list-style-type: none"> - Microscopy - Native and permanent slides production - Recognition and differentiation of different phases of mitosis, meiosis and spermatogenesis - Interpretation of human karyotype - Proper reading and interpretation of the human karyogram (normal and pathological) - Explain mechanisms that can lead to a human hereditary disorders - Analysis and explanation of DNA profiles - Explain the basic techniques of molecular genetics in the diagnosis of hereditary diseases - Proper usage of ISCN (International System for Human Cytogenetic Nomenclature) - Ability to create and explain heredogram (pedigree)
4. Teaching methods	<p>Lectures 45 hours</p> <p>Practical work: 45 hours</p>
5. Method of knowledge assessment and examination	<p>There are two partial exams consisted</p> <p>Partial exam 1 consists of a theoretical and a practical part.</p> <p><u>On the first partial exam</u> a student can gain a maximum of 50 and a minimum of 27,5 points.</p> <p>On the first partial exam from the practical part, a student can gain a maximum of 20 and a minimum of 11 points.</p> <p>On the first theoretical part, a student can gain a maximum of 30 points and a minimum of 16, 5 points.</p> <p>Partial exam 2 consists of a practical and theoretical part.</p> <p><u>On the second partial exam</u>, a student can gain a maximum of 50 and a minimum of 27,5 points.</p> <p>On the second partial exam of the practical part, a student can gain a maximum of 20 and a minimum of 11 points.</p> <p>On the theoretical part, a student can gain a maximum of 30 points and a minimum of 16, 5 points.</p> <p>If the student did not meet the partial exam, he / she would take part in the final exam.</p> <p>Scoring (continuous assessment of knowledge) will be done by different methods of assessment (MCQ, essay, student activity, and if necessary oral examination but not mandatory).</p>

	Formation of cumulative assessment <table><tr><th>Rating</th><th>Number of points</th><th>Description Rating</th></tr><tr><td>10 (A)</td><td>95-100</td><td>remarkable success without mistakes or with minor errors</td></tr><tr><td>9 (B)</td><td>85-94</td><td>above average, with some mistakes</td></tr><tr><td>8 (C)</td><td>75-84</td><td>average, with subtle errors</td></tr><tr><td>7 (D)</td><td>65-74</td><td>generally good, but with significant shortcomings</td></tr><tr><td>6 (E)</td><td>55- 64</td><td>meets the minimum criteria</td></tr><tr><td>5 (F,FX)</td><td>< 55</td><td>does not meet the minimum criteria</td></tr></table>	Rating	Number of points	Description Rating	10 (A)	95-100	remarkable success without mistakes or with minor errors	9 (B)	85-94	above average, with some mistakes	8 (C)	75-84	average, with subtle errors	7 (D)	65-74	generally good, but with significant shortcomings	6 (E)	55- 64	meets the minimum criteria	5 (F,FX)	< 55	does not meet the minimum criteria
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6. Literature	Obligatory: <ul style="list-style-type: none">– Daniel HL, Maryellen R.Genetics: Analysis of Genes and Genomes. 8th Edition. USA. Jones & Bartlett Learning; 2012.– Bruce A, Alexander DJ, Julian L, David M, Martin R, Keith R, Peter Walter. Molecular Biology of THE CELL. 6th edition. USA.Garland Sciences; 2015. Recommended: <ul style="list-style-type: none">– Ricki L. Human Genetics- Concepts and Applications. 10th edition. USA. Mc Graw Hill; 2012.– HANDOUTS																					
7. Remarks	Student office hours are published in a separate schedule which can be found on the Department’s notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department’s secretary or via e-mail: anatomija@mf.unsa.ba																					

COURSE PLAN: CELL BIOLOGY AND HUMAN GENETICS

Weeks	Form of Instructions and materials	Number of classes
Week 1.	Lectures: Cell. Biology today, Molecular Biology of the cell. The evolution of prokaryotic and eukaryotic cells. Cells as an experimental model. General plan of the cell structure, the chemical structure of the cell. The role of enzymes as biological catalysts. Cell membrane: ultrastructure, universal organization (Singer-Nicolson membrane model) and functions. The cytoskeleton - microfilaments. Intermediate filaments, microtubules. The nucleus, transport into and out from the nucleus, nuclear envelope, chromatin, Nucleolus (structure and function). Endoplasmic reticulum, golgi apparatus, lysosomes, mitochondria, ribosomes. For all organelles: structure, function, effects due to disturbances of the same.	3
	Practice: Molecular model of DNA molecule. DNA fragments identification.	3
Week 2.	Lectures: The cellular and molecular basis of heredity. DNA as the hereditary material. Types of DNA sequences. The genetic code. Human chromosomes - morphological, chemical and molecular structure. Methods of analysis of chromosomes. Nomenclature of chromosomes. Human genome. Gene and genetic information: structure (introns, exons, promoter, terminator) and functions.	3
	Practice: The microscope and microscopic techniques. The Electron microscope - cell organelles presentations.	3
Week 3.	Lectures: Introduction to Molecular Biology: DNA replication (characteristics, enzymes, importance). The cell cycle: the cell cycle of eukaryotic cells, checkpoints, regulation of the cell cycle. The nucleus and nucleolus during mitosis, phases of mitosis.	3
	Practice: The cell division - mitosis (Slides-root meristem cells of <i>Allium cepa</i>). Preparing <i>Allium cepa</i> bulbs for mutagenesis.	3
Week 4.	Lectures: Meiosis, gametogenesis: Genetic significance of meiosis. Gametogenesis (spermatogenesis and oogenesis, sperm development, oocyte development, fertilization, embryo, fetus, birth defects). Genetic recombination: - Homologous: synapsis, chiasma, crossing-over	3

	<p>- Non-homologous (insertion sequences / transposons). Fertilization. Sex determination and differentiation in people (the role of sex chromosomes).</p> <p>Practice: Meiosis (permanent slides). Gametogenesis: Spermatogenesis (permanent slides- <i>Mus musculus</i> testicle), Oogenesis.</p>	2 2
Week 5.	<p>Lectures: Principles of Medical Genetics: The consequences of meiosis: origin and causes of non-disjunction of homologous chromosomes, chromosome sets in humans. Chromosome aberration: numerical and structural.</p> <p>Practice: Human karyotype (observing slides - metaphase chromosomes from human peripheral blood lymphocytes). Chromosomes mutation (making temporary slides - observing effects of mutagens in the root cells of <i>Allium cepa</i>)</p>	3 3
Week 6.	<p>Lectures: Impact of genetics to medicine: human karyotype and karyogram. The importance of genetically caused diseases in humans. Multifactorial disorders. Syndromes and pathological conditions as a result of chromosomal abnormalities (etiology, incidence, characteristics, consequences and risk of manifestation / repetition). Prenatal and pre-implantation diagnosis of hereditary diseases.</p> <p>Practice: Human normal and pathological karyogram. Drawing and pasting.</p>	3 1 3
Week 7.	<p>Mid-term exam 1 (Partial exam 1)</p> <p>Lecture: Biomarkers in human genetics, the use and importance.</p>	3 2
Week 8.	<p>Lectures: Biosynthesis of cell constituents. The synthesis and processing of RNA – transcription. Molecular basis and principles of the flow of genetic information. Transcription - RNA synthesis (from DNA to RNA):</p> <ul style="list-style-type: none"> - RNA polymerase enzyme (structure, types, functions) - stages in the process of transcription, - transcription of structural genes - (DNA → mRNA; cod → codon; characteristics), - structure of the mRNA in procariotes and eukaryotes, - processing of primary transcripts, pre- mRNK, - splicing and alternative redrawing. 	3 3

	<p>Practice: Occuring mechanism of numerical chromosome aberrations in humans.</p> <p>Primary nondisjunction of autosomes and sex chromosomes. Phenotypic characteristics of syndromes resulting from numerical and structural aberrations of autosomes (exposing students).</p>	
Week 9.	<p>Lectures: Synthesis and processing of proteins: Translation of the genetic information (from DNA to proteins), genetic code. Activation of the amino acid. Initiation, elongation and termination of translation.</p> <ul style="list-style-type: none"> - function of mRNA, tRNA, rRNA in the process of translation, - typical enzymes and protein factors. Regulation of protein synthesis in procariotes and eukaryotes. <p>Mitochondrial DNA and mitochondrial genome. Extranuclear inheritance of human diseases.</p> <p>Practice: Secondary and postzygotic nondisjunction. Phenotypic characteristics of syndromes resulting from numerical aberrations of sex chromosomes (exposing students).</p>	<p>3</p> <p>1</p> <p>3</p>
Week 10.	<p>Lectures: Mutations; Molecular biology in medicine and system of reparations. Biological variability.</p> <ul style="list-style-type: none"> - types of genetic mutations and consequences (examples), - mutagenic agents, <p>Mechanisms for reparation: pre-replicative and pos-treplicative reparations.</p> <p>Practice: DNA profile in medicine. The basic laws of inheritance. Mendelian inheritance. Diseases caused by changes in the genetic material of man (exposing students)</p>	<p>3</p> <p>3</p>
Week 11.	<p>Lectures: The principles of Medical genetics. Gregor Mendel and the laws of inheritance. Monohybrid inheritance. Basic principles, principles and types of biological inheritance.</p> <ul style="list-style-type: none"> - chromosome theory of inheritance (gene, loci, alleles, genotype, phenotype, genes distribution and traits, expressiveness and penetrability of genes), - interaction of allelic genes –monogenic inheritance (dominant, recessive, intermediate, pseudoautosomal, codominant - examples). <p>Epigenetics.</p> <p>Practice: Models of inheritance - studying family, inheritance of normal and pathological conditions in humans (autosomal, sex-related).</p>	<p>3</p> <p>3</p>
Week 12.	<p>Lectures: Models of inheritance. Interaction of non-allelic genes - polygenic inheritance (additive and</p>	<p>3</p>

	<p>complementary polygeny; epistasis).</p> <p>Sex – Chromosome inheritance.</p> <p>Mitochondrial inheritance.</p> <p>Free combination of genes, gene mapping.</p> <p>Practice: Multiple alleles and polygenic inheritance, linked inheritance.</p> <p>Twins-importance for research in human genetics.</p> <p>Analysis of cytogenetic findings in medicine. Explanation of ISCN</p>	3
Week 13.	<p>Lectures: Cancer</p> <p>Development genes and cancer. Positional effects and development genes.</p> <p>Tumor genetics: development and causes of occurrence. Proto-oncogenes, oncogenes, tumor suppressor genes. Tumors - cell cycle, apoptosis, the role of telomeres in tumors.</p> <p>Molecular Biology of the prevention and treatment of cancer.</p> <p>Gene therapy, and potential applications in human genetics.</p> <p>Practice: Sex chromosome chromatin. Genetic testing of monogenic disorders by methods of medical genetics from sample to findings (explanation of EF, PCR, RTPCR, DNA sequencing), (exposing students).</p>	3 1 3
Week 14.	<p>Lectures: DNA technology (genetic engineering) and its application.</p> <p>Principles of genetic engineering. The forms of cloning. Gene banks. Vectors. Ethical principles.</p> <p>Recombinant DNA technology. Advantages and disadvantages of the recombinant DNA technology.</p> <p>Practice: Genetics tasks. Creating a heredogram. Genealogy symbols and abbreviation.</p> <p>Observation of Barr bodies from buccal cells of smokers and nonsmokers (native preparations).</p>	2 1 3
Week 15.	Mid – term 2 (Partial exam 2)	3
Weeks 17-18.	Final exam (regular term)	
Weeks 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0103	Course title: Medical Ethics and Sociology		
Level: preclinical	Study year: I	Semester: I	ECTS: 2
Status: obligatory	Total contact hours: 35		
Prerequisites:	According to the Study Regulation		
Lecturers:			
1. Overall aim	The overall aim of Medical Ethics and Sociology Course is to increase understanding about basic principles of sociology and bioethics.		
2. Course contents	The following topics will be covered within the Modules: Module 1. Medicine and other sciences Module 2. Medicine and bioethics Module 3. Specific medical ethics Module 4. Medicine and sociology Module 5. Normality and deviation in society Module 6. Socialization of personality Module 7. Lifestyle and health Module 8. “Risk society”- an attack on biological and ecological balance Module 9. Health and society		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge needed for understanding the causes and consequences of the diseases from the sociological aspect. They will be introduced to ethics and sociology and they relation with medicine.</p> <p><i>Through lectures students will develop the following knowledge:</i></p> <ol style="list-style-type: none">1. Learn to choose the most appropriate way to collect relevant sociological and medical information about diseases and human health.2. Know how to apply the appropriate treatment and evaluation of data collected in the field of bioethics and medical sociology.3. Develop basic knowledge about using appropriate methodology in writing and public presentation of seminars and other professional papers in bioethics and medical sociology.4. Discover interdisciplinary approach to understanding the sick and the healthy condition.5. Adopt the basic principles of learning medical professional roles. <p><i>Through the practical work student will acquire the following skills:</i></p> <ul style="list-style-type: none">- Usage of biomedical principles- Positive attitude towards the most important international organizations, conventions and agreements on the protection of human health.- Critical attitude towards the disruption of biological and ecological		

	<p>balance and other alarming imbalances at the global level</p> <ul style="list-style-type: none"> - Promotion of the protection of health
4. Teaching methods	<p>Lectures: 15 hours</p> <p>Exercises: 15 hours</p> <p>Seminars: 5 hours</p>
5. Method of knowledge assessment and examination	<ul style="list-style-type: none"> - Written test in form of – Multiple choice question (MCQ) - Oral examination <p>Continuous knowledge and skills assessment will be carried through Partial exams.</p>
6. Literature	<p>Recommended:</p> <ul style="list-style-type: none"> – Giddens A. Sociology, Polity Press, Oxford, UK.: Chapter I, 1. Sociology: Problems and Perspectives, p. 7-25, Chapter II, 5. Conformity and Deviance, p. 117-155, Chapter V, 18. Population, Health and Ageing, p. 577-600. – Beck U. Risk Society: Towards a New Modernity, London: Sage Publication, 1992. – Zussman R. The Contribution of Sociology to Medical Ethics, The Hosting Centar Report, v. 30, I, 2000: 7-11. <p>Additional:</p> <ul style="list-style-type: none"> – Žiga J. Cloning controversies, BIMA journal, v. 4, n. 7-8/2006: 20-33, Sarajevo. – Mehić B. Human genetics and reproductive Tehnologies, inetrnational medico legal Impasse, BIMA journal, inernational medico legal Impasse, BIMMA journal, v. 4, n. 7-8/2006:8-19, Sarajevo.
7. Remarks	<p>Student office hours are published in a separate schedule, which can be found on faculty website.</p> <p>Obligatory pre-agreed consultations via e-mail:</p> <p>studentska.sluzba@mf.unsa.ba</p>

COURSE PLAN: MEDICAL ETHICS AND SOCIOLOGY

Week	Teaching methods and materials	Number of hours
Week 1	Lectures: Medicine and other sciences	2
	Practical classes: Division of essay topics	1
Week 2	Lecture: Medicine and Bioethics/ Controversy over genetic engineering	2
	Practical classes: Student's presentation and discussion on essay topic: "The challenges of bio politics"	1
Week 3	Lectures: <i>The cloning controversy</i>	1
	Practical classes: Student's presentation and discussion on essay topic: "Human cloning controversy"	1
Week 4	Lectures: Medical ethics specificity	2
	Practical classes: Student's presentation and discussion on essay topic: "Medical deontology"	1
Week 5	Midterm exam 1	
Week 6	Lectures: Medicine and sociology	1
	Practical classes: Student's presentation and discussion on essay topic: "Individual and social dimensions of human being"	1
Week 7	Lectures: Normal and deviant behavior in society	2
	Practical classes: Student's presentation and discussion on essay topic: "Relations regulation among people"	1
Week 8	Lectures: Deviant behavior theories	1
	Practical classes: Student's presentation and discussion on essay topic: "Social pathology"	1
Week 9	Lectures: Personality socialization – learning about the role of medics	2
	Practical classes: Student's presentation and discussion on essay topic: "The importance of professional development for youth"	1
Week 10	Midterm Exam 2	

Week 11	Lectures: Health and lifestyle Practical classes: Student's presentation and discussion on essay topic: "The medicalization and its consequences"	1 1
Week 12	Lectures: "Risk society" – an attack on biological and ecological balance Practical classes: Student's presentation and discussion on essay topic: "Capital-interest ecologism"	1 1
Week 13	Lectures: Challenges of planetary imbalance Practical classes: Student's presentation and discussion on essay topic: "Population policy and its types"	1 1
Week 14	Lectures: Healthcare and society Practical classes: Student's presentation and discussion on essay topic:" Different forms of property and healthcare"	
Week 15	Medterm exam 3	
Week 17-18	Final exam (regular term)	
Week 19-20	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0104		Course title: FIRST AID	
Level: preclinical	Study year: I	Semester: I	ECTS: 2
Status: obligatory	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturers: Assistant Professor Slavenka Štraus MD PhD; Assistant Professor Amel Hadžimehmedagić MD PhD			
1. Overall aim	The overall aim of this First Aid Course is the acquisition of knowledge and skills in first aid, as well as an introduction to the basics of assessment of conditions caused by injuries and other medical emergencies.		
2. Course contents	<p>The following topics will be covered within the Modules:</p> <p>Module 1. Introduction to the subject. Vital signs and death. Assessment of patient (ABCDE). Basic life support (BLS) and Automatic external defibrillation (AED).</p> <p>The aim of this Module is to introduce students to the definition of first aid and first aider. Introduce students with monitoring vital signs and estimation of patient's condition. Give the definition and types of death and how to diagnose it. Current protocol of BLS, and basic heart rhythms which can be analysed by AED and how AED should be used.</p> <p>Module 2. Bleeding. Shock. Fractures. Immobilization. Recovery and transport position of patients.</p> <p>This Module deals with various injuries in which there is bleeding (external and internal) and various bone fractures, how to treat external bleeding, how to prevent / treat shock and how to immobilize different parts of the body, to give information about recovering positions of patients after cardio-pulmonary resuscitation and different illnesses treated by first aider.</p> <p>Module 3. Special conditions and the first aid 1. - Choking, Drowning, Burns, Frostbites.</p> <p>The aim of this Module is to learn about how chocking can be treated in adults, children and babies, to explane what are the first aid protocols for drowning, burns and frostbites.</p> <p>Module 4. Special conditions and the first aid 2. - Bites and stings, Poisoning, Seizures, Hyper/hypoglycemia, Stroke, Heart attack</p> <p>This Module will provide current protocols of first aid for treatment of bites and stings, poisoning, seasures, hyper and hypoglycemia in diabetis mellitus patients, how to recognise and what to do in the case of stroke and heart attack.</p>		

3.Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire the knowledge needed for rapid and immediate care of injured and sick, critically ill patients, taking care of their vital functions and how to conduct BLS.</p> <p><i>Through the lecture students will gain the following knowledge and competences:</i></p> <ol style="list-style-type: none"> 1. Know how to properly assess the state of ill or injured patient 2. Learn all measures and procedures that are most needed to provide help for critically ill patients (BLS protocol) 3. Understand how to treat and sustain the patient until further medical help arrives <p><i>Through the practical work students will acquire the following skills:</i></p> <ul style="list-style-type: none"> - Triage of injured and ill patients - Assessment of the patient - Heimlich manoeuvre - Techniques of artificial respiration - Chest compressions in adults and children - Control of external (internal) bleeding - AED - Immobilization devices and their application - Bandaging injuries - Transfer and transport of injured patients - Treatment of bites and stings - Treatment of burns and frostbites - Procedures in the case of hyperthermia, hypothermia, drowning and electric shock
4. Teaching methods	<p>Lectures: 7 hours</p> <p>Practical work: 13 hours.</p>
5. Method of knowledge assessment and examination	<p>The student's knowledge will be carried out continuously in the form Practical exam and Partial exam.</p> <p>Practical exam</p> <p>Practical exam includes list of mastery skills-practice lessons checklist. From the checklist the student has to answer on 4 questions, each question is rated 10 points. The maximum number of points is 40, the minimum number of points to successfully pass the exam is 25 points.</p> <p>Partial exam</p> <p>Partial exam consists of 30 questions of MCQ. Every correct answer carries 2 points, a total of 60 points. The minimum number of points for successfully passing the MCQ test is 33 points.</p>

Final exam

Students who did not pass the Partial exam and Practical exam take the Final exam. Final exam consists of 30 questions of MCQ. Every correct answer carries 2 points, a total of 60 points. The minimum number of points for successfully passing the MCQ test is 33 points. The condition for taking the written part of the Final examination has been passed the Practical Exam.

Repeated and Remedial exam

Repeated and Remedial exam takes place according to the previously defined criteria of the final examination.

All passed parts of the exam are valid until the end of the current academic year.

Forming a final grade

The total number of points won on all forms of testing is translated into the final grade as follows:

<i>Rating</i>	<i>Number of points</i>	<i>Description Rating</i>
10 (A)	95-100	remarkable success without mistakes or with minor errors
9 (B)	85-94	above average, with some mistakes
8 (C)	75-84	average, with subtle errors
7 (D)	65-74	generally good, but with significant shortcomings
6 (E)	55- 64	meets the minimum criteria
5 (F,FX)	< 55	does not meet the minimum criteria

6. Literature	<p>Recommended:</p> <ul style="list-style-type: none"> – European Resuscitation Council. www.erc.edu – First aid Guidelines 2015. AHA and Red Cross Guidelines for First Aid. www.eccguidelines.heart.org – St. John Ambulance, St. Andrew's First Aid, British Red Cross. First aid manual. Revised 10th edition, 2016 – Nigel Barraclough. CPR and AED. First Aid, made easy: A comprehensive Guide to Resuscitation and Automated External Defibrillation. DK 2015. – International Federation of Red Cross and Red Crescent Societies. International first aid and resuscitation guidelines 2016. www.ifrc.org <p>Additional:</p> <ul style="list-style-type: none"> – Hadžiahmetović Z. Urgentna medicinska pomoć. Sarajevo 2008. – National Safety Council. First aid, CPR and AED. Jones and Bartlett 2018.
7. Remarks	<p>All forms of teaching are mandatory. The student can have a maximum of 20% of justified absences from teaching. Lectures and exercises will be held according to the plan and program at the University Clinical Center in Sarajevo.</p> <p>Student office hours are published in a separate schedule, which can be found on faculty website. Obligatory pre-agreed consultations among students and lecturer by e-mail: vstraus@yahoo.com, every day in the period of 12h to 14h ;or by: klinicke.katedre@mf.unsa.ba</p>

COURSE PLAN: FIRST AID

Week 9.	The form of teaching	Number of hours
Tuesday	Lecture: Introduction to the subject. Vital signs and death. Assessment of patient (ABCDE). Basic life support (BLS) and Automatic external defibrillation (AED). Bleeding. Shock. Fractures. Immobilization. Recovery and transport position of patients.	3
	Exercise: Checking of vital signs, BLS - techniques of artificial respiration in adults and children, Chest compressions in adults and children. Types of control of external bleeding, Bandaging, Application of immobilization devices, Transport and recovery positions.	3
Wednesday	Lecture: Special conditions and the first aid 1. - Choking, Drowning, Burns, Frostbites.	2
	Exercise: Heimlich manouver, 5 back blows, first aid protocols for drowning, burns including electrical burns (treatment) and frostbites (treatment).	4
Thursday	Lecture: Special conditions and the first aid 2. - Bites and stings, Poisoning, Seizures, Hyper/hypoglycemia, Stroke, Heart attack.	1
	Exercise: First aid treatment for bites and stings, first aid protocols for poisoning, seizures, stroke, heart attack and hypo/hyperglycemia in diabetic patients.	5
Friday	Lecture: <i>Partial exam</i>	1
	Exercise: <i>Practical exam</i>	1
Weeks 17-18	Final exam (regular term)	
Week 19-20	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0105		Course title: INTRODUCTION TO MEDICINE AND HISTORY OF MEDICINE	
Level: preclinical	Study year: I	Semester: I	ECTS: 2
Status: obligatory	Total contact hours: 30		
Prerequisites:	None		
Lecturers: Professor Amela Džubur-Alić Md PhD			
1. Overall aim	Observing uninterrupted connection between the past and present of medicine as a prerequisite for understanding and teaching of medicine.		
2. Course contents	<p>In the course of teaching the Introduction to Medicine and history (history) of medicine, student will acquire the following knowledge:</p> <p>Modul. 1. History of understanding of health and disease The aim of this module is to look at how to observe health and illness through history from the point of view of individuals, doctors and society.</p> <p>Modul 2.History of popular and expertise knowledge of leading diseases The aim of this module is to give a chronological overview of the development of medical thought and practice through the development of healthcare measures through the application of the latest methods of diagnostics and treatment.</p> <p>Modul 3. Giants of medical thought and practice The aim of this module is to get acquainted with leading medical scientists.</p> <p>Modul 4. The emergence of the medical profession The goal of the module is to see the emergence of the medical profession and the contribution of the doctor to the development of medical thought and practice.</p> <p>Modul 5. A short overview of the development of medicine in Bosnia and Herzegovina, with regard to the specifics of individual areas The goal of the module is to look at the specificities in development of medicine in Bosnia and Herzegovina</p>		
3. Learning outcomes (Knowledge, skills and competences)	Students will take a historical approach of observation and research in medicine, noting the concrete examples of medical history Students will note the way of observation of health and disease through history from the standpoint of the individual, doctors and society The student will give a chronological overview of the development of medical thought and practice through the development of health care		

	<p>through the application of the latest methods of diagnosis and treatment. Students will be introduced to the leading scientists in the field of medicine and become familiar with the development of the medical profession and contribution of doctors to the development of medical thought and practice with regard to the specifics of individual areas. Students will observe the specifics of the development of medicine in Bosnia and Herzegovina</p> <p><i>Through the lectures and seminars the students will gain following knowledge and competences:</i></p> <ol style="list-style-type: none"> 1. observation of health and disease through history from the standpoint of the individual, doctors and society 2. giving a chronological overview of the development of medical thought and practice 3. observing the specifics of the development of medicine in Bosnia and Herzegovina <p><i>Through the practical work students will acquire following skills:</i></p> <ul style="list-style-type: none"> – Finding historical sources and their proper use – Acquire methodology of the seminar preparation – Public presentation of the seminar and leading discussions on a given topic
4. Teaching methods	<p>Lectures :10 hours</p> <p>Seminars: 10 hours</p> <p>Practical work:10 hours</p>
5. Method of knowledge assessment and examination	<p>Practical work carries out a continuous ability check of skills. The total score of the practical work is maximum 15 points and for seminars is 15 points. Seminar without presentation is 9 points and for practical work minimum for passing the test is 10 points.</p> <p>The partial exam consists of MCQ questions and essays.</p> <p>In the first partial exam, a student can win a maximum of 35 and at least 18 points. In a partial exam, the student in the practical part of exam can win a maximum of 15 points and at least 8 points to pass the test. Within the first partial exam, the student also has a theoretical part where he/she can win a maximum of 20 and at least 10 points for passing the test.</p> <p>In the second partial exam, the student can win a maximum of 35 and at least 18 points. In a partial exam, the student in the practical part of exam can win a maximum of 15 points and at least 8 points to pass the test. Within the second partial exam, the student also has a theoretical part where he/she can win a maximum of 20 and at least 10 points for passing the test.</p>

	<p>A partial exam will be considered passed if the student has gained the least points on the practical and theoretical part.</p> <p>If the student did not pass one of the partial exams on the honorary degree, he / she would take that part in the final exam.</p> <p>The final exam for students who did not complete both of the partial exams implies a complete integral exam. On an integral exam, a student can earn a maximum of 70 and at least 36 points to pass the test.</p>
6. Literature	<p>Obligatory:</p> <ul style="list-style-type: none"> – Lois N. Magner, A History of Medicine, second edition, Taylor & Francis, 2005
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: socijalna.medicina@mf.unsa.ba</p>

COURSE PLAN: INTRODUCTION TO MEDICINE AND HISTORY OF MEDICINE

Week	Form of teaching	Number of hours
Week 1.	Lecture: Introduction to the study of medicine (historical sources, documentation of the development of medical thought) Practical classes: Displaying the learning method	1 1
Week 2.	Lecture: History of understanding health and disease (way of looking at and observing health and disease through history from an individual, society, and doctors perspective) Practical classes: The perception of health and disease in the Greek-Roman culture (the formation of the first schools for medical education)	1 1
Week 3.	Lecture: Development of the medical profession Practical classes: The most important doctors throughout different stages of medical development	1 1
Week 4.	Lecture: The emergence of the medical profession and female doctors (involvement of women in the medical profession and their contribution to medicine) Practical classes: Florence Nightingale, contribution to the development of medical care and a significant physician and nurse in medicine, the development of nursing as a profession	1 1
Week 5.	Lecture: History of professional knowledge and practice on leading diseases (chronological review of development of expert knowledge - ways of treatment, observation of diseases) Practical classes: Establishment of medical faculties in the world	1 1
Week 6.	Lecture: History of folk knowledge on leading diseases (chronological review of the development of folk medicine - beliefs, ways of treatment, observation of diseases) Practical classes: Magic and belief in folk medicine	1 1
Week 7.	Partial exam 1	2
Week 8.	Lecture: The most important doctors of medical thought and practice (getting acquainted with leading medical scientists from the period of Greek-Roman culture and the medieval period) Practical classes: The most important doctors in history of medicine	1 1

Week 9.	Lecture: The most important doctors of medical thought and practice (getting to know leading medical scientists from the Renaissance to the XIX century)	1
	Practical classes: The most important doctors of medical thought and practice	1
Week 10.	Lecture: The most important doctors of medical thought and practice (getting to know the leading scientists in medicine field of the 20th century)	1
	Practical classes: Doctors Nobel laureates, a discussion of the most important scientists and their discoveries	1
Week 11.	Lecture: The most important doctors of medical thought and practice (getting acquainted with leading scientists in the field of Arabic medicine)	1
	Practical classes: "Canon of medicine" - a discussion on the contribution to Avicenna's progress in medicine	1
Week 12.	Lecture: A brief overview on development of medicine in Bosnia and Herzegovina (stages in development of medical thought)	1
	Practical classes: The beginnings of medicine development in BiH	1
Week 13.	Lecture: Medicine in Bosnia and Herzegovina at the period of Ottoman and Austro-Hungarian sovereignty	1
	Practical classes: The most important doctors in Bosnia and Herzegovina	1
Week 14.	Lecture: Health care measures through the application of the latest methods of diagnostics and treatment	1
	Practical classes: Development of anatomy, physics, chemistry and biology	1
Week 15.	Partial exam 2	2
Week 17-18.	Final exam (regular term)	
Week 19.-20.	Finale exam (make-up examination exam)	
September	Final exam (September term)	

Code: MFSE 0106	Course title: Medical physics and biophysics		
Level: preclinical	Study year: I	Semester: I	ECTS: 4
Status: obligatory	Total contact hours: 50		
Prerequisites:	According to the study Regulation		
Lecturers: Associate Professor Mustafa Busuladžić PhD, Assistant Zijad Muharemović MSc			
1. Overall aim	The overall aim of Medical Physics and Biophysics Course is to provide knowledge of different areas of physics that play important role in medicine and biology.		
2. Course contents	<p>The following topics will be covered during the Modules:</p> <p>Module 1: Biomechanics.</p> <p>Module 2: Physics of cardiovascular and respiratory system.</p> <p>Module 3: Thermodynamics of living systems. Molecular transport phenomena.</p> <p><i>Module 4: Sound in medicine. Physics of the ear and hearing.</i></p> <p>Module 5: Electricity within body. Applications of electricity and magnetism in medicine.</p> <p>Module 6: Optics in medicine. Physics of the eyes and vision.</p> <p>Module 7: Radiation and Health.</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge from different areas and will be able to describe the most important applications of basic physics concepts in medicine and biology. Specially, students will be able to describe the role of physics in understanding the function of the various organ systems of the body such as the eyes, the ears, the lungs and the heart.</p> <p><i>Through the lectures and seminars, the students will gain following knowledge and competences:</i></p> <p>1. Understand basic concepts of kinematics, the concept of force and its relationship to motion of the human body. Learn how the use of forces and torques allows a person to walk, to lift an object, or to maintain balance as well as understanding of elastic and plastic deformation of biomaterials.</p> <p>2. Know the concepts of ideal and real fluids, pressure in the body, and blood flow. Understand the nature of surface tension, capillarity, and recognize their significance in medicine.</p> <p>3. Learn about energy concept in the body, including discussions on work, temperature and heat, as well as metabolism. Discover how conduction, convection and radiation transfer thermal energy between the human body and its <i>environment. Develop basic knowledge about diffusion, osmosis and osmotic pressure.</i></p>		

	<p>4. <i>Obtain knowledge about the production and transmission of sound waves</i>, principles of sound applied to speech and hearing.</p> <p>5. Discover the types of charge and the origins of the electric force, electric potential and electric potential energy, the nature of the current flow. Learn about electrical properties of the body and magnetism.</p> <p>6. Develop basic knowledge about basic nature of light, principles of geometric optics and its applications for image formation by lenses and mirrors. Vision.</p> <p>7. Understand the structure of the atom, and applications of radiation in imaging and cancer treating.</p> <p><i>Through the practical laboratory work students will acquire following skills:</i></p> <ul style="list-style-type: none"> -Density of surgical steel and water - Surface tension -Viscosity and meteorological parameters -Calorimetry -Speed of sound -Direct current -Alternating current -Optics -Photometry and He-Ne laser -Vocal tract as source of sound
4. Teaching methods	<p>Lectures: 28 hours</p> <p>Practical work: 22 hours</p>
5. Method of knowledge assessment and examination	<p>-Written tests in the form of Multiple choice questions (MCQ) tests and Extended response questions (ERQ) tests</p> <p>-Oral examination</p> <p>Continuous knowledge and skills assessment will be carried out through Partial exams.</p>
6. Literature	<p>Obligatory:</p> <ul style="list-style-type: none"> – Franklin K, Muir P, Scott T, Wilcocks L, Yates P. Introduction to Biological Physics for the Health and Life Sciences. 1 st edition, New York: Wiley; 2010. – McCall R P. Physics of the human body. 1 st edition, Baltimore: Johns Hopkins University Press; 2010. – Cameron J R, Skofronick J G , Grant R M, Physics of the body. 2 nd edition, Madison: Medical Physics Pub Corp; 1999.

7. Remarks	Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: biofizika@mf.unsa.ba
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COURSE PLAN: MEDICAL PHYSICS AND BIOPHYSICS

Weeks	Form of Instructions and materials	Number of classes
Week 1.	<p>Lectures: Terminology, modeling, and measurement. The use of mathematics. Scientific notation and significant figures. Units. Converting units.</p> <p>Motion in one dimension. Basics of kinematics. Position and displacement. Displacement Versus Distance. Velocity: Rate of change of position. Average Velocity. Instantaneous Velocity.</p>	2
Week 2.	<p>Lectures: Acceleration: Rate of change of velocity. Average Acceleration. Motion with constant acceleration. Free fall. Effects of acceleration on humans. Motion in plane.</p> <p>The concept of force. Force and Newton's law of motion. Kinds of force. Conservative forces. The gravitational force. Some effects of gravity on the body. Contact forces. Frictional forces and normal walking. Other forces on and in the body.</p>	2
Week 3.	<p>Lectures: Motion in circle. Description of circular motion. Angular velocity and angular acceleration. Centripetal force. Sources of centripetal force.</p> <p>Equilibrium. Static and dynamic equilibrium. Torque. The principle of moments. Levers. Classes of Levers in the human body. Centre of gravity (centre of mass). Rigid objects in equilibrium. Stability. Applications in medicine.</p>	2
Week 4.	<p>Lectures: Energy. Forms of energy. Work done by a constant force. Kinetic energy. The work-energy theorem and kinetic energy. Potential energy. Conservation of total energy. Conservative versus nonconservative force. Applications in medicine and biology. Power. Mechanical efficiency of the human body.</p> <p>Practice: I DENSITY OF SOLIDS AND LIQUIDS</p> <p>a.) Determine density of surgical stainless steel by pycnometer.</p> <p>b.) Determine the density of a liquid using a Mohr-Westphal balance and measure the temperature dependence of the density of the distilled water</p> <p>c.) Determine specific weight and relative density of liquid</p>	2
Week 5.	<p>Lectures: Fluid and pressure. Pressure and the human body. Blood pressure and its measurement. Pressure due to weight of a fluid. Buoyancy and Archimede's principle. Surface tension and capillarity. Pressure in bubbles.</p>	2

	<p>Laplace's law. Physics of alveoli.</p> <p>Practice: II SURFACE TENSION OF LIQUIDS</p> <ul style="list-style-type: none"> a.) Determine coefficient of surface tension of liquid by stalagmometric method (drop-weight method) b.) Determine coefficient of surface tension of liquid by capillary-rise method c.) Demonstration of Laplace's law (model of alveoli) 	2
Week 6.	<p>Lectures: Fluids in Motion. Fluid dynamics of non-viscous fluids. Characteristics of fluid flow. Flow rate. The equation of continuity. Bernoulli's equation. Bernoulli's principle applied to the cardiovascular system. Fluid dynamics of non-viscous fluids. Viscosity. Poiseuille's law. Applications to the human body.</p> <p>Practice: III VISCOSITY OF FLUIDS</p> <ul style="list-style-type: none"> a.) Determine coefficient of dynamic viscosity of liquid. b.) Determine coefficient of kinematic viscosity of liquid c.) Determine coefficient of dynamic viscosity of protein solution d.) Model of lung (biomechanics of respiration) e.) Calculate the <i>hydraulic resistance</i> of small <i>blood</i> vessels 	2
Week 7.	<p>Lectures: Temperature and heat. Thermal equilibrium. Temperature scales. Measuring temperature. The laws of thermodynamics and their applications to the human body. Conservation of energy in the body. Heat and body temperature. Heat losses from the body. Heat loss by radiation. Heat loss by convection. Heat loss by evaporation.</p> <p>Diffusion. Fick's law. Diffusion and lung. Osmosis. Osmotic pressure. Applications to the human body.</p> <p>Practice: IV SPECIFIC HEAT CAPACITY</p> <ul style="list-style-type: none"> a.) Determine the amount of heat received from the warm body system, consisting of calorimeter and water, during the process of cooling and calculate the mean specific heat of matter from which the body is built 	2

Week 8.	<p>Mid-term exam 1 (Partial exam 1)</p> <p>Practice: V SPEED OF SOUND</p> <p>a.) Determine the speed of sound in air with a resonance tube</p> <p>b.) Determine of the speed of sound in metal rod using <i>Kundt's</i> tube</p> <p>c.) Calculate acoustic impedance of the air and metal rod.</p> <p>d.) Calculate the proportion of reflected intensity of a sound wave traveling from metal</p>	<p>1</p> <p>2</p>
Week 9.	<p>Lectures: Simple harmonic motion and waves. Types of wave. Superposition and interference. Sound and hearing. General properties of sound. Production and detection of sound. Reflection and transmission of sound at barriers. Acoustic impedance. Intensity of sound. Sound intensity level. Effects of resonance in the ear canal.</p> <p>Ultrasound. Ultrasound imaging. Ultrasound to measure motion.</p> <p>Mid-term exam 1 (Partial exam 1)/Practice</p>	<p>2</p> <p>1</p>
Week 10.	<p>Lectures: Electric charge. Electric force. Electric field. Electric potential energy. Electric potential. Electric potential difference and potential energy. Capacitance. Current and Resistance. Electricity in the Body. Potential differences in biological systems. Applications: electrocardiogram (ECG or EKG), the electroencephalogram (EEG), the electromyogram (EMG), and the defibrillator.</p> <p>Practice: VI OPTICS – Lens focal length measurements</p> <p>a.) Determine focal length and optical power of a convex lens using thin lens equation method</p> <p>b.) Determine focal length and optical power of a convex lens using Bessel's method</p> <p>c.) Determine focal length and optical power of a convex lens using Abbe's method</p> <p>d.) Determine focal length and optical power of a concave lens using method of combination a convex and a concave lenses</p> <p>e.) Model of microscope</p>	<p>2</p> <p>2</p>

Week 11.	<p>Lectures: Magnetism. The magnetic force and field. Force on charges in a magnetic field. Applications in medicine. Cyclotron. Electromagnetic blood flowmeter. Faraday's law and Lenz's law. The basics of magnetic resonance imaging.</p>	2
	<p>Practice:</p> <p>VII RESISTORS IN DIRECT CURRENT (DC) CIRCUITS</p> <p>a.) UI method (Ohm's Law)</p> <p>b.) Wheatstone bridge (Kirchhoff's rules)</p> <p>c.) Biological membrane as electrical equivalent circuits</p>	2
Week 12.	<p>Lectures: Electromagnetic Waves. Visible Light. Waves and Rays. Geometric Optics. Reflection and refraction of light. Total Internal Reflection. Application in medicine. Refraction by a lens. Real and Virtual Images. Focal length of a lens. Thin lens equation. Path of light into the eye. Near point and far point. Defective vision and its correction. Color vision and chromatic aberration. Instruments used in ophthalmology.</p>	2
	<p>Practice: VIII RESISTORS IN AC CIRCUITS</p> <p>a.) Resistors, capacitors and inductors in AC circuits</p> <p>b.) Electrical impedance and admittance</p> <p>c.) Bioelectrical impedance analysis</p>	2
Week 13.	<p>Lectures: Atom and atomic physics. Parts of the atom. Orbitals and energy levels. Emission and absorption spectra. The Bohr model of atom. Quantum mechanics.</p>	2
	<p>The nucleus and nuclear physics. Nuclei and isotopes. Protons and neutrons. Nuclear forces. Nuclear decay processes. Activity and half-life.</p> <p>Practice: IX IONIZING RADIATION</p> <p>a.) Determine <i>linear absorption coefficient</i> of lead and aluminium using GM counter</p> <p>b.) Determine <i>mass absorption coefficient</i> of materials</p>	2
Week 14.	<p>Lectures: Interactions of ionising radiations with tissue. Detection of ionising radiation. Biological effects of ionising radiation.</p>	2

	Practise: X MEDICAL ELECTRONICS a.) Determine <i>current-voltage characteristic</i> of the semiconductor <i>diode</i> . b.) Oscilloscope and <i>diadynamic currents</i>	2
Week 15.	Mid – term 2 (Partial exam 2)	(1+1)
Week 17-18.	Final exam (regular term)	
Weeks 19–20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0107	Course title: Bosnian Language 1		
Level: preclinical	Study year: I	Semester: I	ECTS: 2
Status: obligatory	Total contact hours: 30		
Prerequisites:	According to the Study Regulation		
Lecturers:	Engaged teachers from the core faculty		
1. Overall aim	Students learn basis of Bosnian language. They understand simple and familiar words and very basic phrases. They are able to use vocabulary related to personal and family information and understand simple sentences and use simple questions. They can read very simple text and communicate in simple and routine tasks. Introduction of basic medical vocabulary.		
2. Course contents	Students can understand simple sentences and frequently used information related to themselves, their family and everyday activities. They can communicate using very simple sentences and frequently used words. They are familiar with basic medical vocabulary.		
3. Learning outcomes (Knowledge, skills and competences)	<p>Listening: After this course, students can understand basic phrases and vocabulary related to greetings, introduction, situations in the hotel, on the street, on the airport etc.</p> <p>Reading: Students can read simple text. They are able to find specific information in simple everyday material such as menus and timetables.</p> <p>Speaking: Communication on this level is based on exchange of very simple information on familiar topics and activities. They can present themselves and keep simple social information exchange.</p> <p>Writing: The students can write simple, short notes related to their background, their daily activities or to their family, for example. They use simple medical words and phrases.</p> <p>Grammar: Students are expected to achieve a level of corresponding knowledge of the very basic Bosnian grammatical structures as well as the main usage features of the language.</p>		
4. Teaching methods	<p>The course is performed in form of</p> <p>Lectures (15)</p> <p>Practical works (15)</p>		
5. Method of knowledge assessment and examination	<p>EXAM</p> <ol style="list-style-type: none"> 1. Partial exam (8. week) 2. Final exam (after the course) 		

6. Literature	<p>Obligatory:</p> <ul style="list-style-type: none"> – Midhat Riđanović, Bosnian for Foreigners, Spirit of Bosnia Volume 7 No. 3 (2012) (selected parts) – Minela Kerla i Nermina Alihodžić-Usejnovski, Bosanski jezik: komunikacijski priručnik za strance sa zadacima i vježbama, Sarajevo, 2013 (selected parts) – English-Bosnian dictionary upon own choice
7. Remarks	<p>Student office hours are published in a separate schedule, which can be found on faculty website. Pre-agreed consultations are obligatory and can be done by e-mail: studentska.sluzba@mf.unsa.ba</p>

COURSE PLAN: BOSNIAN LANGUAGE I

Week	Methods of teaching and materials	Number of hours
Week 1.	Lecture: Bosnian sounds and alphabets. Pronunciation of Bosnian: vowels and consonants. Stress.	1
	Practical work: Listening and repeating pronunciation of characteristic simple Bosnian words. Writing words.	1
Week 2.	Lecture: Personal pronoun and verb to be.	1
	Practical work: Greetings and introducing. Speaking and writing exercises.	1
Week 3.	Lecture: Demonstrative pronouns and nominative. Gender and number of nouns.	1
	Practical work: Identifying people. Identifying objects in the classroom, in the pictures etc. Speaking and writing exercises.	1
Week 4.	Lecture: Numbers. Cardinal numbers.	1
	Practical work: What time is it? Time schedules. Prices. Counting. Speaking and writing exercises.	
Week 5.	Lecture: Basic conjugations. Present tense.	1
	Practical work: Names of days. Describing everyday activities. Speaking and writing exercises.	1
Week 6.	Lecture: Accusative case.	1
	Practical work: Whom/what do I see/hear? Expressing visual and auditive perception. Expressing attitudes towards people and objects. Speaking and writing exercises.	1
Week 7.	Lecture: Expression of possession. Verbs of possession.	1
	Practical work: Family and other relationship names. My possessions. Speaking and writing exercises.	1
Week 8.	HALF-SEMESTER (PARTIAL) EXAM	2
Week 9.	Lecture: Adjectives and adverbs.	1
	Practical work: Describing the physical appearance of people. Describing the physical characteristics of objects. Colours. Circumstances (place, time, manner). Speaking and writing exercises.	1
Week 10.	Lecture: Possessive pronouns.	1

	Practical work: People relations. What do I have? Clothes and shoes. Speaking and writing exercises.	1
Week11.	Lecture: Pronouns and adjectives in accusative.	1
	Practical work: Everyday life. Making shopping list. Speaking and writing exercises.	1
Week 12.	Lecture: Asking questions. Yes/no-questions and wh-questions.	1
	Practical work: Finding information on the street. Situation at the restaurant. Speaking and writing exercises.	1
Week 13.	Lecture: Modal verbs.	1
	Practical work: Expressing will, desire, possibility, necessity, permission etc. Describing job duties. Speaking and writing exercises.	1
Week14.	Lecture: Past tense. The perfect.	1
	Practical work: It was my experience. Telling short stories. Speaking and writing exercises.	1
Week 15.	Lecture: Recapitulation of the grammar learned during the course.	1
	Practical work: Spontaneous conversation. Speaking and writing exercises.	1
Week 17-18.	FINAL EXAM AND EXAM FOR STUDENTS WHO DID NOT PASS PARTIAL EXAM. (regular term)	2
Week 19-20	Final exam (make-up examination term).	
September	Final exam (September term)	

Code: MFSE 0108	Course title: Anatomically –Anthropological significance of the skull		
Level: preclinical	Study year: I	Semester: I	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturers: Associate Professor Aida Sarač – Hadžihalilović, PhD, MD; Master of Science Assistant Zurifa Ajanović, MD			
1. Overall aim	The overall aim of the Anatomically-Anthropological significance of the skull Course is that student gains knowledge of anatomy cranium and new objectives through anthropometric and anthroposcopic approach.		
2. Course contents	The following topics will be covered during Modules: Module1. The application of the medical anthropology in skull categorization on the basis of its asymmetry Module 2. Categorization of the skull on the basis of the standard categories of its length, width, cephalic index and cranial capacity Module 3. Sexual dimorphism of the skull		
2. Learning outcomes (Knowledge, skills and competences)	Student will acquire knowledge which will introduce students with application of the skull categorization on several levels starting with its asymmetry, estimation of its capacity, cephalic index and application of its sexual dimorphism, which is a necessary prerequisite for skull understanding, as the most complex part of the human body skeleton. Through the lecture the students will gain following knowledge and competences: 1. The understanding the anatomically – antropological aspect of skull categorization on the basis of its asymmetry. Introducing with the kyphosis and skull base formation as well as their cause and effect mechanisms. Distinguishing of positive and negative aspects of osteometric and osteoscopic methodsin assessing the type of the skull on the basis of its asymmetry. 2. The understanding of the importance of the cranial capacity assessment and cephalic index, their gender and population differences. The understanding of the complicated processes of kyphosis skull base and its formation, dominant repercussions in these processes on definite skull categorization basis on standard		

	<p>categories of its length, width and cephalic index, as well as formation of the cranial capacity values. Skull categorization of dolichocephalic toward brachycephalic, from prehistoric to recent times. Two evolutionary tendencies – gracilisation and brahicanisation started in anthropological development.</p> <p>3. Learn how to recognition morphognostic gender skull markings and their qualitative assessment. Univariate and multivariate impact of particular linear skull diameters on quantitative assessment of gender based on human skull. Application of discriminatory functional analyses (Hanihara I, HaniharaII and Giles – Eliot) on population oriented to gender determination based on human skull.</p> <p>Through the practical work student has to perform practically following skills:</p> <p>3. Measuring frontooccipital, parietooccipital, temporooccipital and frontoparietal oblique skull diameter in oder to perform quantitative assessments of its asymmetry</p> <p>4. Measuring cranial length and width; determine standard category of the length and width of the head</p> <p>5. Measuring cranial length, width and height with applying into cranial capacity calculation method</p> <p>6. Measuring cranial length and width with applying into cranial categorization skull method based on cephalic index</p> <p>7. Measuring eight linear dimensions of the skull (glabella-opisthion; porion –porion; vertex-porion; zygion-zygion; nasion-alveolare; basion-nasion; basion-prosthion and prosthion-nasion), with applying in discriminatory functional analysis by Hanihari I, Hanihari II and Giles –Eliot for gender skull determination</p>
4. Teaching methods	<p>Leactures: 10 hours</p> <p>Practical work: 10 hours</p>
8. Method of knowledge assessment and examination	<ul style="list-style-type: none"> - Continuous knowledge and skills assessment will be carried out through practical and theoretical evaluation knowledge assessment after each module - Final exam: practical and theoretical evaluation knowledge assessment of the module or modules that has not been positively evaluated in Continuous knowledge and skills assessment

6.Literature	<p>Recommended</p> <ul style="list-style-type: none"> – Sarač – Hadžihalilović A. Anatomically – anthropological significance of the skull – English edition (fakulty textbook). Medical faculty University of Sarajevo, 2017. ISBN: 978-9958-608-90-2 – Elfaki A.A., Sarač – Hadžihalilović A., Ali Q.M., Nahir M. Skull in Anatomy of head and Neck in Guide to Practical Anatomy. First Edition. Text book. Medical faculty of National University – Sudan, 2018. ISBN: 978-99924-0-252-2 – in press – Schmitt D, Christine E. Walland Pierre Lemelin, Experimental Comparative Anatomy in Physical Anthropology: The Contributions of Dr. William L. Hylander to Studies of Skull Form and Function in Primate Craniofacial Function and Biology, Springer, 2008 – Wayne H. S, Montgomery J.L, Henryson G.L, Atlas of Human Skull, Texas: A&M University Press, 1991
7.Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN: ANATOMICALLY-ANTHROPOLOGICAL SIGNIFICANCE OF THE SKULL

DAY	Theaching methods and materials	Number of hours
Monday	<p>Skull as a whole. Skull asymmetry. Skull standardization based on its asymmetry. Oblique diameters of the skull. Angulation of the skull base. Asymmetry of the internal structures of skull basis. Interactive relations asymmetry of neurocranium and viscerocranium. (L)</p> <p>Analysis of macerated and digressive skull. Assessment of the type of the skull due to its appearance and configuration of occipital part. Displaying of anteroposition petrosus part of temporal bone, regarding the type and configuration of the observed skull base. Spotting the position of the posterior part of lesser wing of sphenoidal bone according to the skull asymmetry. Analysis of the configuration cranial fossa (anterior, middle and posterior cranial fossa) in the relation to the type of the skull. The application of the cephalometer in measuring of frontooccipital, parietooccipital, temporooccipital and frontoparietal oblique diameter of the skull. (P)</p>	<p>2</p> <p>2</p>
Tuesday	<p>Anthropometric points. Linear dimensions of the skull (cranial length, cranial width, cranial height, width of the face, upper facial height, total height of the face, length of the skull base). Standard categories of the head length. Standard categories of the width of head. The significance of their assessment. Gender, population and development anthropological differences. Mutual conditionality of the skull length and width. (L)</p> <p style="text-align: center;">1. Practical knowledge assessment</p> <p>Recognizing of the odd and even anthropometric points of the skull. Application of the cephalometry and sliding calipers at craniometrical measurements of the skull linear dimensions. Evaluation of the standard categories of cranium length (very short, short, medium length, long, very long) on macerated and digressive skulls. Evaluation of the standard categories of the cranium width (very narrow, narrow, medium, wide, very wide) on macerated and digressive skulls. (P)</p>	<p>2</p> <p>2</p>
Wednesday	<p>Cranial capacity. Craniometrical method for the assessment of cranial capacity. The significance of its assessment. Cranial capacity from the prehistoric to the recent times. Evolutionary tendencies: knowledge of man and brahmanisation. Cranial capacity based on gender and population differences. Cephalic index from prehistoric period to the recent times. The declining trend of the skull length from the dolichocephali to the ultrabrahicephali category. The growing tendency of the skull width from dolichocephali category to the</p>	<p>2</p> <p>2</p>

	ultrabrahicepali category. (L) Calculation of the cranial capacity by craniometrical method to macerated and digressive skulls. Determination of the standard categories of cephalic index(hyperdolichocephali, dolichocephali, mesocephali, brachicephali, hyperbrachicephali, ultrabrahicephali) by application of cranial method on macerated and digressive skulls. (P)	
Thursday	Sexual dimorphism of the skull. Morphognostic gender labels significant in sex determination of the human skull. Univariate and multivariate influence of certain linear diametres in determination of the gender of the skull. (L) 3. Practical knowledge assessment Spotting of the morphognostic gender signs (expression of frontal et parietal tuber, expression superciliary arch and glabella, supraorbital margin, appearance of orbit and root of the nose, expression of mastoid process and relief of the muscle insertions, size of the teeth and shape of the face) on macerated and digressive skulls. (P)	2 2
Friday	Application of discriminating of functional of analysis (Hanihara I, Hanihara II, Giles – Eliot). Population oriented determining of the gender of the skull with the help of discriminant functional analysis. (L) Applying the formula Hanihara I, Hanihara II and Giles – Eliot and their selective points in determining the gender on macerated and digressive skulls. (P) Practical knowledge assessment (P)	2 2
Week 17-18.	Final exam (regular term)	
Week 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MSFE 0109	Course title: Applied Anatomy of Pelvis		
Level: preclinical	Study year: I	Semester: I	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturers: Associate Professor Ilvana Hasanbegovic MD, PhD			
1. Overall aim	The overall aim of the elective course “Applied Anatomy of Pelvis” provides opportunity for first-year medical students to apply in order to extend and refine their basic anatomical knowledge within the context of applied anatomy of pelvis in a clinical setting. This elective provides a longitudinal bridge between the first – year basic science anatomy courses and the third year clinical clerkship.		
2. Course contents	The following topics will be covered during the Modules: Module 1. Pelvic girdle Module 2. Pelvic cavity (neurovascular structures of pelvis; pelvic viscera)		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire thoroughly knowledge of anatomy of the pelvis and pelvic viscera, their location and their spatial and functional relationship. Studying the anatomy of the pelvis and the disposition of the pelvic organs students will be able to notice and distinguish considerable sexual differentiation. Knowledge of gross anatomy of pelvis will be linked to both their functional and clinical relevance. Through practical work students will reinforce basic anatomy knowledge, be able to evaluate certain clinical problems that can be explained on the basis of anatomical knowledge and grasp the relation between the anatomy and other basic medical and clinical disciplines.</p> <p><i>Through the lectures the students will gain following knowledge and competences:</i></p> <ul style="list-style-type: none">- Understand anatomic nomenclature and the Latin terminology- Describe gross anatomical structure with precision and clarity- Understand the structural and functional relation of pelvic organs- Identify clinically relevant structures in pelvic region regarding sex differences- Identify major anatomical structures in pelvis using radiographs, ultrasound, CT, MRI images- Understand clinical correlations associated with the major structures in pelvis- Utilize anatomical foundation required for continued advanced study in clinical clerkships <p><i>Through the practical work students will acquire following skills:</i></p>		

	<ul style="list-style-type: none"> - Orientation on the human pelvic skeleton and pelvic viscera - Recognition of anatomical structures and their relationships in the region of the pelvis - Recognition and correlation of anatomical structures with radiological images - Understand the ethical issues and responsibilities in using the human body for knowledge, including demonstration of a professional attitude - Work in small groups during practical work to develop communication skills
4. Teaching methods	<p>Lectures: 10 hours</p> <p>Practical work: 10 hours</p>
5. Method of knowledge assessment and examination	<p>-There will be two examinations, one for each of the two modules covered. Each exam will consist of written tests in the form of – Multiple choice questions (MCQs) tests.</p> <p>- Attendance will be taken into account for grading purpose. Overall success is vitally dependent on interaction with the course material and participation in course during Lectures and Practical work.</p>
6. Literature	<p>Recommended</p> <ul style="list-style-type: none"> – Richard S. Snell, Clinical Anatomy. Lippincott Williams & Wilkins 2003. – Moore KL, Dalley AF. Clinically oriented anatomy. Philadelphia: Lippincott Williams & Wilkins, 1999. – Sobotta J. Atlas of Human Anatomy Elsevier, 2013.
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN: APPLIED ANATOMY OF PELVIS

DAY	Theaching methods and materials	Number of hours
Monday	<p>Review of pelvic skeleton, main characteristics, pelvic girdle. Bone landmark. Sexual dimorphism of pelvis and its application in forensic medicine. Types of pelvis and their anatomical basis in obstetrics. (L)</p> <p>Review of pelvic joints. Radiographic images of the pelvis. The most common fractures of the pelvis. (L)</p> <p>View and orientation of the pelvic skeleton (hip bone, sacrum, coccyx). Diameters of the pelvis and its application in obstetrics. Analysis of pelvic joints and ligaments (pubic symphysis, sacroiliac joint, sacrotuberous ligament, sacrospinalis ligament, obturator membrane). (P)</p>	<p>1</p> <p>1</p> <p>2</p>
Tuesday	<p>Pelvic diaphragm. Pelvic floor, clinical observations. (L)</p> <p>Perineum. Episiotomy (types - anatomic correlations, significance, complications). (L)</p> <p>Pelvic fascia, fascial spaces in pelvis. Ischioanal fossa (anatomical basis of infection and complications. Pelvic position of peritoneum. Clinical observations. (P)</p> <p>Mid-Term exam (MCQ test) (P)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
Wednesday	<p>Anatomy review of the pelvic cavity. Review of female internal genital organ: the ovary (external morphology, position, relation to the peritoneum, the ovary attachments and supports, follicular maturation in the ovary, ovarian cysts); fallopian tube (parts and ostia, direction, fallopian tube peritonuem, clinical and anatomical aspect of ectopic pregnancy, hysterosalpingography, tubal ligation). (L)</p> <p>Overview of female internal genital organ: the uterus (external morphology, the uterine cavity, the uterine attachments and support, changes in uterine position, uterine prolapse, wall structure of uterus, cyclical changes in the endometrium, benign tumors of the uterus, cervical cancer, methods of detection and prevention of cancer). Endometriosis. Examination and diagnostics of female internal genital organ (bimanual palpation, ultrasound). Assisted reproductive technology. Levels of the uterus during pregnancy and postpartum involution. Age differences and malformations of the uterus.</p>	<p>1</p> <p>1</p> <p>2</p>

	<p>Anatomical basis of C-section. Hysterectomy and damage to the ureter; vagina (gross morphology, position and relations to the peritoneum, culdocentesis and culdoscopy; vaginal prolapse - vesicocele and rectocele; hymen (types, forensic significance); female external genital organs. Blood supply and lymphatic drainage of female sexual organs and its correlation with dissemination of malignant cells. Innervation. (L)</p> <p>Identifying the basic morphological characteristics of the female reproductive tract and its orientation. Clinical observations. (P)</p>	
Thursday	<p>Overview of male genital organ: testicle (gross anatomy, structure of the testis, spermatogenesis, descensus testis, cryptorchidism); epididymis; vas deferens (vasectomy); ejaculatory duct; seminal vesicle; prostate (clinical division of the prostate into zones, benign prostatic hypertrophy, prostate cancer, anatomical basis of digitorectal examination of the prostate); male urethra (parts of male urethra, curves in correlation of catheterization); penis (main characteristic and structure, erection and ejaculation; phimosis, circumcision); scrotum, cremasteric reflex. Blood supply, innervation and lymphatic drainage of male genital organs. Venous drainage and its importance in development of varicocele. (L)</p> <p>Anatomy review of the lower urinary tract: pelvic part of the ureter (main characteristic, ureteral constrictions in correlation of ureteral stones); bladder (gross anatomy, location of the bladder, attachments of the bladder, micturition and continence of the bladder, urinary retention, suprapubic aspiration, cystoscopy); female urethra. (L)</p> <p>Identifying the basic morphological characteristics of the male genital organs and organs of the lower urinary tract, orientation. Clinical observations. (P)</p>	<p>1</p> <p>1</p> <p>2</p>
Friday	<p>Anatomy review of the lower digestive tract: colon sigmoideum (gross anatomy, topography, variation in length and localization, volvulus, diverticulum, cancer, anatomical facts relevant to sigmoidoscopy, colonoscopy, colostomy); rectum (gross anatomy, topography and connection with the peritoneum, anal continence and defecation, rectal cancer, rectal injury, rectal examination). (L)</p> <p>Neurovascular structures of the pelvis: vasa iliaca interna; pelvic nerves (sacral plexus, coccygeal plexus, pelvic plexus). Pudendal nerve block, anatomical basis of nerve blockade. The lymph drainage of the pelvis. Medical imaging of the pelvis and pelvic organs. (L)</p> <p>Identifying the basic morphological characteristics of the lower digestive tract and its orientation. Case report. Clinical observations. (P)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

	Mid-Term exam (MCQ test) (P)	
Week 17-18.	Final exam (regular term)	
Week 18-19.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MSFE 0110	Course title: The Basics of Population Genetics in Medicine		
Level: preclinical	Study year: I	Semester: II	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturer:	Jasmin Mušanović, MSc, PhD, Belma Imamovic MSc, PhD		
1. Overall aim	Adoption of knowledge and skills in the field of population genetics in medicine, which is necessary for a successful medical studies..		
2. Course contents	<p>Through the teaching of the subject "The Basics of Population Genetics in Medicine" the student will adopt the following knowledge:</p> <p>Module 1. Terms in population genetics</p> <p>The aim of the module is to adopt and increase the knowledge about basic genetic concepts of population genetics and to increase students' knowledge of the practical and theoretical application of population genetics with an emphasis on the significance of medical research.</p> <p>Module 2. Mechanisms that disrupt the genetic equilibrium (balance) of the population</p> <p>The aim of the module is to explain mechanisms of gene mutations that cause changes in the frequency of alleles in the population and their impact on diversity within the population as well as mutagenic performance principles. Observe the possible effects of the mutation on the genetic balance through examples of hereditary diseases that occur when the genetic balance is disturbed.</p> <p>Module 3. Population Variability</p> <p>The goal of the module is to clearly understand the importance of preserving genetic variability in the population.</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge needed for analysing allele frequency and their application in medicine. They will be introduced to genetic markers, analysis of DNA profile and will be able to give basic advice after seeing the condition of allele frequency in human population.</p> <p><i>Through the lectures students will gain following knowledge and competences:</i></p> <ol style="list-style-type: none"> 1. Learn basics terms about Population genetics and better understanding of etiology of variety of illness 		

	<p>2. Discover mechanism that leads to mutation of genes and their effect on human population</p> <p>3. Understand the importance of genetical diversity in human population</p> <p><i>Through the practical works students will acquire following skills:</i></p> <ul style="list-style-type: none"> - analyze the allelic frequencies, - calculate allele frequencies in the population - determine whether the allele is the wild-type or mutant form - for genetic equilibrium and factor analysis, which is a disturbance of the disease and hereditary diseases, - learn about genetic markers, - analyze the DNA profile (polymorphisms, mutations), - learn how to give and provide basic genetic advice - phenotype properties of hereditary illness in population
4. Teaching methods	<p>Lectures: 8 hours</p> <p>Seminar: 2</p> <p>Practical work: 10 hours</p>
5. Method of knowledge assessment and examination	<p>There are two partial exams consisted</p> <p>Partial exam 1 consists of a theoretical and a practical part.</p> <p><u>On the first partial exam</u> a student can win a maximum of 50 and a minimum of 27,5 points.</p> <p>On the first partial exam from the practical part, a student can win a maximum of 20 and a minimum of 11 points.</p> <p>On the first theoretical part, a student can win a maximum of 30 points and a minimum of 16,5 points.</p> <p>Partial exam 2 consists of a practical and theoretical part.</p> <p><u>On the second partial exam</u>, a student can win a maximum of 50 and a minimum of 27, 5 points.</p> <p>On the second partial exam from the practical part, a student can win a maximum of 20 and a minimum of 11 points.</p> <p>On the theoretical part, a student can win a maximum of 30 points and a minimum of 16, 5 points.</p> <p>If the student did not meet the partial exam, he / she would take part in the final exam.</p>

	<p>Scoring (continuous assessment of knowledge) will be done by different methods of assessment (MCQ, essay, student activity, and if necessary oral examination but not mandatory).</p> <p>Formation of cumulative assessment</p> <table><tr><th>Rating</th><th>Number of points</th><th>Description Rating</th></tr><tr><td>10 (A)</td><td>95-100</td><td>remarkable success without mistakes or with minor errors</td></tr><tr><td>9 (B)</td><td>85-94</td><td>above average, with some mistakes</td></tr><tr><td>8 (C)</td><td>75-84</td><td>average, with subtle errors</td></tr><tr><td>7 (D)</td><td>65-74</td><td>generally good, but with significant shortcomings</td></tr><tr><td>6 (E)</td><td>55- 64</td><td>meets the minimum criteria</td></tr><tr><td>5 (F,FX)</td><td>< 55</td><td>does not meet the minimum criteria</td></tr></table>	Rating	Number of points	Description Rating	10 (A)	95-100	remarkable success without mistakes or with minor errors	9 (B)	85-94	above average, with some mistakes	8 (C)	75-84	average, with subtle errors	7 (D)	65-74	generally good, but with significant shortcomings	6 (E)	55- 64	meets the minimum criteria	5 (F,FX)	< 55	does not meet the minimum criteria
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7 (D)	65-74	generally good, but with significant shortcomings																				
6 (E)	55- 64	meets the minimum criteria																				
5 (F,FX)	< 55	does not meet the minimum criteria																				
6. Literature	<p>Obligatory:</p> <ul style="list-style-type: none">– Daniel HL, Maryellen R, Genetics: Analysis of Genes and Genomes. 8th Edition. USA. Jones & Bartlett Learning; 2012.– Bruce A, Alexander DJ, Julian L, David M, Martin R, Keith R, Peter Walter. Molecular Biology of THE CELL. 6th edition. USA. Garland Sciences; 2015. <p>Recommended:</p> <ul style="list-style-type: none">– Ricki L. Human Genetics- Concepts and Applications. 10th edition. USA. Mc Graw Hill; 2012.– HANDOUTS																					
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department’s notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department’s secretary or via e-mail: biologija@mf.unsa.ba</p>																					

COURSE PLAN: THE BASICS OF POPULATION GENETICS IN MEDICINE

Weeks	Forms of instruction and materials	Number of classes
Week 1.	Lecture: Historical development of population genetics, definition and explanation of population genetics	1
Week 2.	Lecture: Genetic markers, DNA molecule	1
Week 3.	Practice: Model of DNA molecule, sense and antisense strands of DNA molecule, gene, allelic variants of different populations	2
Week 4.	Lecture: Genetic markers	1
Week 5.	Lecture: Allele frequencies, the importance of knowing allele frequencies, DNA profile in population genetics.	1
Week 6.	Practice: DNA profile in the population analysis, the methods used to create a DNA profile	2
Week 7.	Lecture: The genetic diversity of the population, stable population, Hardy- Weinberg equilibrium, disequilibrium	1
Week 8.	<p>Lecture: Polymorphism and allelic frequencies, factors that disturb the Hardy-Weinberg principle, the nonrandom mating, inbreeding, outbreeding, mutations, genetic drift, migration, natural selection, isolation</p> <p>Practice: DNA profile (DNA profile –showing polymorphisms in the DNA profile, the importance of polymorphisms, showing mutations in the DNA profile, the impact of mutation to the allelic frequency and balance of the population)</p>	1 1
Week 9.	Mid-term exam 1 (Partial exam 1)	1
Week 10.	Lecture: The bottleneck in population genetics, effects on the population	1
Week 11.	Lecture: Hereditary diseases that occur in isolated and local populations	1

Week 12.	Practice: The analysis of allele frequencies in heterogeneous populations – a comparative analysis	2
Week 13.	Seminar: Genetic consequences of isolation of human populations	1
Week 14.	Practice: The analysis of allele frequencies in a small local and isolated populations – a comparative Seminar: Benefit of genetic variability of human populations	1 1
Week 15.	Mid-term exam 2 (Partial exam 2)	1
Weeks 17-18.	Final exam (regular term)	
Weeks 19-20	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0111	Course title: Applied Anatomy of the Cardiovascular System		
Level: preclinical	Study year: I	Semester: I	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturers:	Professor Aida Hasanović MD PhD		
1. Overall aim	<p>The overall aim of the <i>Applied anatomy of the cardiovascular system</i> course is to help students understand the basic sciences that underlie the practice of cardiovascular medicine. An understanding of the anatomy of the heart and great vessels is vital to the practice of cardiology.</p> <p>The module will prepare students for future work in the medical course that will include learning in relation to the assessment and promotion cardiovascular health and management of a range of cardiovascular disease.</p>		
2. Course contents	<p>The following topics will be covered during the Modules:</p> <p>Module 1. Applied anatomy of the heart</p> <p>Module 2. Applied anatomy of the great vessels</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge necessary for understanding the relevance and importance of the anatomy of the heart and great vessels to future work as doctors. The course reviews important topics in cardiovascular anatomy that pertain to the practice of clinical cardiology.</p> <p>This course covers the following components of cardiac anatomy: structure of the heart and the great vessels, congenital heart diseases, structure and function of the conduction cardiac system, cardiac cycle, blood pressure and blood flow to organs, coronary circulation in health and disease, the major cardiovascular disease.</p> <p>The course will also introduce the foundations for identifying different anatomical structures through image analysis to allow students to integrate anatomical knowledge into the principal radiological exploration for clinical diagnosis.</p> <p>Through the course of <i>Applied anatomy of the cardiovascular system</i> the students will gain following knowledge and competences:</p> <ol style="list-style-type: none"> 1. Explain the normal structure and function of the cardiovascular system by learning and applying the relevant basic sciences. 2. Apply the above knowledge to a few common real life situations (Hypertension, Myocardial infarction, Shock) to explain how the anatomy, physiology are altered in the given situations. 3. Explain the normal cardiac cycle by using knowledge of the normal structure of the heart, including its musculature, coverings, nerve supply and conducting system of the heart, generation of normal heart sounds as well as murmurs. 4. Explain blood pressure and blood flow to various organs by using knowledge of the normal structure of blood vessels, haemodynamics of circulation and blood pressure in health and disease. 5. Explain the development and effects of coronary arterial disease by using knowledge of the coronary blood flow and development and effects of 		

	<p>atherosclerosis.</p> <p>6. Describe the development of congenital heart defects.</p> <p>Through the practical work students will acquire following skills:</p> <ul style="list-style-type: none"> - Recognise studied structures of the heart and great vessels in a cadaver, according to shape and topography, and relate this to knowledge gained from image analysis techniques . Imaging anatomy: radiographs, CT, MRI, ultrasound images, coronary angiography - Recognise the major structured of the heart and mediastinum on CT images at two transverse levels in the thorax - Point out the main features of the heart and great vessels in chest radiographs - Describe the blood supply of the heart and clinical significance - Physical examination of the cardiovascular system Auscultation of the heart, examination of arterial and venous pulses - Recognize a basic cardiovascular history.
4.Teaching methods	<p>Lectures: 10 hours</p> <p>Practical work : 10 hours</p>
5. Method of knowledge assessment and examination	<p>-Written tests in the form of Multiple choice questions (MCQ) tests</p> <p>- Continous knowledge and skills assessment will be carried out through</p> <p>Practical work</p>
Literature	<p>Recommended:</p> <p>1.Murphy JG. Applied anatomy of the heart and the great vessels. In JG Murphy (Ed.), Mayo Clinic cardiology review. 2nd ed., pp 927-960 Philadelphia: Lippincott Williams & Wilkins, 2000.</p> <p>2. Moore KL, Dalley AF. Clinically oriented anatomy. 5th ed. Lippincott Williams &Wilkins, 1999.</p> <p>3. Drake RL, Vogl W, Mitchell AWM. Gray's Anatomy for Students. Elsevier Churchill Livingstone, 2005.</p> <p>4. Waschke J, Paulsen F. Sobotta Atlas of Human Anatomy. 15th ed. Elsavier, 2012.</p> <p>Additional literature for Bosnian students:</p> <p>1. Hasanović A. Anatomija unutrašnjih organa. Institut za naučno istraživački razvoj Kliničkog centra Univerziteta u Sarajevu. Sarajevo, 2011.</p>
7.Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN: APPLIED ANATOMY OF THE CARDIOVASCULAR SYSTEM

Day	Teaching methods and materials	Number of hours
Monday	<p>Lecture: Normal structure and function of the cardiovascular system by learning and applying the relevant basic sciences. Congenital abnormalities of the heart and great vessels- anatomical and clinical importance.</p> <p>Practical work: Recognise studied structures of the heart and great vessels in a cadaver, according to shape and topography, and relate this to knowledge gained from image analysis techniques. Imaging anatomy: radiographs, CT, MRI, ultrasound images Congenital heart diseases. The fetal circulation.</p>	<p>2</p> <p>2</p>
Tuesday	<p>Lecture: Structure and function of the conduction cardiac system. Cardiac cycle.</p> <p>Practical work: Explain the normal cardiac cycle by using knowledge of the normal structure of the heart, including the musculature, covering. Recognise the major structured of the heart and mediastinum on CT images at two transverse levels in the thorax. Nerve supply and conduction system of the heart, generation of normal heart sounds as well as murmurs.</p>	<p>2</p> <p>2</p>
Wednesday	<p>Lecture: Blood pressure and blood flow to organs. Coronary circulation in health and disease. Hypertension, Shock, Myocardial infarction-how the anatomy, physiology are altered in given situation.</p> <p>Practical work: Explain blood pressure and blood flow to various organs by using knowledge of the normal structure of blood vessels, haemodynamics of circulation and blood pressure in health and disease.</p> <p>Partial exam 1</p>	<p>2</p> <p>2</p>
Thursday	<p>Lecture: The major cardiovascular disease. Atherosclerosis as a risk factor for coronary insufficiency. Anatomic variations of the coronary arteries. Anastomoses.</p> <p>Practical work: Describe the development and effects of coronary artery disease by using knowledge of the coronary blood flow and development and effects of atherosclerosis. Methods in the diagnosis of ischemic heart disease-coronary angiography, echocardiography, myocardial perfusion scintigraphy</p>	<p>2</p> <p>2</p>
Friday	<p>Lecture: Ischemic heart disease. Importance of collateral circulation of the heart. Aortic aneurysm.</p> <p>Practical work: Physical examination of the cardiovascular system. Auscultation of the heart, examination of arterial and venous pulses. Recognize a basic cardiovascular history.</p> <p>Partial exam 2</p>	<p>2</p> <p>2</p>
Week 17-18	Final exam (regular term)	
Week 19-20	Final exam (make-up examination term)	
September	Final exam (September term)	

FIRST YEAR

SECOND SEMESTER (SUMMER)						
Code	Course title	L	P	S	TCH	ECTS
MFSE 0201	Human Anatomy 2	45	55		100	10
MFSE 0202	Neuroanatomy	20	20		40	3
MFSE 0203	Medical Chemistry and Medical Biochemistry 1	54	46		100	8
MFSE 0204	Fundamentals of Clinical Practice/Skills	10	20		30	2
MFSE 0205	Introduction to Scientific Methods 1	15	15		30	2
MFSE 0206	Social Medicine and Organization of Health Care 1	20	20		40	2
MFSE 0207	Bosnian Language 2	15	15		30	2
MFSE 0208-0211	Elective course	10	10		20	1
	TOTAL	189	201		390	30

Elective Courses:

MFSE 0208 Anatomical Basis of Peripheral Nerve Lesions

MFSE 0209 Clinical Anatomy of the Internal Organs

MFSE 0210 Health Education

MFSE 0211 Selected Instrumental Methods of Chemical Analysis in Medical Practice

Code: MFSE 0201		Course title: Human Anatomy 2	
Level: preclinical	Study year: I	Semester: II	ECTS: 10
Status: obligatory	Total contact hours: 100		
Prerequisites:	According to the Study Regulation		
Lecturers: Prof. dr Aida Hasanović, Assos. Prof. dr Eldan Kapur, Assos. Prof. dr Aida Sarač-Hadžihalilović, Assos. Prof. dr Ilvana Hasanbegović, Assos. Prof. dr Alma Voljevica, Assos. Prof. dr. Almira Lujinović, Assis. Prof. dr Elvira Talović, Ass. dr Lejla Dervišević, Ass. dr Zurifa Ajanović			
1. Overall aim	The overall aim of Human Anatomy 2 is that through studying Topographic anatomy students can learn anatomy based on regions, emphasizing the relations among certain structures (muscles, nerves, arteries...) in specific region.		
2. Course contents	The following topics will be covered during the Modules: Module 1. Topographic anatomy of the head and neck Module 2. Aesthesiologia Module 3. Topographic anatomy of the thorax and upper extremity Module 4. Topographic anatomy of abdomen, pelvis and lower extremity		
3. Learning outcomes (Knowledge, skills and competences)	Students will acquire thoroughly knowledge of topographical anatomy which is crucial for understanding function and pathological changes in human body. Studying the anatomy by the regions students will be able to apply their knowledge and skills in clinical settings (diagnostic and therapeutic medicine). Through practical work the students will reinforce basic anatomy knowledge by observing human body as unique morphological unit. Students will grasp the relation between anatomy and other basic medical and clinical disciplines. <i>Through the lectures and practical work, the students will gain following knowledge and competences:</i> <ol style="list-style-type: none">1. Acquire knowledge about head and neck region in general, muscles, blood vessels, lymphatic and nerve supply of specific region. Gain knowledge about topographical region of the head and neck as well as projections and relations of the head and neck organs.2. Acquire knowledge about morphology and topography of the sense organs.3. Acquire knowledge about thoracic wall, its content, sitopic, sceletotopic and holotpic relations of organs in thoracic cavity, blood vessels and nerves in thoracic cavity, as well as knowledge about blood vessels, nerves, lymphatic and musculature of upper extremity.4. Gain knowledge about abdomen and pelvis wall, it's content, sintopic, sceletotopic and holotopic relations of organs in abdomino-pelvic cavity. Acquire knowledge about peritoneal, retroperitoneal and extraperitoneal spatia, as well as knowledge about blood vessels, nerves, lymphatic and musculature of lower		

	<p>extremity.</p> <p><i>Through the practical work students will acquire following skills:</i></p> <ol style="list-style-type: none"> 1. Recognition of muscles, blood vessels and lymphatic and nerves supply of the specific region of the head and neck. 2. Recognition of topographical region of the head and neck, projection and relations of the organs of the head and neck. 3. Recognition of morphology and topography of the sense organs. 4. Identification of the thoracic wall structures. 5. Content, sintopic, sceletotopic and holotopic relations of the organs in thoracic cavity. 6. Recognition of blood vessels and nerves in thoracic cavity, as well as recognition of blood vessels, nerves, lymphatic and muscles of upper extremity. 7. Identification of the abdomino-pelvic wall structures. 8. Content, sitopic, sceletotopic and holotopic relations of organs in abdomino-pelvic cavity. 9. Identification of blood vessels, nerves, lymphatic and muscles of lower extremity. 10. Dissection of topographical regions of human body on cadaver. 11. Orientation on horizontal, frontal and sagittal planes in all levels of human body. 12. Practical orientation of internal organs on anatomical models.
4. Teaching methods	<ul style="list-style-type: none"> - Lectures: 45 hours - Practical work: 55 hours
5. Method of knowledge assessment and examination	<ul style="list-style-type: none"> - Written test in the form of Multiple Choice Question (MCQ) test - Continuous knowledge and skills assessment will be carried out through Partial exams - Final exam: knowledge assessment of the module or modules that has not been positively evaluated in Partial exams
6. Literature	<p>Recommended</p> <ul style="list-style-type: none"> - Drake RL, Vogl W, Mitchell AWM. Gray's Anatomy for Students. Elsevier Churchill Livingstone. 2005. - J. Waschke, F. Paulsen Sobotta Atlas of Human Anatomy, 15th Edition. Elsevier, 2012
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN: HUMAN ANATOMY 2

Day	Method of teaching and materials	Number of hours
Day 1.	<p>Lecture: Muscles-Overview. Anterior topographic regions of the neck (overview). Overview of vascularization, innervation and lymphatics of the neck. The system of external and internal carotid artery.</p> <p>Practical work: Lateral and media cervical region (borders of the regions, muscles, blood vessels and nervous elements). Submandibular region and carotid region (borders of the regions, muscles, blood vessels and nervous elements).</p>	<p>2</p> <p>3</p>
Day 2.	<p>Lecture: Projections and approaches to the pharynx, larynx and cervical part of the trachea. Spatium retropharyngeum, spatium parapharyngeum. Topographic regions of the head (overview).</p> <p>Practical work: Anterior topographic regions of the head–Facial region (parotid region, buccal region, oral region) - borders of the regions, muscles, blood vessels and nervous elements.</p>	<p>2</p> <p>3</p>
Day 3.	<p>Lecture: Temporal fossa, infratemporal fossa, pterygopalatine fossa (content and communications). Blood vessels, nerves and lymphatics of the head.</p> <p>Practical work: Nasal region, infra – orbital region (borders of the regions, muscles, blood vessels and nervous elements).</p>	<p>2</p> <p>3</p>
Day 4.	<p>Lecture: Review of the cranial nerves with a special focus on the anatomic distribution and region of innervation.</p> <p>Practical work: Orbital region, frontal region (borders of the regions, muscles, blood vessels and nervous elements).</p>	<p>2</p> <p>3</p>
Day 5.	<p>Lecture: Functional and applied anatomy of the nerves of the head and neck. Posterior topographic regions of the head and neck</p> <p>Practical work: Temporal region, retromandibular region (borders of the regions, muscles, blood vessels and nervous elements).</p>	<p>2</p> <p>3</p>
Day 6.	<p>Lecture: Vertebrobasilar system Applied anatomy of the blood vessels of the head and neck with a special focus on intracranial and extracranial anastomosis.</p> <p>Practical work: Auricular region, occipital region (borders of the regions, muscles, blood vessels and nervous elements) Posterior cervical region, nuchal region.Epicranium.</p>	<p>2</p> <p>3</p>
Day 7.	<p>Lecture: Organum visus.</p> <p>Practical work: Organum visus (eyeball, layers of the eyeball, dioptric apparatus of the eye).</p>	<p>2</p> <p>3</p>
Day 8.	<p>Lecture: The principles of organization of the visual system. Organum vestibulocochlearis.</p> <p>Practical work: Accessory visual structures. External ear, middle ear(tympanic cavity, mastoid antrum).</p>	<p>2</p> <p>3</p>
Day 9.	<p>Lecture: Organum vestibulocochlearis. Topographic relations of the external, middle and internal ear and their clinical significance, static and acoustic pathway.</p> <p>Practical work: Internal ear (bony labyrinth, membranous labyrinth).</p>	<p>2</p> <p>3</p>

Day 10.	I PARTIAL EXAM (MCQ test) Lecture: Topographic region of the anterior and lateral thoracic wall. Breasts (position, structure, vascularization, innervation and lymphatics of the breast). Clinical and anatomical importance. Practical work: Infraclavicular region, pectoral regio (muscles of the anterior aspect of the thoracic wall, intercostal space, blood and lymph vessels and nerves).	2 3
Day 11.	Lecture: Anterior topographic regions of the upper limb (Overview). Clinically important topographical relation of the elements in the certain regions of the upper limb. Practical work: Axilla, anterior aspect of arm, cubital fossa, anterior aspect of forearm, anterior aspect of hand (borders of the regions, muscles, blood vessels and nervous elements).	3 3
Day 12.	Lecture: Topographic division of the thoracic cavity. Overview of mediastinum. Projections of the organs on anterior thoracic wall. Practical work: Descriptive anatomy of the elements of the thoracic cavity (ascending aorta, aortic arch and thoracic aorta, superior vena cava). Diaphragm. Section anatomy of the chest. Overview of organs of the thoracic cavity and their topographical relationships.	2 3
Day 13.	Lecture: Projections of the organs on posterior thoracic wall. Topographic anatomy of posterior thoracic wall. Practical work: Descriptive anatomy of the elements of the thoracic cavity (internal thoracic artery, right lymphatic duct, thoracic duct, sympathetic trunk, splanchnic nerve).	2 3
Day 14.	Lecture: Topographic anatomy of posterior thoracic wall. Posterior topographic regions of the upper limb (Overview). Practical work: Suprascapular region, Scapular region, posterior aspect of arm, posterior cubital region, posterior aspect of forearm, posterior aspect of hand (borders of the regions, muscles, blood vessels and nervous elements)	3 3
Day 15.	II PARTIAL EXAM (MCQ test) Lecture: Topographic region of anterolateral abdominal wall Muscles, fascia and aponeurosis of anterolateral abdominal wall. Inguinal canal. Anterior topographic regions of the lower limb (Overview). Practical work: Hypochondriac region, Epigastric region, Abdominal region, Umbilical region, Inguinal region, pubic region (borders of the regions, muscles, blood vessels and nervous elements). Subinguinal region, anterior femoral region, reg. genus anterior (borders of the regions, muscles, blood vessels and nervous elements)	3 3
Day 16.	Lecture: Clinically important topographical relation of the elements in the certain regions of the lower limb. Topographic division of the abdominal cavity. Practical work: Anterior crural region, Medial and lateral retromalleolar region, dorsum of foot (borders of the regions, muscles, blood vessels and nervous elements). Descriptive anatomy of elements of the abdominal cavity (abdominal	3 3

	aorta, inferior vena cava, portal vein, portocaval anastomosis, coeliac plexus).	
Day 17.	Lecture: Peritoneum (subdivisions and overview) Projections of the organs on abdominal wall. Practical work: Section anatomy of the abdominal cavity Abdominal lymphatics, coeliac plexus.	3 3
Day 18.	Lecture: Topographic anatomy of the pelvis. Floor of the pelvic cavity. Practical work: Perineal region, Anal region, Urogenital region. Internal iliac vessels and branches, hypogastric plexus. Lymph nodes of pelvis	3 2
Day 19.	Lecture: Topographic regions of the back. (Overview). Overview of the muscular, vascular and nervous elements. Posterior topographic regions of the lower limb. Practical work: Lumbal region, gluteal region, posterior femoral region, popliteal fossa, posterior crural region, plantar aspect of foot (borders of the regions, muscles, blood vessels and nervous element.	3 2
Day 20.	III PARTIAL EXAM (MCQ test)	
Week 17-18.	Final exam (regular term)	
Week 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0202	NEUROANATOMY		
Level: preclinical	Study year: I	Semester: II	ECTS: 3
Status: obligatory	Total contact hours: 40		
Prerequisites:	According to the Study Regulation		
Lecturers: Assos. Prof. dr Eldan Kapur Prof. dr Aida Hasanović, Assos. Prof. dr Aida Sarač-Hadžihalilović, Assos. Prof. dr Ilvana Hasanbegović, Assos. Prof. dr Alma Voljevica, Assos. Prof. dr. Almira Lujinović, Assis. Prof. dr Elvira Talović, Ass. dr Lejla Dervišević, Ass. dr Zurifa Ajanović			
1. Overall aim	Neuroanatomy is a part of systemic anatomy that deals with the study of the morphology of the nervous system with emphasis on the anatomical basis of the mechanisms for achieving its role as the main management and control systems of the body. The aim of the course "Neuroanatomy" is the acquisition of knowledge about the organization and structure of the human central, peripheral and autonomic nervous system.		
2. Course contents	<p>The following topics will be covered during the Modules:</p> <p>Module 1. Classification of the nervous system. Spinal cord. Brainstem. Cerebellum.</p> <p>Module 2. Diencephalon. Telencephalon. Autonomic nervous system.</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge of the central and peripheral nervous system is essential for many diagnostic and therapeutic procedures in many areas of medicine. The purpose of the course is to examine thoroughly the organization and structure of the nervous system, both in theoretical and practical terms, the analysis of macroscopic cross-section of organs of the central nervous system. In addition, the purpose of the course "Neuroanatomy" is to acquire basic knowledge about the normal structure of our nervous system to the extent necessary scope for further successful study monitoring.</p> <p><i>Through the lectures and practical work, the students will gain following knowledge and competences:</i></p> <ol style="list-style-type: none">1. To clarify the division, the basic elements of the structure and terms used in the description of the nervous system. Understanding the development of brain. Describe the external structure of the spinal cord as a whole and in cross section. Explain the function of the gray and white matter of the spinal cord. Classify brainstem. To enumerate the parts of the brain stem and describe the structure. Connect the morphology and function of the gray mass of the brain stem. Divide the peripheral nervous system. Classify the cranial and spinal nerves. Explain the formation of the nervous junctions and their function. Describe the external morphology and internal structure of the cerebellum. Explain the neural circles of the cerebellum.2. To explain division of the diencephalon. Describe parts of the diencephalon. Categorize the gray matter of the diencephalon and		

	<p>explain their function. Understanding connections between hypothalamus and pituitary gland using the portal system and neurosecretory. Describe derivatives of telencephalon. Explain the structure and function of the cerebral cortex. To distinguish sulci and gyri of the cerebrum. Connect cerebral cortex with its function. Define parts of cortex belonging to the limbic system. Explain the role of the limbic lobe. Describe the lateral ventricle. Define the concept of nerve pathway. Describe the non-specific sensory pathways. Describe and classify specific sensory pathways. Explain the mode of action of the pyramidal and extrapyramidal system. Determine the role of the reticular formation. Describe the blood vessels that supply the central nervous system. Define division of the meninges. Describe the meninges.</p> <p><i>Through the practical work students will acquire following skills:</i></p> <ol style="list-style-type: none"> 1. Recognition the macroscopic structure of the brain. 2. Recognition the brain structure on different section of the central nervous system (axial, coronar and sagittal). 3. Analysis of radiological images of central nervous system (CT, MRI).
4. Teaching methods	<ul style="list-style-type: none"> - Lectures: 20 hours - Practical work: 20 hours
5. Method of knowledge assessment and examination	<ul style="list-style-type: none"> - Written test in the form of Multiple choice questions (MSQ) - Oral examination - Continuous knowledge and skills assessment will be carried out through MSQ test.
6. Literature	<p>Recommended</p> <ul style="list-style-type: none"> - Haines DE. Neuroanatomy an Atlas of Structures, Sections and Systems. Eight edition, USA: Lippincot Williams & Wilkins; 2012. - Puttz R. Sobotta Atlas of Human Anatomy. 15th edition, USA: Elsevier; 2012.
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN OF NEUROANATOMY

Day	Method of teaching and materials	Number of hours
Day 1.	<p>Lecture: The division of the nervous system. General terms. Orientation in the central nervous system. Elements of the nervous system (neurons, glia, synapse, nerves, ganglions). Development of the central nervous system. Functional and applied anatomy of the spinal cord and spinal nerves; Dermatomes, sklerotomes and miotomes.</p> <p>Practical work: The spinal cord (external features, organization of grey and white substance); Cross sections of the spinal cord; Spinal nerves; plexus of the spinal nerves-review.</p>	<p>3</p> <p>3</p>
Day 2.	<p>Lecture: Brainstem, location and parts; Medulla oblongata, pons, midbrain, (external features, organization of gray and white substance); Nucleus of the cranial nerves. Cranial nerves, background and detailed description of nuclei in the brainstem, the origin, distribution and clinical and anatomical importance.</p> <p>Practical work: Medulla oblongata, pons, midbrain, (external features, internal structure, sections); Relay nucleus of brainstem and their importance. Review openings and topographic region of the head, neck and trunk of importance for the origin, peripheral flow and distribution of the cranial nerves.</p>	<p>3</p> <p>3</p>
Day 3.	<p>Lecture: Functional anatomy and neural circuits of the cerebellum. Diencephalon, position and division; Thalamus, external and internal features. Epithalamus, epiphysis cerebri, metathalamus, subthalamus, hypothalamus – external features and internal structure); third ventricle.</p> <p>Practical work: Review openings and topographic region of the head, neck and trunk of importance for the origin, peripheral flow and distribution of the cranial nerves. Cerebellum, (position, external features, anatomical, functional and phylogenetic division, structure of the cerebellum, fourth ventricle)</p> <p>PARTIAL EXAM 1</p>	<p>3</p> <p>2</p>
Day 4.	<p>Lecture: Epithalamus, epiphysis cerebri, metathalamus, subthalamus, hypothalamus – external features and internal structure); third ventricle. Functional and applied anatomy of the hypothalamic-pituitary axis; portal blood circulation of the hypophysis; neurosecretion. Telencephalon, position, division and external features. Lateral ventricle.</p> <p>Practical work: Analysis of the relationship parts of diencephalon; the external features; third ventricle, the walls and communications.</p>	<p>3</p> <p>3</p>
Day 5.	<p>Lecture: Telencephalon, position, division and external features. Lateral ventricle. Organization of the gray and white substance of the brain; Functional and anatomical distribution of the cerebral cortex and its importance.</p>	<p>3</p>

	<p>Basal substance; functional anatomy of the limbic system.</p> <p>Practical work: Lobes, sulci and gyri of the cerebrum, parts, walls and communications of the lateral ventricle.</p> <p>White substance of the telencephalon. Capsules and commissures of the telencephalon. Association fibers of telencephalon.</p>	3
Day 6.	<p>Lecture: Review of the central nervous system tracts. The definition of the upper and lower motor neurons. Peripheral, central and cortical neurons of non-specific and specific sensory tracts.</p> <p>Vascularization of the central nervous system and its clinical-anatomical importance.</p> <p>Practical work; White substance of the telencephalon. Capsules and commissures of the telencephalon. Association fibres of telencephalon.</p> <p>Corticospinal and corticobulbar tracts; extrapyramidal motor tracts; tracts of nonspecific sensitivity (spinothalamic tract, medial and trigeminal lemniscus). Specific sensitive tracts.</p> <p>Horizontal, frontal and sagittal sections of the brain, method of review, CT, MR.</p>	3 3
Day 7.	<p>Lecture: Meninges and cerebrospinal fluid.</p> <p>The autonomic nervous system; division and principles of the organization. Autonomic innervation of internal organs.</p> <p>Practical work: The internal carotid and vertebrobasilar system, superficial and deep veins of the brain, sinuses of the cranial dura mater, meninges, cerebrospinal fluid, ventricular system.</p> <p>Topography of intracranial space and extracranial projections structures of the brain.</p> <p>PARTIAL EXAM 2</p>	3 2
Week 17-18.	Final exam (regular term)	
Week 19.-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0203		Course title: Medical Chemistry and Medical Biochemistry 1	
Level: preclinical	Study year: I	Semester: II	ECTS: 8
Status: obligatory	Total contact hours: 100		
Prerequisites:	According to the Study regulation		
Lecturers: Associate Professor Amira Čopra-Janićijević, PhD, Associate Professor Radivoj Jadrić MD PhD, Associate Professor Sabaheta Hasić MD PhD, Associate Professor Emina Kiseljaković MD PhD, Assistant Professor Lejla Klepo PhD, Assistant Lejla Alić MD, Assistant Amila Kulo MD			
1. Course aims	The overall aim of Medical Chemistry and Medical Biochemistry 1 Course is to increase understanding of chemical structures and biochemical function of biomolecules, as well as biochemical energetic changes that occur in the body of a healthy human.		
2. Course contents	<p>The following topics will be covered within the Modules:</p> <p>Module 1. Physical and chemical processes in biological systems (MCM1) Aim: To acquire knowledge of basic principles and laws of physical chemistry</p> <p>Module 2. The structure and properties of organic biomolecules (MCM2) Aim: To acquire knowledge of chemical structure of organic biomolecules and their roles in cellular structures and processes.</p> <p>Module 3. The importance of inorganic and organic biomolecules of human body (MBM3) Aim: To acquire knowledge of the importance of inorganic and organic molecules in structures and functions in human organism.</p> <p>Module 4. Generation, utilization and storage of metabolic energy in human body (MBM4) Aim: To acquire knowledge of the processes of human body at the molecular level: kinetics of biochemical reactions and its application on biological systems; the ways of energy production and consumption; thermodynamic interactions in metabolism of physiological and pathological conditions.</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p><i>Through the lectures the students will gain following knowledge and competences:</i></p> <ul style="list-style-type: none">– To understand basic physical and chemical principles, metabolic processes and their regulation in the body of a healthy human– To learn basic principles of physical chemistry– To understand chemical structure of organic biomolecules and their		

	<p>direct influence on the structure of cells and chemical processes in the cell.</p> <ul style="list-style-type: none"> – To understand the importance of inorganic and organic molecules in the structure and function of the human body – To understand the processes of human body at the molecular level – kinetics of biochemical reactions and its application on biological systems; the ways of energy production and consumption; thermodynamic interactions in metabolism of physiological and pathological conditions. <p><i>Through the practical laboratory work students will acquire following skills:</i></p> <ul style="list-style-type: none"> – Work in chemical/biochemical laboratory (work with laboratory dishes, chemicals, and human biological material, precautions in the laboratory and first aid) – Measurement and calculations (pipetting, preparation of solutions, defining their concentration, preparation of physiological solutions, precise measurements, stoichiometric computations, SI) – Qualitative and quantitative analysis (identification and determination of organic biomolecules, determination of body fluid composition) – Spectroscopy and chromatography in separation, identification and determination of biogenic substances (UV/VIS spectrophotometry, paper and planar chromatography, electrophoresis)
4. Teaching methods	<p>Lectures: 54 hours (30 hours' Medical chemistry + 24 hours' Medical biochemistry 1)</p> <p>Laboratory practical work: 46 hours (25 hours Medical chemistry + 21 hours Medical biochemistry 1)</p>
5. Method of knowledge assessment and examination	<p>Continuous assessment of knowledge (Midterm examination) will be carried out through practical exams (colloquiums) and partial exams. During any form of knowledge assessment, the student will attain certain number of points with an obligatory minimum of 55% to pass the test successfully. Written test consists of Multiple choice question (MCQ) and/or Extended response questions (ERQ).</p> <p>Practical exam (colloquium)</p> <p>Continuous knowledge assessment will be carried out with two colloquiums.</p> <ul style="list-style-type: none"> – Colloquium 1 – Medical chemistry – Colloquium 2 – Medical biochemistry 1 <p>Colloquium 1</p> <p>After successful completion of practical work (attendance, practical work</p>

	<p>preparation, completion and verification), student is eligible to take a written test which comprises Medical chemistry topics in a form of:</p> <ul style="list-style-type: none"> – 12 MCQ (0.5 points each) = 6,0 points total – 7 problems in a form of chemical reactions and expressions (1 point each) = 7 points total – 4 stoichiometric calculations (3 points each) = 12 points total <p>Maximal score attained in colloquium 1 is 25 and minimum 14.</p> <p><i>Colloquium 2</i></p> <p>After successful completion of practical work (attendance, practical work preparation, completion and verification), student is eligible to take a written test which comprises Medical biochemistry 1 topics in a form of:</p> <ul style="list-style-type: none"> – 18 MCQ (1 point each) = 18 points total – 2 ERQ (1,5 points each) = 3 points total <p>Maximal score attained in colloquium 2 is 21 and minimum 11,5. Colloquium 1 is not an obligatory prerequisite for colloquium 2 and vice versa.</p> <p>Partial exam</p> <p><i>Partial exam 1</i></p> <p>Partial exam 1 comprises topics of Medical chemistry (modules 1 and 2) in the form of a written test:</p> <ul style="list-style-type: none"> – 20 MCQ (0,5 points each) = 10 points total – 8 ERQ (1 point each) = 8 points total – 4 ERQ (3 points each) = 12 points total <p>Maximal score attained in Partial exam 1 is 30 and minimum 16,5.</p> <p><i>Partial exam 2</i></p> <p>Partial exam 1 comprises topics of Medical biochemistry (modules 3 and 4) in the form of a written test:</p> <ul style="list-style-type: none"> – 40 MCQ (0,6 points each) = 24 points total <p>Maximal score attained in Partial exam 2 is 24 and minimum 13.</p> <p>Students who have successfully accomplished all of their obligations during the semester (attendance is within the legal limits) and who have passed all the necessary exams of the course (attained minimum score of 55% in partial exams 1 and 2 and colloquiums 1 and 2) are not required to take Regular exam. Their final grade is reported according to points</p>
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	<p>attained during Continuous knowledge assessment.</p> <p>Regular examination term Student is obliged to take regular exam if minimum points are not attained during midterm exams for both practical and theoretical parts of the course. Regular exam should be taken also if a student is not satisfied with the grade received on the midterm examination. Previously defined criteria for Midterm examination will be applied to Regular examination term (form of tests, number of question and points).</p> <p>None of the parts is prerequisite for other parts of the course. All of the tests can be taken independently.</p> <p>Re-sit examination term /September examination term Previously defined criteria will also be applied to Re-sit and September examination terms.</p> <p>Grading system and grading points Final grade is reported according to points attained during all forms of the knowledge assessment (practical and theoretical exams).3</p> <table><tr><th>Grade</th><th>Total score (points)</th><th>Grade description</th></tr><tr><td>10 (A)</td><td>95-100</td><td>Outstanding results without errors or with minor errors</td></tr><tr><td>9 (B)</td><td>85-94</td><td>Above average, with some mistakes</td></tr><tr><td>8 (C)</td><td>75-84</td><td>Average, with noticeable mistakes</td></tr><tr><td>7 (D)</td><td>65-74</td><td>Generally good, but with significant mistakes</td></tr><tr><td>6 (E)</td><td>55-64</td><td>Meets the minimum criteria</td></tr><tr><td>5 (F, FX)</td><td><55</td><td>Does not meet the minimum criteria</td></tr></table>	Grade	Total score (points)	Grade description	10 (A)	95-100	Outstanding results without errors or with minor errors	9 (B)	85-94	Above average, with some mistakes	8 (C)	75-84	Average, with noticeable mistakes	7 (D)	65-74	Generally good, but with significant mistakes	6 (E)	55-64	Meets the minimum criteria	5 (F, FX)	<55	Does not meet the minimum criteria
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5 (F, FX)	<55	Does not meet the minimum criteria																				
6. Literature	<p>Required:</p> <ul style="list-style-type: none">– Jadrić R, Hasić S, Kiseljaković E, Kulo A. Experimental Procedures and Clinical Correlations in Medical Biochemistry 1. Sarajevo: Perfecta; 2018– Skoog DA, West DM, Holler FJ, Crouch SR, Fundamentals of Analytical Chemistry. 9th ed. Cengage Learning; 2013.– Murray RF, Botham KM, Kennelly PJ, Rodwell VW: Harper's Illustrated Biochemistry. 28th ed. The McGraw-Hill Companies, Inc; 2009– Smith C, Marks AD, Lieberman M. Marks' Basic Medical Biochemistry-A Clinical Approach. 4th ed. Lippincott Williams &																					

	<p>Wilkins; 2013</p> <p>Recommended:</p> <ul style="list-style-type: none"> – Gareth T. Medicinal Chemistry-An Introduction. 2nd ed. Wiley; 2007 – Kroschwitz JJ, Winkour M. Chemistry. 2nd ed. Mc Graw-Hill, Inc; 1990.
7. Remarks	<p>All forms of lectures and practical laboratory work are mandatory. Student attendance is regulated by the Law of Higher Education of Sarajevo Canton. Student absence should be justified by valid documentation. Lectures and laboratory practical work will be held at the Department of Medical Chemistry and the Department of Medical Biochemistry</p> <p>Departments:</p> <ul style="list-style-type: none"> - Department of Medical Chemistry - Department of Medical Biochemistry <p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: biohemija@mf.unsa.ba</p> <ul style="list-style-type: none"> - Consultation: each working day: 1-2 p.m. at the Department of Medical Biochemistry or via e-mail radivoj.jadric@mf.unsa.ba

COURSE PLAN: MEDICAL CHEMISTRY AND MEDICAL BIOCHEMISTRY 1

Week	Teaching method and topics	Hours
Week one		
Day 1	Lecture: <ul style="list-style-type: none"> – The molecular basis of living systems – Chemical bonds in biomolecules – Intermolecular interactions in biological systems and their importance in maintaining the structure and interaction of biological macromolecules 	3
	Practical laboratory work: <ul style="list-style-type: none"> – Laboratory instructions and safety. Calculations. Laboratory first aid. Preparation of solutions and dilutions. Quantitative expression of solution concentration. The International System of Units (SI), stoichiometric calculations. 	3
Day 2	Lecture: <ul style="list-style-type: none"> – Basic thermodynamic changes in chemical reactions in biological systems 	2
Day 3	Lecture: <ul style="list-style-type: none"> – Basic thermodynamic changes in chemical reactions in biological systems – Kinetics of biochemical reactions 	2
Day 4	Lecture: <ul style="list-style-type: none"> – Biological catalysis – Chemical equilibrium – Structure and properties of water 	3
	Practical laboratory work: <ul style="list-style-type: none"> – Quantitative volumetric analysis. Precipitation titration: Determination of chloride by the Mohr method. Stoichiometric calculations: balancing reactions. 	3
Day 5	Lecture: <ul style="list-style-type: none"> – Disperse systems. Colloid systems. Heterogenous (rough) dispersion – Electrolyte solutions 	2
	Practical laboratory work: <ul style="list-style-type: none"> – Kinetics of chemical processes – Principles of kinetic determinations: experimental monitoring of chemical reactions kinetics. Factors that affect reaction rates. 	3

Week two		
Day 1	Lecture: <ul style="list-style-type: none"> – Balances in disperse systems – Buffer systems – Colligative properties 	3
	Practical laboratory work: <ul style="list-style-type: none"> – pH, buffers, hydrolysis - stoichiometric calculations 	3
Day 2	Lecture: <ul style="list-style-type: none"> – Redox processes – Properties of carbon 	2
	Practical laboratory work: <ul style="list-style-type: none"> – Basic principles of physical-chemical methods – Determination of Fe^{3+} ions by UV/VIS spectrophotometry 	3
Day 3	Lecture: <ul style="list-style-type: none"> – Redox processes – Properties of carbon – Functional groups; main types of biochemical reactions; isomerism 	2
Day 4	Lecture: <ul style="list-style-type: none"> – Carboxylic acid – Peptides and proteins; the properties of peptide bond 	3
	Practical laboratory work: <ul style="list-style-type: none"> – Application of separation techniques in qualitative and quantitative analysis of important biogenic compounds 	
Day 5	Lecture: <ul style="list-style-type: none"> – Carbohydrates: monosaccharides, disaccharides – Structure of proteins; protein conformation and dynamics 	3
	Practical laboratory work: <ul style="list-style-type: none"> – Qualitative determination of functional groups of biologically important compounds: citric acid, phenol, chloroform, acetone, glucose, sucrose, protein 	3
Week three		
Day 1	Lecture: <ul style="list-style-type: none"> – Heterocyclic compounds – Pyrimidine and purine bases – Nucleosides, nucleotides, nucleic acids 	3

Day 2	Lecture: <ul style="list-style-type: none"> – Lipids: triglycerides, sterols–cholesterol, phospholipids, bile acid, sphingolipids – Chemical structure of hormones 	2
Day 3	Practical exam I Colloquium I	4
Day 4	Lecture: <ul style="list-style-type: none"> – The role and metabolism of body water – amount and distribution; water balance and regulation Lecture: <ul style="list-style-type: none"> – Gas transport biochemistry; homeostasis and regulation processes in the human body; acid-base status; organ systems responsible for acid-base regulation 	2 2
Day 5	Lecture: <ul style="list-style-type: none"> – Metabolism of minerals in the body Practical laboratory work: <ul style="list-style-type: none"> – Osmosis; diffusion; preparation of physiological solutions 	2 3
Week four		
Day 1	Lecture: <ul style="list-style-type: none"> – Trace elements Lecture: <ul style="list-style-type: none"> – Biochemistry of amino acids – classification and properties; important peptides 	2 2
Day 2	Lecture: <ul style="list-style-type: none"> – Protein structures – denaturation and proteolysis; protein structure – function relationship; hemoglobin – allosteric protein Practical laboratory work: <ul style="list-style-type: none"> – Osmotic pressure investigation – effects on red blood cells; dialysis 	2 3
Day 3	Lecture: <ul style="list-style-type: none"> – Glycoproteins; biochemistry of homo and heteroglycans Practical laboratory work: <ul style="list-style-type: none"> – Color reactions of proteins and amino acids; fractional precipitation of proteins 	2 3
Day 4	Lecture: <ul style="list-style-type: none"> – Lipids – structure and function Practical laboratory work:	2

	– Precipitation reactions of proteins; electrophoresis; qualitative reactions of cholesterol; qualitative reactions of bile acids	3
Day 5	Lecture: – Water soluble and fat soluble vitamins; vitamins as coenzymes; enzymes – general properties	2
	Practical laboratory work: – Reactions on vitamins; quantitative reaction on alpha-amylase (Wohlgemuth method)	3
Week five		
Day 1	Lecture: – Classification of enzymes; enzyme activity and units of enzyme activity; multiple forms of enzymes (isoenzymes); enzymes as diagnostic tools	2
	Practical laboratory work: – Ptyalin activity and thermolability; pepsin activity; urease activity; aldehyde dehydrogenase activity	3
Day 2	Lecture: – Fuel metabolism – dietary components; the fed and fasting state	2
	Lecture: – The generation and utilization of metabolic energy; biological oxidation and electron transport chain	2
Day 3	Partial exam II Colloquium II	3
17 th -18 th Week	Final exam (regular term)	
19 th -20 th Week	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0204	Course title: Fundamentals of Clinical Practice/Skills		
Level: preclinical	Study year: I	Semester: II	ECTS: 2
Status: obligatory	Total contact hours: 30		
Prerequisites:	According to the Study Regulation		
Lecturers: Professor Senija Rašić, MD PhD; Assistant professor Damir Rebić, MD PhD; Senior Assistant Medžida Rustempašić, MD MSc			
1. Overall aim	The overall aim of Fundamentals of Clinical Practice / Skills Course is to increase knowledge on different basic clinical skills required for work with patients.		
2. Course contents	<p>The following topics will be covered during the Modules:</p> <p>Module 1. Introduction to Clinical Medicine The aim of the Module is to introduce a student with ethical principles in clinical practice, with administrative and medical procedures after patient admission to the hospital.</p> <p>Module 2. Health care of patient The aim of the Module is to introduce a student with principles of health care and a complementary relationship of health care and treatment.</p> <p>Module 3. Observation and taking of body fluids for examination The aim of this Module is practical introduction of student with the proper taking of human material and fluid for examination.</p> <p>Module 4. Giving prescribed therapy The aim of this Module is to teach the student to interpret the temperature chart, to prepare the medications for a different application form, and administering prescribed therapy with the assistance of an assistant, as well as during exercise on phantoms.</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge necessary for an understanding of ethical principles in clinical practice, administrative and medical procedures after admission to the hospital. They will become familiar with the principles of health care and proper sampling practice. Students will be able to handle different type of therapy administration by practicing on the phantom model. Student will master clinical skills using method of “4 steps by Peyton” and exercise on phantoms.</p> <p><i>Through lectures and exercises, students will acquire following knowledge and competences skills:</i></p> <ol style="list-style-type: none">1. Know the basic principles of patient care.2. Learn the exact procedures of taking human material and secretions and that the proper sampling of biological material is precondition		

	<p>for adequate laboratory analysis and correct lab report.</p> <p>3. Discover that quality health care allows patients faster recovery.</p> <p>4. Learn different type of therapy administration.</p> <p><i>Through the practical exercises, students will acquire following skills:</i></p> <ul style="list-style-type: none"> - Assessment of general appearance - Assessment of states of consciousness (normal, disturbed) - Assessment of vital signs - Interpretation of temperature charts - Proper handling the mobile and immobile patient - Replacement of urinary bladder bag - Intramuscular administration of drugs - Intravenous administration of drugs - Assessment of food and fluid intake - Blood sampling - Urine sampling - Sputum sampling - Stoll sampling - Taking swabs - Marking and sending materials for laboratory examination
4. Teaching methods	<p>Lectures: 10 hours</p> <p>Practical work: 20 hours.</p>

5. Method of knowledge assessment and examination	<p>- Written tests in the form of Multiple choice questions (MCQ) tests</p> <p>- Practical exam</p> <p>Continuous knowledge and skills assessment will be carried out through the training student on practical exercises, on Partial exam and on Practical exam.</p> <p><i>Partial exam</i></p> <p>Partial exam consists of a written test with 30 MCQ, and includes the verification of acquired knowledge through all Modules. Each correct answer to MCQ question carries 2 points, a total of 60 points. To be considered passed the exam, student will need to earn at least 33 points. Earned points are added to other points in the final grade. Students who failed the Partial exam, the examinations taken the material on the the Final exam.</p> <p><i>Practical exam</i></p> <p>Practical exam includes an assessment of skills acquired during the exercises, which are listed in the chart of practical training. Evaluation of acquired skills will be done through the fulfillment of the tasks previously defined in the check list. Each task carries a certain number of points. The maximum number of points that a student can earn is 30. In order to consider the practical exam passed, student has to earn at least 16.5 points. Achieved points are added to other points in the formation of the final grade.</p> <p>Continuous assessment</p> <p>Through continuous assessment and mastery of skills at the training the student should be able to:</p> <ul style="list-style-type: none"> –describe the process of admissions to hospital (+ or -) – assess the state of mind of patients (+ or -) –describe the appearance of the skin (+ or -) –measure (with help) weight and height of patients (+ or -) –determine the vital parameters (measure body temperature, blood pressure, pulse, respiratory rate) (+ or -) –change the moveable / immobile patient with the help of (+ or -) –replace urinary bag and measure diuresis (+ or -) –do (with help) the hygienic treatment of patients in bed (+ or -) –feed the patients (+ or -) –specify the basic type of diet (+ or -) –describe the process of taking blood sample for laboratory analysis (+ or -) –describe the process of taking blood sample for blood cultures (+ or -) –describe the process of taking urine sample for laboratory examination
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	<p>(+ or -)</p> <p>–describe the process of taking stool sample for laboratory examination (+ or -)</p> <p>–describe the process of sputum specimen collection for microbiological examination (+ or -)</p> <p>–describe the preparation of drugs for oral application (+ or -)</p> <p>–describe the preparation of drugs for intramuscular administration (+ or -)</p> <p>–describe the preparation of drugs for subcutaneous (+ or -)</p> <p>–describe the preparation of infusion solution (+ or -)</p> <p>–describe and give intramuscular injection (+ or -)</p> <p>–describe and give a subcutaneous injection (+ or -).</p> <p>Two positive assessment of exercises (2+) are worth one point and are added to the total number of points achieved in the test. The student must on that basis can win at least 6 points and a maximum of 10 points. Achieved points added to other points in the formation of the final grade.</p> <p>Final exam</p> <p>If student failed to pass the Partial exam, the examinations material is deposited on the Final exam. Final exam has 30 MCQ, through which a student can earn 60 points. The minimum number of points to pass the exam, is 33 points.</p> <p>The condition for passing the written part of the Final examination is previously passed the Practical exam.</p> <p>Achieved points are added to other points and together form the final score. The minimum number of points for passing grade is 55.</p> <p>Make-up exam and Remedial exam</p> <p>Repeated and Remedial exams take place according to previously defined criteria of the final examination.</p>
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	<p>The total number of points won on all forms of knowledge testing is translated into the final grade as follows:</p> <table><tr><th><i>Rating</i></th><th><i>Number of points</i></th><th><i>Description Rating</i></th></tr><tr><td>10 (A)</td><td>95-100</td><td>remarkable success without mistakes or with minor errors</td></tr><tr><td>9 (B)</td><td>85-94</td><td>above average, with some mistakes</td></tr><tr><td>8 €</td><td>75-84</td><td>average, with subtle errors</td></tr><tr><td>7 (D)</td><td>65-74</td><td>generally good, but with significant shortcomings</td></tr><tr><td>6 €</td><td>55- 64</td><td>meets the minimum criteria</td></tr><tr><td>5 (F,FX)</td><td>< 55</td><td>does not meet the minimum criteria</td></tr></table>	<i>Rating</i>	<i>Number of points</i>	<i>Description Rating</i>	10 (A)	95-100	remarkable success without mistakes or with minor errors	9 (B)	85-94	above average, with some mistakes	8 €	75-84	average, with subtle errors	7 (D)	65-74	generally good, but with significant shortcomings	6 €	55- 64	meets the minimum criteria	5 (F,FX)	< 55	does not meet the minimum criteria
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5 (F,FX)	< 55	does not meet the minimum criteria																				
6. Literature	<p>Recommended:</p> <ul style="list-style-type: none">– Rebeiro G, Jack L, Scully N, Wilson D. Fundamentals of Nursing: Clinical Skills Workbook (2nd edition). Elsevier; 2013.– Mengel MB, Holleman WL, Fields SA. Fundamentals of Clinical Practice. Publisher Springer US; 2002. <p>Additional:</p> <ul style="list-style-type: none">– Rašić S, Vanis N. Osnovi kliničke prakse. Sarajevo: Medicinski fakultet Univerziteta u Sarajevu; 2011.																					
7. Remarks	<ul style="list-style-type: none">– Schedule of students per group will be on the notice board of the School of Medicine amphitheater within Clinical Center University of Sarajevo. The exercises can be accessed only by students holding a valid sanitary booklet and proper clothing.– Announcement of consultations with teachers and associates participating in the realization of lesson.– Consultations for students will be held from 13 to 14 hours each working day, with a prior announcement by e-mail: senija.rasic@mf.unsa.ba; damir.rebic@mf.unsa.ba– Professor in charge: Professor Senija Rašić, MD PhD																					

COURSE PLAN: FUNDAMENTALS OF CLINICAL PRACTICE / SKILLS

Week 9.	Form of teaching	Number of hours
Monday	Lecture: Receiving patients in the hospital (access to the patient, the attitude towards patients, professional secrecy, the procedure with the patient, opening of medical history, the position of the patient in bed, transfer of patients)	1
	Lecture: Observing patients (vital signs: temperature, pulse, blood pressure, breathing, state of mind.) Observing secretions.	2
	Exercises: Participate in the morning visit (students observe) Assessment of patients (students observe, help and perform under supervision) <ul style="list-style-type: none"> - observation patients - assessment of the state of consciousness (normal, disturbed) - measurement of body weight and height - assessment of skin tone (registration striking change) - measuring body temperature - measuring respiratory rate - heart rate 	3
Tuesday	Lecture: Health care in the bed (patient care and health care through medical and technical procedures, work interactively with other professionals in health care, nurse – physician assistant)	1
	Lecture: The importance of personal hygiene of the patient (hygiene of the skin and mucous membranes, prevent pressure sores, hygiene of bedding)	1
	Exercises: Care and hygiene of patients in bed (and help students perform) <ul style="list-style-type: none"> - checks and assistance in personal hygiene patients - changes in clothes patient - changing bed linen - prevention of decubitus - replacement urinary bags - setting geese and shovels 	4

	- registration looks secretion	
Wednesday	<p>Lecture: Principles of special patient care (Care of patients suffering from respiratory diseases, cardiovascular patient care, care of patients with diseases of the digestive tract, care of kidney patients)</p> <p>Lecture: Nutrition of patients (organization of nutrition of patients in hospitals, natural nutrition, artificial nutrition)</p> <p>Exercises: Nutrition of patients (student helps you performed)</p> <ul style="list-style-type: none"> - introduction to the basic diets - feed patients orally - feeding patients through a nasogastric tube - registration of fluid intake <p>Giving prescribed therapy (students observe and assist). Preparation of drugs for:</p> <ul style="list-style-type: none"> - Oral - Parenteral administration - The use of one-time medical supplies in compliance with the principles of sterility - The preparation of infusion solutions 	<p>1</p> <p>1</p> <p>2</p> <p>2</p>

Thursday	Lecture: Sampling for laboratory analysis (for chemical analysis, blood cultures, urinalysis, sputum samples of body cavities, cerebrospinal fluid, biopsy sample, the sample label).	1
	Lecture: The principles of the preparation and therapy administration (oral, sublingual, subcutaneous, intramuscular, intravenous, infusion therapy)	1
	Exercises: Sampling for laboratory analysis (students observe) <ul style="list-style-type: none"> - taking sputum samples for laboratory examination - blood samples for chemical analysis - taking blood samples for blood cultures - taking urine samples for laboratory examination - sampling urine for culture - sampling stool for culture - introduction to the accompanying documentation for laboratory examinations 	2
	Giving prescribed therapy (performed by students under the supervision) <ul style="list-style-type: none"> - interpretation of temperature charts - administering oral therapy (tablets, capsules, dragees, application lingualette) - giving parenteral therapy - by subcutaneous administration of the drug - the drug-delivery intramuscular injection - administration of the drug by intravenous injection - medication delivery device in the form of infusion 	2
Friday	Partial exam	

	<p><i>Exercises:</i></p> <p>Sampling for laboratory analysis (students observe)</p> <ul style="list-style-type: none"> - taking sputum samples for laboratory examination - blood samples for chemical analysis - taking blood samples for blood cultures - taking urine samples for laboratory examination - sampling urine for culture - sampling stool for culture - introduction to the accompanying documentation for laboratory examinations <p>Giving prescribed therapy (performed by students)</p> <ul style="list-style-type: none"> - giving parenteral therapy - by subcutaneous administration of the drug - the drug-delivery intramuscular injection - administration of the drug by intravenous injection - medication delivery device in the form of infusion <p>Practical exam</p>	<p>1</p> <p>1</p> <p>2</p> <p>2</p>
Weeks 17/18.	Final exam (regular term)	
Weeks 19/20	Final exam (make-up examination term)	
September	Final term (September term)	

Code: MFSE 0205		Course title: Introduction to Scientific Methods 1	
Level: preclinical	Study year: I	Semester: II	ECTS: 2
Status: obligatory	Total contact hours: 30		
Lecturers: Prof Semra Čavaljuga MD MSc DSc; Prof Maida Todić-Rakanović MD MSc DSc; Prof Asija Začiragić MD MSc DSc; Prof. Mirsad Dorić MD MSc DSc; Assistant Prof Lejla Burnazović-Ristić MD MSc DSc; Senior TA Lejla Džananović MD MSc; Senior TA Sanita Maleškić MD			
Prerequisites: According to the study regulations			
1. Overall aim	The aims of this course are the following: <ul style="list-style-type: none">• Introduction to basic principles of scientific research in medicine• Educating students on how to properly read and understand scientific papers, as well as how to write and present professional and scientific work• Learning and understanding the basics of ethical rules in biomedicine and stepwise approach to planning and implementing biomedical studies.		
2. Purpose of the course	Through this course, students should adopt basic knowledge and skills of methods and tools for conduction of research in medicine, being introduced to basic characteristics of study design and basics of interpreting study results. Students will gain basic knowledge for planning and designing a research project in medicine and will be enabled to independently write and present a scientific or professional paper.		
3. Learning outcomes	<p>Through this course, students will acquire the following knowledge:</p> <p>Module 1. Science in medicine</p> <p>Foundation of scientific thought and specifics of scientific way of thinking, prerequisites of scientific research. Ethical code in scientific research and publishing, reviewing plagiarism in particular.</p> <p>Module 2. Browsing the medical literature and available information online, basics of creating a poster presentation</p> <p>Basic characteristics of medical literature, types of publications in medicine, electronic sources of medical information and assessment of its relevance, browsing medical literature and available information online. Basics of writing professional/scientific paper. Form and content of poster presentation.</p> <p>Module 3. Medical research and basics of writing a seminar paper</p> <p>Types of medical research, experimental studies. Introduction to concepts of</p>		

forming a research sample, hypothesis in a research, and basics of collecting, analyzing and data presentation. Basics of writing a professional/scientific paper. Form and content of a seminar paper.

Module 4. Presenting scientific or professional paper

Methods of presenting results of a research in a form of scientific or professional paper – oral and poster presentation. Basic techniques in creating a presentation. Basics of presentation of biomedical research results.

Through this course a student will gain the following skills:

Skills that students should master after the lectures of this course:

- adequately formulate scientific and medical problems
- successfully browse available sources of information and select the most relevant sources
- basics of biomedical research design
- content, form, and methodology of writing scientific and professional paper / review paper / seminar paper / essay
- adequate citing of literature in medical publications
- different forms of adequate presentation of research results (oral/poster presentation) and basics of presenting in general.

Every student should know how to:

- browse through scientific and professional medical literature
- write a seminar paper and create a poster presentation
- adequately cite the literature within medical publications
- present data and research results.

	<p><i>Attitudes a student should master after the completion of this course:</i></p> <ul style="list-style-type: none"> – respecting ethical norms and regulations is significant to biomedical research – critical thinking is necessary in both scientific work and clinical practice – studiousness and comprehensiveness have key roles in planning and implementing research – interdisciplinary approach to scientific research is indispensable – quality of presented data and results is immensely significant for integrity of every biomedical research.
4. Teaching methods	<ul style="list-style-type: none"> – Lectures: 15 hours – Seminars: 15 hours
5. Methods of knowledge assesment and examination	<p>Through the course, continuous knowledge assessment will be carried out through:</p> <ul style="list-style-type: none"> – Seminar paper – two (2) in total – Oral exam. <p>Seminar paper should be written based on individual and group work within a group of students, on topic provided during the course of lectures. Oral exam consists of presenting one of the written seminar papers (of students' choice) and answering teacher's questions regarding the particular topic of the seminar paper / presentation / matter taught through the course of lectures.</p> <p>The final grade is calculated according to points given for every knowledge assessment form:</p> <ul style="list-style-type: none"> - Seminar paper I – 30% of total points - Seminar paper II – 30% of total points - Oral exam – 40% of total points. <p>The final grade is calculated as a pondered arithmetic mean of all grades given through this course.</p> <p>Grading of writing parts of the exam will be performed with respect to rules and regulations of syllabi harmonization of Bologna studying for every single exam term as following:</p>

	<table><tr><th>Grade</th><th>No of points</th><th>Grade description</th></tr><tr><td>10 (A)</td><td>95-100</td><td>Exceptional with minor errors</td></tr><tr><td>9 (B)</td><td>85-94</td><td>Above average with few errors</td></tr><tr><td>8 (C)</td><td>75-84</td><td>Average, with noticeable errors</td></tr><tr><td>7 (D)</td><td>65-74</td><td>Good, with significant errors</td></tr><tr><td>6 (E)</td><td>55-64</td><td>Meets minimal criteria</td></tr><tr><td>5 (F, FX)</td><td>< 55</td><td>Fails to meet minimal criteria</td></tr></table>	Grade	No of points	Grade description	10 (A)	95-100	Exceptional with minor errors	9 (B)	85-94	Above average with few errors	8 (C)	75-84	Average, with noticeable errors	7 (D)	65-74	Good, with significant errors	6 (E)	55-64	Meets minimal criteria	5 (F, FX)	< 55	Fails to meet minimal criteria
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5 (F, FX)	< 55	Fails to meet minimal criteria																				
	<p><u><i>In order to be given a passing final grade, student must obtain a passing grade from all forms of knowledge assessment.</i></u></p>																					
6. Literature	<p>Required</p> <ul style="list-style-type: none">– Course hand-outs– Group of authors. Research and Scientific Work in Medicine. To be published by Faculty of Medicine University of Sarajevo – in preparation. <p>Extended</p> <ul style="list-style-type: none">– Rosenbaum P. Design of Observational Studies. Springer Science Business Media. LLC 2010.– Chow SC & Liu JP. Design and analysis of Clinical Trials. J Wiley& Sons Inc. New Jersey. 2004.– Piantadosi S. Clinical Trials A Methodologic Perspective. J Wiley& Sons Inc. New Jersey. 2005.																					
7. Remarks	<p>All forms of classes are obligatory. In case a student misses more than 10% of classes (excused or not excused) one is obliged to colloquially pass all the missed lectures and seminars with lecturer(s) in charge.</p> <p>Student office hours are published in a separate schedule which can be found on the Department’s notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department’s secretary or via e-mail: epidemiologija@mf.unsa.ba.</p> <p>Consultation hours : each working day 12.00-14.00</p>																					

COURSE PLAN: INTRODUCTION TO SCIENTIFIC METHODS 1

Lesson No.	Teaching methods	Contact hours
Lesson 1.	Lecture: History of scientific thought development, medicine and paramedicine. Foundations of scientific thought and specifics of scientific thinking, prerequisites of scientific research.	2
Lesson 2.	Lecture: Ethical code in scientific research and publishing, Etički kodeks u naučnom istraživanju i publiciranju, reviewing plagiarism in particular	2
Lesson 3.	Lecture: Basic characteristics of medical literature, types of medical publications. Browsing medical literature.	2
Lesson 4.	Seminar: Electronic sources of medical information and assessment of its relevance. Browsing medical literature and available information on the internet.	2
Lesson 5.	Lecture: References and quotations in biomedical publications. Styles of referencing.	2
Lesson 6.	Seminar: Structure and writing of review paper. Form and content of poster presentation.	2
Lesson 7.	SEMINAR WORK 1	2
Lesson 8.	Lecture: Types of medical research. Basics of design and methodology of biomedical studies. Types of medical research, experimental studies. Introducing to concepts of forming a research sample, research hypothesis, and basics of collecting, analyzing and presenting data. Basics of writing a professional/scientific paper. Form and content of a seminar paper.	2
Lesson 9.	Lecture: Basics of forming a research sample in biomedical studies. Seminar: Basics of collecting data in biomedical research.	1 1
Lesson 10.	Seminar: Basic elements of analysing collected data and presenting results of a research.	2
Lesson 11.	Seminar: Form and content of a seminar (scientific/professional) paper.	2
Lesson 12.	Lecture: Methods of presenting results of a research as a scientific or professional paper – oral and poster presentation.	2
Lesson 13.	Seminar: Basic techniques in creating a presentation. Basics of presentation of biomedical research results.	2
Lesson 14.	SEMINAR WORK 2	2

Lesson 15.	ORAL EXAM	2
Week 17-18.	Final exam (regular term)	
Week 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0206	Course title: Social Medicine and Organization of Health Care 1		
Level: preclinical	Study year: I	Semester: II	ECTS: 2
Status: obligatory	Total contact hours: 40		
Prerequisites:	According to the Study Regulation		
Lecturers:	Professor Amela Džubur-Alić Md PhD		
1. Overall aim	The overall aim of this course is to help students increase understanding of the fundamental knowledge of the influence of social medicine factors on both health and disease as well as on a way of organizing and functioning of the healthcare system.		
2. Course contents	<p>The following topics will be covered during the Modules:</p> <p>Modul. 1. Social medicine and public health The aim of this module is to understand social medicine as part of a bigger picture called medicine, its part and importance in the practice of general medicine practitioners.</p> <p>Modul 2. Comprehension and advancement of health The aim of this module is to understand the importance of health for the individual as well for society, to familiarize with the health model, to define, recognize and monitor key health determinants, to identify the risk behavior of the individual, group and population, and acquire knowledge and skills to master health promotion and disease prevention.</p> <p>Modul 3. Health-educational work with a healthy individual and population The aim of this module is to determine the place and role of health education in the work of the physician and to develop the necessary skills for the health care of the individual, the group and the community in order to improve and maintain the health of the population and to prevent disease; mastering basic knowledge about the importance of communicating with a patient, family, and community.</p> <p>Modul 4. Population and its social medical characteristics which includes social medical approach of resolving basic health issues within population The aim of this module is to understand the importance of the social-medical approach in solving the basic problems of an individual, community and population groups with the support of basic health and disease information.</p> <p>Modul 5. Organization of a health system The aim of the module is to acquire basic knowledge about the characteristics and organization of the health system and the necessary health resources for functioning of one health system.</p>		

	<p>Modul 6. State involvement in health care of population</p> <p>The aim of this module is to acquire basic knowledge about the importance of health policy, the role of the state and international cooperation for the health of the population, as well as acquiring basic knowledge about the ways of health care financing, how to pay health services, and the cost of health care.</p>
<p>3. Learning outcomes (Knowledge, skills and competences)</p>	<p>Student will acquire knowledge necessary for understanding of social medical approach in observation and research that will lead to further successful work of medical doctors in enhancement of health care of population.</p> <p>Student will be able to understand social medicine, as a part of integral medicine as well as its orientation and importance in general practitioner career</p> <p>Student will be able to understand the importance of individual health as well as health of whole population, familiarizing with the health model, defining, identification and monitoring of basic health determinants, identification of health risk behaviour of an individual, group and population and acquiring knowledge and skills for implementing promotion of health and disease prevention</p> <p>They will be able to describe the place and role of health education in doctors career and develop skills needed for health education of an individual, group and population in general, for the purpose of enhancement and sustainability of populations health and disease prevention; acquire proficiency in importance of doctors communication with patient, family and community</p> <p>Student will understand the importance of social medical approach in resolving basic problems of individual, primary communities and population groups supported with basic information about health and disease</p> <p>Student will get fundamental knowledge about characteristics and organization of health system and needed health resources for proper functioning</p> <p>Student will get fundamental knowledge about importance of health politics, state role and international cooperation for population health, as well as acquiring basic knowledge about different ways of financing health coverage, payment of health services and price of health and disease</p> <p><i>Through the lectures and seminars the students will gain following knowledge and competences:</i></p> <ul style="list-style-type: none"> • Public health approach in observation of health and diseases • Observation of whole population health status • Observing characteristics and organization of health system • Getting fundamental knowledge about importance of health politics

	<p><i>Through the practical work students will acquire following skills:</i></p> <ol style="list-style-type: none"> 1. observing the phenomena of life in the community, in correlation with health servation of events 2. Finding sources of adequate data 3. examining of health lifestyles 4. examining of quality of life 5. application of methods of health education 6. examination of the determinants of health of the family 7. assessment of insurance of municipality health workforce 8. determining the biological type of the population
4. Teaching methods	<p>Lectures: 20 hours</p> <p>Practical work: 20 hours</p>
5. Method of knowledge assessment and examination	<p>The practical work carry out a continuous check of the skills mastery. In practical work, the student can win a maximum of 30 points and a minimum of 19 points.</p> <p>Partial exam 1 consists of the practical and theoretical part.</p> <p>On the first partial exam, the student can win a maximum of 35 and a minimum of 18 points. On the theoretical part of the partial exam the student can win a maximum of 20, at least 10 points. On the practical part of the partial exam the student can win a maximum of 15, at least 8 points. In order for a partial exam to be passed, the student must have obtained the minimum number of points from the practical and theoretical part of the exam.</p> <p>Partial Exam 2 consists of the practical and theoretical part..</p> <p>On the second partial exam, the student can win a maximum of 35 and a minimum of 18 points. On the theoretical part of the partial exam the student can win a maximum of 20, at least 10 points. On the practical part of the partial exam the student can win a maximum of 15, at least 8 points. In order for a partial exam to be passed, the student must have obtained the minimum number of points from the practical and theoretical part of the exam.</p> <p>The requirement for a student to enter the final exam is completed and submitted practical work to the responsible assistant.</p> <p>If a student has not completed one of the partial exams, he / she will take that partial exam on the final exam.</p> <p>If a student has not passed both of the partial exams, the final exam will be an integral exam consisting of a practical and theoretical part. The student can win a maximum of 70 and at least 35 points on the integral exam</p>

6.Literature	<p>Obligatory:</p> <ul style="list-style-type: none"> – Roberts M, Hsiao W, Berman P, Reich M. Getting health reform right. Washington: The World Bank Institute and Harvard School of Public Health, 2001, 303 pp. – Robinson,J., Elkan,R.: Health Needs Assessment. Churchill Livingstone, UK, 2002, 250pp. (ISBN 0443 05233) – Mossialos E, Dixon A, Figueras J, Kutzin J. Funding health care: options for Europe. European Observatory on Health Care Systems Series. Buckingham, Philadelphia: Open University Press, 2002.
7.Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: socijalna.medicina@mf.unsa.ba</p>

COURSE PLAN: SOCIAL MEDICINE AND ORGANIZATION OF HEALTH CARE 1

Week	Form of teaching	Number of hours
Week 1.	<p>Lecture: Social medicine and public health (presentation of the development of health and orientation, definition and subject, new public health)</p> <p>Practical classes: Introduction to practical work, getting acquainted with methods of work in the field of social medicine</p>	1 1
Week 2.	<p>Lecture: Understanding of health and quality of life (overview of definitions and presentation of health models, subjective health assessment and quality of life)</p> <p>Practical classes: Presentation of the questionnaire for measuring the quality of life</p>	1 1
Week 3.	<p>Lecture: Determinants of health and health care, introduction to the definition, identification and monitoring of basic determinants of health: equity and equality in health, content of the millennium goals; health care through multisectoral cooperation</p> <p>Practical classes: Analysis of the value of health determinants in the population of the Federation of BiH with a case report</p>	1 1
Week 4.	<p>Lecture: Health behavior (risk behavior, risk factors)</p> <p>Practical classes: Health behavior (surveying healthy individuals in relation to risky behavior)</p>	1 2
Week 5.	<p>Lecture: Health of the vulnerable groups of the population</p> <p>Practical classes: Styles of life</p>	1 1
Week 6.	<p>Lecture: Health promotion - definition, concept, principles and practice of health promotion</p> <p>Practical classes: Social marketing, for example solving the major health problems (smoking, drinking alcohol, iodine in salt, etc.)</p>	1 1
Week 7.	<p>Lecture: Health care work in the community - definition of health education, concept, principles and practice of health education; motivation, methods (individual and group) and resources for health education</p> <p>Practical classes: The idea for creating a health education program</p>	2 2

Week 8.	Partial exam 1	1
Week 9.	Lecture: Population and its social and medical characteristics; units of observation in social medicine (individual, group), population health in FBiH and the world; population policies Practical classes: Family and health, survey of two families by social medical characteristics and analysis of the obtained results	2 2
Week 10.	Lecture: Social medical approach to solving the basic problems in the community; collecting, processing data and setting social-community diagnosis; health indicators Practical classes: Social diagnostics of the community on an example of a municipality (demographic, vital and indicators of the health system)	2 2
Week 11.	Lecture: Introduction to the health system and its organization, characteristics of the health system and the principles of its organization, health workers, health institutions, network of health institutions in FBiH Practical classes: Algorithm of health care organization according to protection levels of health institutions network in the area of one municipality	2 2
Week 12.	Lecture: Primary health care in the service of health promotion - responsibility for the health of well-defined populations Practical classes: Community work of doctors	1 1
Week 13.	Lecture: Economic aspects of health and disease, both direct and indirect health costs, models of financing health care, ways of payment of health services Practical classes: Funds for health care per user	1 2
Week 14.	Lecture: Legislations in health care and health policies; right to have health care; legal aspects of health; state functions in health care; international systems in health protection Practical classes: Discussion of the Law on Health Care and Health Insurance of the Federation of BiH with the presentation of interesting cases	2 1
Week 15.	Partial exam 2	2
Week 17-18.	Final exam (regular term)	
Week 19.-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0207	Course title: Bosnian Language 2		
Level: preclinical	Study year: I	Semester: II	ECTS: 2
Status: obligatory	Total contact hours: 30		
Prerequisites:	According to the Study Regulation		
Lecturers: Engaged teachers from the core faculty			
1. Overall aim	Students learn basis of Bosnian language extended by information on Bosnian culture and geography. They understand simple and familiar words and some complex phrases. They are able to use vocabulary related to personal and family information and understand extended sentences and use questions requiring extended answers. They can read longer text related to topics such as shopping, local geography, restaurants and Bosnian culture and communicate in simple and routine tasks using more complex phrases. Introduction of specific medical vocabulary.		
2. Course contents	Students can understand sentences and frequently used information related to themselves, their family and everyday activities as well as to their interests and intensions. They can communicate using simple sentences and frequently used words. They are familiar with some specific medical vocabulary.		
3. Learning outcomes (Knowledge, skills and competences)	<p>Listening: After this course, students can understand some more complex phrases and extended vocabulary related to greetings, introduction, situations in the hotel, on the street, on the airport, in the bank etc. They can understand simple messages on TV.</p> <p>Reading: Students can read simple text. They are able to find specific information in simple everyday material such as menus and timetables as well as advertisements and prospects. They can understand simple personal letters.</p> <p>Speaking: Communication on this level is based on exchange of simple information on familiar topics and activities. They can present themselves and keep simple social information exchange. At this level, students can handle simple conversation in the bank, in the shop or in the post, for example.</p> <p>Writing: The students can write simple, short notes related to their background, their daily activities or to their family, for example. They use simple medical words and phrases. They are able to fill forms with personal details.</p> <p>Grammar: Students are expected to achieve a level of corresponding knowledge of the basic Bosnian grammatical structures as well as the main usage features of the language.</p>		

4. Teaching methods	The course is performed in form of Lectures (15) Practical works (15)
5. Method of knowledge assessment and examination	EXAM 1. Partial exam (week 8.) 2. Final exam (after the course)
6. Literature	Obligatory: – Midhat Ridžanović, Bosnian for Foreigners, Spirit of Bosnia Volume 7 No. 3 (2012) (selected parts) – Minela Kerla i Nermina Alihodžić-Usejnovski, Bosanski jezik: komunikacijski priručnik za strance sa zadacima i vježbama, Sarajevo, 2013 (selected parts) – English-Bosnian dictionary upon own choice
7. Remarks	Student office hours are published in a separate schedule which can be found on faculty website. Pre-agreed consultations are obligatory and can be done by email: studentska.sluzba@mf.unsa.ba

COURSE PLAN: BOSNIAN LANGUAGE 2

Week	Teaching method and materials	Number of hours
Week 1.	Lecture: Accusative of adjectives. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 2.	Lecture: Genitive case. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 3.	Lecture: Possessive pronouns and adjectives. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 4.	Lecture: Perfective and imperfective verbs. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 5.	Lecture: Congruence of adjectives with nouns. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 6.	Lecture: Ordinal numbers. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 7.	Lecture: Denoting time. Time expressions. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 8.	HALF-SEMESTER (PARTIAL) EXAM	2
Week 9.	Lecture: Perfect tense Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 10.	Lecture: Future tense. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 11.	Lecture: Dative and locative case.	1

	Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1
Week 12.	Lecture: Word order. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 13.	Lecture: Direct and indirect speech. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 14.	Lecture: Instrumental case. Practical work: Practicing of the passed grammar. Speaking and writing exercises. Vocabulary.	1 1
Week 15.	Lecture: Recapitulation of the passed grammar during the course. Practical work: Spontaneous conversation. Speaking and writing exercises.	1 1
Week 17-18.	Final exam (regular term)	2
Week 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0208	Course title: Anatomical Basis of Peripheral Nerve Lesions		
Level: preclinical	Study year: I	Semester: II	ECTS: 1
Status: elective	Weeks: fifteen (15)		Total contact hours: 20
Lecturers:	Associate professor Eldan Kapur MD PhD		
Prerequisites: None			
1. Overall aim	Detailed insight into the origins, pathways, topographic relations and innervation areas of cranial and spinal nerves, and accurate identification of these structures from anatomical and clinical aspects. Practical significance of the knowledge of cranial and spinal nerves for understanding and interpreting numerous consequences of peripheral nerve lesions, and changes due to diseases of peripheral nervous system as a whole.		
2. Course contents	Testing cranial and spinal nerves is a significant part of neurological examination, and familiarity with them in the broadest sense of the word is also necessary for many diagnostic, anesthetic and surgical procedures in many areas of medicine. The aim of the course is to comprehensively study the anatomy of cranial and spinal nerves, including: nuclei in CNS, cortical links, exits from the skull and spinal canal, peripheral pathway and distribution of main nerve roots and their branches. Also, gaining knowledge of the typical symptoms of cranial and spinal nerve lesions and their practical significance, diagnostics and treatment.		
3. Learning outcomes	<p>During classes in the course „Anatomical basis of peripheral nerve lesions “students will acquire the following knowledge:</p> <p>Module 1. Cranial nerve nuclei. Functional categorization and morphology. Cranial nerve exits and their peripheral pathways. Distribution and zones of innervation. Clinical aspects of cranial nerve anatomy. Most frequent disorders and their symptoms. Diagnostics, therapy and practical significance</p> <p>Module aim: Students should become familiar with the morphology of brainstem, cranial nerve nuclei and their position, links and functional categorization, skeleton of the head as a whole, particularly with openings which individual cranial nerves or their branches pass through, and with peripheral distribution, particularly with their relations to other anatomical structures in a broader topographic region of head and neck. They should acquire a detailed, systematic and above all practical and applied knowledge of individual cranial nerves and their disorders. They should be familiar with the clinical anatomy of trigeminal nerve with a special focus on the anesthetic anatomy of head and neck significant for medicine.</p> <p>Module 2. Anatomical and functional characteristics of spinal cord. Spinal nerve, origin and types of fibers. Spinal nerve exits, peripheral pathway and ramification. Somatic nerve plexuses.</p>		

Distribution and zones of innervation. Clinical aspects of spinal nerve anatomy, typical disorders and their symptoms. Diagnostics, therapy and practical significance

Module aim:

Students should become familiar with anatomical and functional characteristics of spinal cord from the aspect of spinal nerve origin and categorization of nervous fibers they are made of. A detailed analysis of spinal nerve ramification upon their exit from spinal column with a focus on the origin of large plexuses of somatic nerves (cervical, brachial, lumbar, sacral). They should acquire knowledge of the peripheral distribution of branches of the plexuses of somatic nerves, with a focus on their relations with other anatomical structures in the topographic regions of head and neck, rib cage, abdomen, pelvis, as well as upper and lower extremities. They should have thorough, systematic and practical knowledge of individual spinal nerves and their lesions.

Through classes in the course „Anatomical basis of peripheral nerve lesions“, students will master the following **skills**:

- Skills that students should possess after the completed classes:

1. Understanding of anatomical nomenclature and Latin terminology
2. Orientation of bones with a focus on the knowledge of openings and topographic regions from the aspect of understanding topography and distribution of cranial and spinal nerves
3. Recognizing structures (particularly neural ones) in particular topographic regions,
4. Recognizing cranial and spinal nerves, bone and other orientation points significant for successful performance of local anesthetic procedures,
5. Recognizing basic mechanisms of injuries to peripheral nerves, symptoms of lesions, ways of their detection and treatment.

- Skills that students should possess and practically show after the completed classes

1. Orientation on preparations,
2. Recognizing anatomical structures and their mutual relations,

Upon the completed classes in the course „Anatomical basis of peripheral nerve lesions“ students should adopt the following **views**:

1. Consider cranial and spinal nerves as a morpho-functional whole significant for the study of medicine, and interacting with the

	body as a whole from the aspect of systematic, topographic, applied and clinical anatomy.
4.Teaching methods	<p>Classes are delivered in the form of:</p> <ul style="list-style-type: none"> - Lectures (10 hours) for all students - Tutorials (10 hours) for all students <p>Lectures – learning with the help of anatomical preparations and computer simulations, supervised learning on human preparations and isolated skeleton parts, and the analysis of X-ray radiographs,</p> <p>Practical works – analysis of morphological and topographic features of cranial and spinal nerves on human preparations.</p> <p>During the classes, students will be allowed to study independently on isolated parts of skeleton, cadaver and anatomical models.</p>
5.Methods of knowledge assessment and examination	<p>After the completed module 1, and module 2, MCQ tests with 20 questions.</p> <ol style="list-style-type: none"> 1. Attendance and active involvement in lectures - 10 points 2. Attendance and active involvement in practical works - 30 points 3. MCQ test 1 - 30 points 4. MCQ test 2 – 30 points <p>FORMING THE CUMULATIVE GRADE</p> <p>10 (A) – (outstanding success with negligible mistakes), carries 95-100 points,</p> <p>9 (B) – (above-average, with an occasional mistake), carries 85-94 points,</p> <p>8 (C) – (average, with noticeable mistakes), carries 75-84 points,</p> <p>7 (D) – (generally good, though with significant weaknesses), carries 65-74 points,</p> <p>6 (E) – (satisfies minimum criteria), carries 60-64 points,</p> <p>5 (F, FX) – (does not satisfy minimum criteria and requires far more work), below 60 points.</p>
<p>6.Literature</p> <p>Obligatory:</p> <ul style="list-style-type: none"> – Dilberović F, Kapur E, Deschner S, Vloka J. Hadžić A. Functional Regional Anesthesia Anatomy. In: Hadžić A. Regional Anesthesia and Acute Pain Management-Principles and Practice, 1st.Ed. McGraw-Hill, New York, 2006. – Monkhouse S. Cranial Nerves Functional Anatomy, Cambridge University Press; 1 ed; 2005 <p>Recommended:</p> <ul style="list-style-type: none"> – Afifi AK, Bergman RA. Functional Neuroanatomy – text and atlas, McGraw-Hill Education / Medical; 2 ed; 2005 	
<p>7. Remarks:</p> <p>Students are bound to be actively involved in all the scheduled activities, to regularly attend and actively participate in all forms of classes. Lectures and tutorials are delivered according to the detailed syllabus of the Department of Anatomy. The justified reason for absences from lectures is proven with truthful certificates. Students can make up for 20% absences from all the classes</p>	

only with a letter of excuse.

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COURSE PLAN: ANATOMICAL BASIS OF PERIPHERAL NERVE LESIONS

	Method of teaching and materials	Number of hours
Day 1.	<p>Lecture: Categorization of nervous system. Anatomical and physiological characteristics of somatic and autonomous nervous system. Structural elements of peripheral nervous system. Causes of peripheral nerve lesions. Basic classification of disorders by the way of origin and the degree of impairment of peripheral nerves. Clinical picture of peripheral nerve lesions. Anatomical and clinical characteristics of V cranial nerve. Somatosensory and special visceral motor component. Peripheral distribution and innervation zones. Clinical observations. Corneal reflex. Trigeminal neuralgia. Ophthalmic zoster. Osseous orientation points and anatomical basis of local and regional anesthetic procedures</p> <p>Practical work: Skull as a whole. Spots of cranial nerves exit. Skull holes and craniofacial cavities. Communication of topographic regions of the head.</p>	<p>2</p> <p>2</p>
Day 2.	<p>Lecture: Anatomical and clinical characteristics of VII cranial nerve. Visceral sensory, special visceral motor and parasympathetic component. Peripheral distribution and innervation zones. <i>Nervus facialis</i> lesions. Supranuclear facial palsy. Peripheral facial palsy. Anatomical and clinical characteristics of IX, X and XI cranial nerves. Functional anatomy (special visceral motor component, parasympathetic component and sensory component). Reflexes (swallowing, vomiting, coughing). Clinical observations (<i>n. glossopharyngeus</i> neuralgia, central and peripheral palsy of <i>n. vagus</i>, laryngeal nerve lesions). Anatomical and clinical characteristics of XII cranial nerve. Functional anatomy. Paralysis of XII cranial nerve. Bulbar palsy syndrome. Micro-anatomical and topographic characteristics of extra-cranial parts of cranial nerves and cranial nerve vascularization. Topographic, clinical and applied anatomy of head and neck interacting with intra- and extra-cranial parts of cranial nerves. Practical significance of familiarity with cranial nerves in medicine and dentistry</p> <p>Practical work: Anatomical basis of local anesthetic procedures in craniofacial region. Osseous orientation points. Osseous structure variants significant for approaches to cranial nerves. Topography of extra-cranial parts of cranial nerves</p>	<p>2</p> <p>2</p>
Day 3.	<p>Lecture: Anatomical and clinical characteristics of I cranial nerve. Olfactory pathways and cortical projections. Testing the sense of smell, anosmia, epileptic fits from <i>uncus gyri parahippocampalis</i>, olfactory meningioma. Anatomical and clinical characteristics of II cranial nerve. Vision pathway and system. Topography of vision pathway. Receptive fields and vision reflexes. Optic nerve lesions and optic chiasms. Lesion of optic tract and <i>tractus geniculocalcarinus</i>. Lesions of extrastriate visual areas</p> <p>Anatomical and clinical characteristics of III, IV and VI cranial nerves. Eye movements. Centers in the brainstem for controlling eye movements. Clinical observations (strabismus and diplopia,</p>	<p>2</p> <p>2</p>

	<p>conjugate gaze palsy). Pupillary light reflex. Anatomical and clinical characteristics of VIII cranial nerve. Vestibular receptors. <i>N. vestibularis</i> and nuclei. Central links. Links vestibular nuclei – spinal cord, vestibular nuclei – cerebellum. Oculogyric nuclei and vestibular ocular reflexes</p> <p>CN I-Clinical notes; Smells and the responses they can provoke; Anosmia; Cerebrospinal fluid rhinorrhea; Temporal lobe epilepsy; Clinical testing; CN II-Lesions of optic pathway; Other clinical notes; Clinical testing; CN III, IV, VI-Clinical notes; Midbrain lesions: oculomotor nerve, Oculomotor nerve injury; Intracranial disease: diagnostic usefulness of abducens nerve; The effects of raised intracranial pressure: oculomotor nerve; The effects of raised intracranial pressure: abducens nerve; Cavernous sinus thrombosis: all three nerves.; Pupillary light reflex; Accommodation reflex; Conjugate eye movements and their control; Clinical testing of eyes and eye movements. Clinical observations. <i>Organum spirale Corti</i> and transduction mechanism. Tonotopic organization. Central auditory pathways. Cortical presentations. Loss of hearing. Hearing test. Cochlear implants. Otosclerosis. Acoustic neurinoma. Hereditary hearing loss.</p> <p>Partial exam 1</p>	
Day 4.	<p>Lecture: Anatomical and functional characteristics of spinal cord. Organization of grey matter. Spinal nerve – morphological and functional characteristics. Dermatomes, myotomes, sclerotomes. Spinal nerve exits. Ramification. Origin of somatic nerve plexuses. Cervical plexus (<i>plexus cervicalis</i>). Lesions of <i>n. phrenicus</i>. Anatomical basis of conduction anesthesia of skin nerves in cervical plexus. Brachial plexus (<i>plexus brachialis</i>). Origin and peripheral distribution of brachial plexus branches. Causes of brachial plexus lesions. Anatomic basis of Erb's and Klumpke's palsy. Upper extremity nerves. Anatomical characteristics. Topography and distribution. Causes of impairment of upper extremity nerves. Anatomical basis and symptoms of lesions in <i>n. axillaris</i>, <i>n. musculocutaneus</i>, <i>n. medianus</i>, <i>n. ulnaris</i> and <i>n. radialis</i>. Anatomic basis of carpal tunnel syndrome.</p> <p>Practical work: Topographic anatomy of upper extremity with a focus on the pathway, relations and ramification of <i>n. axillaris</i>, <i>n. musculocutaneus</i>, <i>n. medianus</i>, <i>n. ulnaris</i> and <i>n. radialis</i></p>	<p>2</p> <p>2</p>
Day 5.	<p>Lecture: Lower extremity nerves. <i>Plexus lumbalis</i> and <i>plexus sacralis</i>. Anatomical characteristics. Topography and distribution. Causes of impairment of lower extremity nerves. Anatomic basis and symptoms of lesions of <i>n. gluteus superior</i> and <i>inferior</i>, <i>n. obturatorius</i>, <i>n. femoralis</i>, <i>n. ischiadicus</i> and its end branches (<i>n. tibialis</i> and <i>n. fibularis communis</i>). Nerves of thoracic and abdominopelvic walls. Innervation of thoracic and abdominopelvic cavity walls and its clinical significance. Surgical incisions and topography of nerves on anterior-lateral wall. Transferred pain and Head's zones</p> <p>Practical work: Topographic anatomy of lower extremity with a focus on the pathway, relations and ramification of <i>n. gluteus</i></p>	<p>2</p> <p>2</p>

	<i>superior and inferior, n. obturatorius, n. femoralis, n. ischiadicus</i> and its end branches (<i>n. tibialis</i> and <i>n. fibularis communis</i>) Partial exam 2	
Week 17-18.	Final exam (regular term)	
Week 19.-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0209	Course title: Clinical Anatomy of the Internal Organs		
Level: preclinical	Study year: I	Semester: II	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturers:	Professor Aida Hasanović MD PhD		
1. Overall aim	The overall aim of the Clinical Anatomy of the Internal Organs Course is to enable students to study specifically clinically-related aspects of internal organs and to provide instruction on all internal organs of the body in relation to the extent that clinical problems arise there.		
2. Course contents	<p>The following topics will be covered within the Modules:</p> <p>Module 1. Clinical anatomy of the thoracic organs Module 2. Clinical anatomy of the abdominal and pelvic organs Module 3. Clinical anatomy of the neck organs</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire knowledge necessary for understanding the topographical, functional, radiological and clinical anatomy of the internal organs of the neck.</p> <p>Through the lectures the students will gain following knowledge:</p> <ol style="list-style-type: none"> 1. Use the appropriate anatomical nomenclature to describe structures. Understand anatomical organization of the internal organs of the thoracic cavity 2. Describe the structure, normal patterns of arterial, venous and lymphatic vascularization, innervation and function of the digestive, urogenital and endocrine system with its clinical aspects/implication. 3. Understand anatomical organization of the neck region internal organs. Describe the arterial, venous and lymphatic vascularization and innervation of the neck region. <p>Through the practical work the students will acquire following skills:</p> <ul style="list-style-type: none"> - Recognize studied structures and organs in a cadaver, according to shape and topography, and relate this to knowledge gained from image and analysis techniques. - Recognize the major structures of the heart and mediastinum on CT images at two transverse levels in the thorax. - Describe the blood supply of the heart and clinical significance. 		

	<ul style="list-style-type: none"> - Point out the main features of the heart and great vessels in chest radiographs. - Recognize the topographical anatomy and the relations of the thoracic organs. - Identify the bronchopulmonary segment and indicate its clinical importance. - Identify the blood supply and the lymphatic drainage of the pleura and lung, identify lungs in chest radiographs. - Identify the parts of gastrointestinal tract in a radiograph after the contrast medium use and be able to recognize structure on a CT. - Locate and identify the abdominal and pelvic organs in a cadaver, and discuss the clinical importance. - Locate and identify the neck organs in a cadaver, and discuss the clinical importance. - Produce cross sections of portions on apparatus and system studied that have particular clinical relevance.
4. Teaching methods	<p>Lectures: 10 hours</p> <p>Practical work : 10 hours</p>
5. Method of knowledge assessment and examination	<p>Written tests in the form of Multiple choice questions (MCQ) tests</p> <p>Continuous knowledge and skills assessment will be carried out through practical work.</p>
Literature	<p>Recommended:</p> <ol style="list-style-type: none"> 1. Moore KL, Dalley AF. Clinically oriented anatomy. 5th ed. Lippincott Williams & Wilkins; 1999. 2. Drake RL, Vogl W, Mitchell AWM. Grey's Anatomy for Students. Elsevier Churchill Livingstone; 2005. 3. Waschke J. Paulsen F. Sobotta Atlas of Human Anatomy. 15th ed. Elsevier; 2012. <p>Additional:</p>

	<ol style="list-style-type: none"> 1. Hasanović A. Anatomija unutrašnjih organa. Sarajevo. Institut za naučno istraživački razvoj Kliničkog centra Univerziteta u Sarajevu; 2011. 2. Hasanović A, Žutić E. Anatomija prednjeg trbušnog zida U: Džanić Dž, Roth A. Mikroinvazivna kirurgija u ginekologiji. Bihać: Grafičar; 2010.
7.Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: anatomija@mf.unsa.ba</p>

COURSE PLAN: CLINICAL ANATOMY OF THE INTERNAL ORGANS

Day	Teaching methods and materials	Number of hours
Monday	<p>Lecture: Morphofunctional characteristics and topography of the heart. The clinical importance of the heart auscultation. The importance of the cardiac shadow in interpretation of the chest radiograph. Pericardium. Cardiac tamponade, pericardiocentesis. The clinical significance of the blood supply to the heart. Anatomic variations of the coronary arteries. Anastomoses. Atherosclerosis as a risk factor for coronary insufficiency. Ischemic heart disease. Importance of collateral circulation of the heart. Aortic aneurysm.</p>	2
	<p>Practical work: Congenital abnormalities of the heart and great vessels- anatomical and clinical importance. The fetal circulation. Anatomical methods for visualization of the heart and blood vessels (dissection and injection-corrosion). Methods in the diagnosis of ischemic heart disease-coronary angiography, echocardiography, myocardial perfusion scintigraphy</p>	2
Tuesday	<p>Lecture: Topographic relations of the larynx, trachea. The anatomical basis for tracheotomy. The lymphatic drainage of the trachea in lung cancer. Topography of the lungs and pleura. Projections. Costodiaphragmatic recess-clinical relevance. Pneumothorax. Bronchopulmonary segments, clinical importance. Blood supply and lymphatic drainage of the lung- anatomo-clinical aspects.</p>	2
	<p>Practical work: Topography of the bronchi. Visualization techniques: bronchoscopy, bronchography, chest X-ray. Anatomy of mediastinum and diaphragm -clinical relevance. Visualization techniques of the chest organs- chest radiographs, CT images, MRI.</p>	2
Wednesday	<p>Lecture: Digestive system. Clinical relevance of the organs (the abdominal part of the oesophagus, stomach, small intestine, large intestine). Gastroscopy in diagnosis of gastric ulcer. Liver segmentation - clinical relevance. Topography of the pancreas. Imaging methods of stomach, intestine and pancreas (echo and endoscopic methods, CT image and MRI). Clinical aspects of the duodenum, pancreas, liver, spleen. The relationship of the costodiaphragmatic recess of the pleural cavity to the spleen, splenomegaly, splenectomy.</p>	2
	<p>Practical work: Digestive system. Clinical aspects of porto-caval anastomoses.</p> <p>Partial exam 1</p>	2
Thursday	<p>Lecture: Topographic and microscopic anatomy of the kidneys.</p>	2

	<p>Nephroptosis. Paraneoplastic process. Blood supply to the kidneys. Anatomical variations of the renal arteries. Renal hypertension. Kidney transplantation. Topography and structure of the female reproductive organs (ovary, uterine tube). The clinical aspects of ectopic pregnancy. Hysterosalpingography and laparoscopy. The topographical relations of the uterus. The position of the uterus. Ligaments. Clinical importance in obstetrics.</p> <p>Practical work: Clinical anatomy of the urinary system (ureters, urinary bladder, urethra). Anatomical variations of the ureters. Renal colic. Radiological examination of the urinary tract (arteriography, retrograde pyelography). The topographical relations of the vagina. Vaginal fornix-clinical importance. Clinical anatomy of the female external genitalia (vulva). Visualization techniques of the female internal genital organs. Pelvis and perineum. Blood supply and lymphatic drainage of the pelvis -. clinical significance. Mechanism of labour. Episiotomy.</p>	2
Friday	<p>Lecture: Topographical anatomy of the male genital organs (testis, scrotum, epididymis, ductus deferens). Inguinal canal. Testicular descent. Cryptorchidism. Hydrocele testis. Hematocele. Clinical significance of blood supply of the testis. Spermatic cord.. Clinical anatomy of the endocrine system. The relationship of the thyroid gland to the recurrent laryngeal nerve. Parathyroid glands. Skin and its derivatives. Clinical importance of vascularization, innervation and lymphatic drainage of the breast.</p> <p>Practical work: The topographical relations of the prostate. Benign prostatic hypertrophy. Prostate cancer. Clinical aspects of vascularization, innervation and lymphatic drainage of the penis. Phimosis.</p> <p>Partial exam 2</p>	2
Week 17-18.	Final exam (MCQ) (regular term)	
Week 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0210	Course title: HEALTH EDUCATION		
Level: preclinical	Study year: I	Semester: II	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	None		
Lecturers: Professor Amela Džubur-Alić Md PhD			
1. Overall aim	The course aims to help students to acquire basic knowledge about the possibilities of health-educational activities of health professionals and non-medical staff in the community.		
2. Course contents	<p>Through the teaching of the subject "Health education 1" student will acquire the following knowledge:</p> <p>Modul. 1. Health education, definitions, principles and objectives of the work</p> <p>The aim of this module is to understand the health education as a part of social medicine, its understanding and importance in the practice of a doctor.</p> <p>Modul 2. The field of activities of health education</p> <p>The aim of this module is to familiarize with the orientation of the activities of health education, the ways of assessing the needs for health education and health education personnel.</p> <p>Modul 3. The methods and tools in health education</p> <p>The goal of the module is to familiarize with the means and methods applied in the health-educational work.</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Students will acquire health education approach in the work of medical doctors and understand health education as part of social medicine.</p> <p>Students will learn about the orientation of action of health education, ways to assess the needs for health-educational work and staff in health education.</p> <p>Students will learn about the means and methods to be applied in health-educational work. .</p> <p><i>Through the lectures and seminars the students will gain following knowledge and competences:</i></p> <p>1. Ussing health education in the work of medical doctors</p> <p>2. Appropriate usage of means and methods in health education</p> <p><i>Through the practical work students will acquire following skills:</i></p> <ul style="list-style-type: none">– Observation of risky behavior and recognition of the need for health– Exemining lifestyle– Defining staff in health education– Assessment of needs for health education		

	<ul style="list-style-type: none"> – Defining methods in concrete situations – The creation and use of health-educational resources
4. Teaching methods	<p>Lectures 8 hours</p> <p>Seminars: 2 hours</p> <p>Practical work: 10 hours</p>
5. Method of knowledge assessment and examination	<p>By actively engaging in lectures, including making a presentation of a seminar, student can win a maximum of 20 points and, a minimum of 10 points.</p> <p>On the first partial exam, the student can win a maximum of 40 and, a minimum of 23 points.</p> <p>On the second partial exam, the student can win a maximum of 40 and, a minimum of 22 points.</p> <p>Part-time examinations will be carried out to assess the theoretical and practical part of MCQ and essay questions.</p> <p>If the student did not pass one of the partial exam, he / she would take that partial exam in the final exam.</p> <p>If a student has not passed any of the partial exams, the final examination will be the integral exam. The student can win a maximum of 80 and a minimum of 45 points on the integral exam.</p>
6. Literature	<p>Obligatory:</p> <ul style="list-style-type: none"> – Barbara K. Rimer, K. Viswanath Health Behavior and Health Education Theory, Research, and Practice, 4th Edition, Jossey-Bass
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on the Department's notice-board and on faculty website. Pre-agreed consultations are obligatory, and can be scheduled with the Department's secretary or via e-mail: socijalna.medicina@mf.unsa.ba</p>

COURSE PLAN: HEALTH EDUACTION

Week	Form of teaching	Number of hours
Week 1.	Lecture: Definition and goals of health education	1
Week 2.	Lecture: Requirements and needs for health education	1
Week 3.	Practical classes: The most common requirements and needs for health education in individual population groups, vulnerable groups	1
Week 4.	Lecture: Preventive-promotional programs	1
Week 5.	Practical classes: Development of risk prevention program, definition of health care program, characteristics of preventive programs	2
Week 6	Lecture: Specific areas in health education	2
Week 7.	Partial exam 1	1
Week 8.	Lecture: Definition and types of methods for working in health education, organizational methods of work in health education, advantages and disadvantages of particular methods	2
Week 9	Practical classes: Preparation of health education lectures	1
Week 10.	Practical classes: Health education work in the group, group definition, specificity of work in large and small groups, health education interview	2
Week 11	Lecture: Definition and classification of health education resources	2
Week 12	Practical classes: Health education exhibit, definition, principles of making a health education exhibit	1
Week 13	Practical classes: Brochure as a means of health education, makin of a brochure	1
Week 14	Practical classes: Poster as a means of health education, poster characteristics and making of a poster	1
Week 15	Partial exam 2	1
Week 17-18	Final exam (regular term)	
Week 19-20.	Final exam (make-up examination term)	
September	Final exam (September term)	

Code: MFSE 0211	Course title: Selected Instrumental Methods of Chemical Analysis in Medical Practice		
Level: preclinical	Study year: I	Semester: II	ECTS: 1
Status: elective	Total contact hours: 20		
Prerequisites:	According to the Study Regulation		
Lecturer:	Associated professor Amira Čopra-Janicijevic MSc		
1. Overall aim	The overall aim of Selected Instrumental Methods of Chemical Analysis in Medical Practice Course is to introduce students to the basic physical laws that apply in the instrumental methods. They will develop new analytical methods, to use them in clinical chemistry.		
2. Course contents	<p>The following topics will be covered within the Modules:</p> <p>Module 1. Spectroscopic methods Module 2. Electrochemical methods Module 3. Separation techniques</p>		
3. Learning outcomes (Knowledge, skills and competences)	<p>Student will acquire knowledge necessary for classification and explanation of various analytical methods (qualitative and quantitative) in clinical and laboratory medicine.</p> <p><i>Through the lectures the students will gain following knowledge and competences:</i></p> <ol style="list-style-type: none"> 1. Know interaction between mass and energy of radiation, as well as their practical use in chemical analysis. 2. Learn theoretical bases of electrical property of substances: redox reactions, electric potential, electrochemical cell as well as their practical use in chemical analysis. 3. Discover bases of separation and components identification of complex system (phenomena of diversity and adsorption). <p><i>Through the laboratory work students will acquire following skills:</i></p> <ul style="list-style-type: none"> - Proper sampling - Sample preparation (dilution) - Preparation of standard solutions for the qualitative and quantitative analysis - Instrument calibration - Keeping a laboratory notebook - Interpretation of the results 		

4. Teaching methods	<p>Leactures: 10 hours</p> <p>Practical work: 10 hours</p>
5. Method of knowledge assessment and examination	<p>Written tests in the form of – Multiple choice questions (MCQ) tests and Extended response questions (ERQ) tests</p> <p>Continuous knowledge and skills assessment will be carried out through Partial exams and Practical Laboratory Colloquium.</p>
6. Literature	<p>Recommended:</p> <ul style="list-style-type: none"> – Michael L, Bishop, Edward P. Fody, Schoeff LE. Clinical Chemistry: Principles, Techinques, and Correlations, 7th edition. Lippincott Williams & Wilkins; 2013. <p>Additional:</p> <ul style="list-style-type: none"> – Caroli S, Zàray G. Analytical Techniques for Clinical Chemistry. Methods and Applications, Willey; 2012. – Werner M. CRC Handbook of Clinical Chemistry. Taylor & Francis; 1989.
7. Remarks	<p>Student office hours are published in a separate schedule which can be found on faculty website. Pre-agreed consultations are obligatory, and can be scheduled via e-mail: studentska.sluzba@mf.unsa.ba</p>

COURSE PLAN: SELECTED INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS IN MEDICAL PRACTICE

Weeks	Teaching methods and materials	Number of classes
Week 1	Lectures: Spectroscopic methods. Refractometry. Polarimetry. Physical laws. The basic terms of instrumental methodology.	1
Week 2	Practice: Determining specific angle of rotation of polarized light.	1
Week 3	Lectures: Absorption of radiation in UV and VIS part of the spectrum (the source of radiation optic filters and monochromator detectors).	1
Week 4	Lectures: Colorimetry and Spectrophotometry	1
Week 5	Practice: Spectrophotometric determination of ionization constants of indicators.	2
Week 6.	Lectures: Flame photometry and atomic absorption spectrophotometry (AAS). Basic principles and instruments	1
Week 7	Lectures: Turbidimetry and nephelometry. Fluorimetry. Basic principles and instruments	1
Week 8	Lectures: Electrochemical methods. Potentiometry (diffuse potential, redox potential, membrane potential). Electrode.	1
Week 9	Practice: Potentiometric determination of the equivalence point in the neutralization reaction. (Strong Acid + Strong Base)	2
Week 10	Lectures: Conductimetry. Conductometric determination of cell.	1
Week 11	Practice: Conductometric determination of conductivity of a strong electrolyte.	2
Week 12	Lectures: Separation methods (principles). Chromatography. Chromatography separation in accordance with performance (thin layer, liquid and gas). Chromatographies separation in accordance with Physicochemical Methods.	2
Week 13	Lectures: Electrophoretic determination of amino acids by paper.	2
Week 14	Examining the knowledge of the practical work of the exam	1
Week 15	Partial exam	1
Week 17-18	Final exam (regular term)	
Week 19-20	Final exam (make-up examination term)	
September	Final exam (September term)	