



**SYLLABI OF THE  
INTEGRATED UNIVERSITY STUDY PROGRAM  
MEDICAL STUDIES IN ENGLISH  
FOR THE ACADEMIC YEAR 2024./2025.**

Mostar, September 2024

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	I		
Course title	MEDICAL PHYSICS AND BIOPHYSICS	Course code	MFMSE101		
ECTS	5.5	Status	Obligatory		
Teaching hours		Lectures	Exercises	Seminars	Practice
		24	20	16	0
Teachers	Prof. Marija Raguž, PhD	24	0	16	
	Assist. Prof. Stipe Galić	0	4	0	
	Ivan Lasić, assist.	0	16	0	
Course objectives	<ul style="list-style-type: none"> <li>- to provide the students with knowledge regarding the basics of atomic physics and basic physical phenomena and laws.</li> <li>- to achieve theoretical knowledge that is necessary as a prerequisite for understanding the basics of nuclear physics, nuclear medicine, radiological physics, magnetic resonance imaging and ultrasound physics.</li> <li>- to provide student with the understanding of biotransport, membrane and action potential, physics of the ear and hearing, physics of the eye and vision, and measurement of the potentials on the surface of the body.</li> <li>- to provide students with understanding of the work of the human body: the deformation of a solid body (elastic and plastic deformation) and the representation of the musculoskeletal system as a system of levers.</li> <li>- to achieve understanding of the work of the heart and circulation and the physics of the lungs and breathing.</li> </ul>				
Course learning outcomes	Learning outcome (LO) Student:		Course learning outcome code	LO code at the study program level	
	- Describes and explains the physical basics necessary for understanding the application of physical laws in biological systems and the basics of biological processes at the molecular level		IU-MFMSE101-1	IU-MSE1 IU-MSE7	
	- Describes and explains physical quantities and units used in biophysics		IU-MFMSE101-2	IU-MSE1 IU-MSE3	
	- Explains the basic concepts of mechanics and hydromechanics and applies them to the human body		IU-MFMSE101-3	IU-MSE1 IU-MSE3	
	- Explains and defines the basic terms and laws of thermodynamics and uses them to explain the behavior of the human body as a thermodynamic system		IU-MFMSE101-4	IU-MSE1 IU-MSE3	
	- Applies the basic concepts of electromagnetism and thermodynamics in order to explain nerve signal transmission		IU-MFMSE101-5	IU-MSE1 IU-MSE3	
	- Describes and explains the mechanisms of interaction between ionizing radiation and substances, the effects that ionizing radiation can cause in humans, and recognizes the importance and scope of work of dosimetry and define doses		IU-MFMSE101-6	IU-MSE1 IU-MSE7	
	- Explains the laws of optics and applies them to the propagation and nature of light, the creation of an image in the eye, and optical devices and the correction of optical errors of the eye using glasses		IU-MFMSE101-7	IU-MSE1 IU-MSE7	
	- Defines and explains vibration of mechanical systems and applies it to the description of sound waves and explains the connection between acoustic parameters and physiological sensations of sound waves		IU-MFMSE101-8	IU-MSE1 IU-MSE7	
- Distinguishes radiograms from scintigrams, echograms and images obtained by magnetic resonance or computerized tomography, and recognizes what these basic imaging methods of medical diagnostics represent and what they are for		IU-MFMSE101-9	IU-MSE1 IU-MSE7		
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar				

Course content	Week / shift		Topic				
	Lectures		(L1) Introduction. Basics of nuclear physics (L2) Radiation and matter (L3) Physical basis of nuclear medicine (L4) Physics of diagnostic radiology (L5) Physics of MR imaging (L6) Ultrasound physics (L7) Biotransports, membrane potential (L8) Action potential (L9) Biophysics of senses, ear and hearing (L10) Biophysics of the eye and vision (L11) Biomechanics of tissues (L12) Body biomechanics (L13) Haemoreology 1 (L14) Haemoreology 2				
	Seminars		(S1) Recapitulation seminar 1: L1-L3 (S2) Recapitulation seminar 2: L4-L6 (S3) Comparison of diagnostic methods (S4) Potentials on the surface of the body (S5) Recapitulation seminar 3: L7-L8 (S6) Recapitulation seminar 4: L9-L10 (S7) Recapitulation seminar 5: L11-L12 (S8) Recapitulation seminar 6: L13-L14				
Exercises		(E1) Introduction to cyclic exercises. Overview. Statistics. (E2) Cyclic exercises C1 – C6 (E3) Cyclic exercises C1 – C6 (E4) Cyclic exercises C1 – C6 (E5) Cyclic exercises C1 – C6 (E6) Cyclic exercises C1 – C6 (E7) Cyclic exercises C1 – C6 (E8) Radioactivity and Radiation Protection (E9) Computer Tomography, External Beam Radiotherapy (E10) Practical exam  C1: Microscopy C2: Periodic Signal Analysis C3: Electric Circuit C4: Viscosity C5: Surface Tension C6: Air Humidity					
Language	English						
E-learning	Classes are taken in person. If necessary, lectures, seminars and part of the exercises can take place combined (live and online) or completely online via e-learning platforms (Google-Meet) up to max 20 %.						
Teaching methods	Teaching, interactive and active-experiential						
Types of assessment (indicate - <b>Bold</b> )							
Type of pre-examination obligation					Type of exam		
midterm	seminar paper	essay/report	practical/project task	<b>other</b>	<b>written exam</b>	oral exam	<b>practical</b>
Allocation of ECTS credits and share in the grade							
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade		
Attending classes			60	2			
Students' activity during interactive seminars			30	1	20% - in pre-exam term		
Pre-exam/Practical exam		IU-MFMSE101-2 IU-MFMSE101-3 IU-MFMSE101-4 IU-MFMSE101-6	30	1	10% - in pre-exam term		

	IU-MFMSE101-9			
Pre-exam/Written exam	IU-MFMSE101-1 IU-MFMSE101-2 IU-MFMSE101-3 IU-MFMSE101-4 IU-MFMSE101-5 IU-MFMSE101-6 IU-MFMSE101-7 IU-MFMSE101-8 IU-MFMSE101-9	45	1.5	70% - in pre-exam term 100% - all other terms
In total		165	5.5	100%

#### Method of calculating the final grade

Students have to pass the written exam (in form of a test, comprised of 60 questions, each containing 5 statements: 4 false and 1 true). The threshold for the written exam is 33 points. Number of total bonus points awarded during seminars and practical exam will be added to the written exam score if a student passes the threshold for the written exam of 33 points. Bonus points are valid only for the first exam term. According to the Rulebook on Studying final grade is obtained as follows:

A = 91-100% 5

B = 79 to 90% 4

C = 67 to 78% 3

D = 55 to 66% 2

F = 0 to 54% 1

Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	1. Eterović D.: Physics of diagnostic imaging for medical students, Zagreb, 2002.		*		*					*	
	2. Eterović D.: Biophysical grounds of physiology; script materials		*		*					*	
	3. Eterović D. et. al.: Laboratory exercises - Medical physics and biophysics		*		*					*	
Additional	1. JA Pope: Medical Physics (second edition); Heinemann, 1989.		*		*			*			

#### Additional course information

##### Students' obligations:

Students have to attend all course lectures, seminars and exercises. Up to 20% of justified absence from seminars and lectures can be tolerated. Students are expected to participate actively during the course.

##### Types of seminars:

First type is described in the course curriculum by a name of the topic to be covered. The names in the curriculum correspond to the chapter titles in the literature. Seminars are interactive. The teacher explains the topic at hand and can pose questions to the students in order to assess their current knowledge. Students are expected to prepare the content of corresponding seminars in advance.

Second type of seminar is a recapitulation seminar. The goal of this type of seminar is to address the most common issues regarding the topics covered during few previous lectures and seminars. The student's positive response at recapitulation seminar will be awarded with a bonus point. Only one bonus point per seminar can be obtained by one student. Number of possible bonus points at seminars is 6.

##### Types of exercises:

Introduction exercise term includes explanation of mathematical functions and statistical methods required to analyze data collected during cyclic exercises.

First exercise type - cyclic exercises (C1-C6) include six different laboratory exercises. Students are expected to prepare the content of corresponding exercise in advance. The teaching material will be posted on the students' platform (SUMARUM). At the beginning of exercises the teacher will check whether the students are ready to perform the exercise through a short conversation. During exercise the students will make measurements. They are supposed to analyze data at home and present their reports during next exercise term. The teacher will review the results and make comments if mistakes were made during collecting data or calculation. If student does not bring or present unsatisfactory report he/she will be obligated to repeat that exercise during additional exercise term that will be organized at the end of classes. Student can repeat exercise only once. If a student doesn't appear for any of exercises he/she will have to take an additional exercise term. All students who miss one exercise term will be obliged to take it.

Second exercise type will be organized in the hospital. The goal is to familiarize students with the physical methods and instrumentation used in the hospital in order to obtain detailed diagnostic information and achieve useful therapeutic effects. After completing all the exercises, students are obligated to take practical exam related to the exercises. Students will be awarded with a bonus point during practical exam. Number of minimal bonus points that student should obtain during practical exam in order to qualify to take written exam is 2. Maximal number of bonus points that student can achieve during practical exam is 5.

Attending all exercises is mandatory. Students are strongly advised to participate actively during the course. Practical exam will be related to exercises during course.

**Exam:**

Students have to pass the written exam (in form of a test, comprised of 60 questions, each containing 5 statements: 4 false and 1 true). The threshold for the written exam is 33 points. Number of total bonus points awarded during seminars and practical exam will be added to the written exam score if a student passes the threshold for the written exam of 33 points. Bonus points are valid only for the first exam term.

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	I		
Course title	MEDICAL BIOLOGY	Course code	MFMSE102		
ECTS	9.5	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		45	30	35	0
Teachers	dr.sc. Katarina Vukojević, prof.	13	0	7	0
	dr. sc. Sandra Kostić, prof.	12	0	7	0
	dr. sc. Snježana Mardešić, prof	10	0	7	0
	dr. sc. Violeta Šoljić, prof	10	0	7	0
	dr. Maja Barbarić, viši asistent	0	15	7	0
	Martina Vukoja, asistent	0	15	0	0
Course objectives	<p>The objectives of the Medical Biology course are making an introduction for students to the basic principles of modern biological science which is of high importance for the diagnosis and therapy of human diseases, and the future of medicine. During this course, students should acquire terminology necessary for understanding of modern biomedical literature. The students will learn basic cell biology, molecular biology, developmental biology with an emphasis on human biology. They will be actively involved in problem-orientated work, organized in the form of blended lectures, seminars and exercises in order to develop practical communication skills and understanding of fundamental biological processes, as well as critical thinking based on acquired knowledge in modern biological science.</p>				
Course learning outcomes	Learning outcome (LO) Student:	Course learning outcome code	LO code at the study program level		
	Describes and explains the basic structure and function of cells (macromolecules, cytoskeleton, transport of macromolecules, organelles, mitochondria and energy production, cell cycle, cell signaling and tumor biology)	IU-MFMSE102-1	IU-MSE1		
	Describes and explains the basics of molecular cell biology (cell genome, replication and repair of DNA, transcription and RNA species, regulation of transcription, RNA modification, translation, regulation of translation, synthesis and modification of proteins, transport and function of proteins)	IU-MFMSE102-2	IU-MSE2 IU-MSE21		
	Distinguishes the principles of the basics of developmental biology (fertilization, meiosis, mitosis, stem cells and the molecular mechanisms of cell differentiation)	IU-MFMSE102-3	IU-MSE3		
	Distinguishes the medical human genetics (basic principles of genetic inheritance, sexual and autosomal inheritance, chromosome aberrations, genetic counseling)	IU-MFMSE102-4	IU-MSE4		
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.				
Course content	Week / shift	Topic			
	Lectures	L1 – Cell -evolution prokaryotes vs. eukaryotes, cell compartments, inner membrane, cytoplasm L2 - cell structure, the cell chemistry, macromolecules, enzymes L3 - Cell membrane L4 - Nucleic Acids, gens, eukaryotic organisms, DNA L5 - Nucleus, transport, organization, nucleolus L6 – cytoskelet - microfilaments, intermediar filaments, microtubules L7 - extracellular matrix and organization, cell surface, cellular interactions L8 - Cell research methods and microscopy			

		L9 - Introduction to molecular biology - DNA replication and telomeres L10 - maintenance and DNA recombination, DNA repair L11 - synthesis and RNA transcription, transcription factors L12 - synthesis and RNA transcription, RNA trafficking L13 - genomic DNA, recombination L14 - synthesis of proteins, translation, protein sorting and transport L15 - Bioenergetics and metabolism, mitochondria and peroxisomes L16 - transport and protein sorting - ER, Golgi apparatus L17 - protein transport - vesicular transport, lysosome L18 - Cell signaling - signal molecules and action of cell surface receptors L19 - Cell signaling - intracellular signal transduction, cytoskeleton and signaling network L20 - cell cycle - cell cycle checkpoints, cell cycle regulation, mitosis and meiosis L21 - Meiosis L22 - Programed cell death L23 - Stem cells L24 - Cancer - development and causes, tumor viruses, oncogenes					
	Seminars	S1 - cell structure, the cell chemistry, macromolecules, enzymes S2 - cell membrane - micro and macro molecules transport S3 - Nucleus, DNA S4 - extracellular matrix and cytoskeleton S5 - DNA analysis S6 - protein analysis S7 - cell genome, DNA replication S8 - transcription, transcription regulation, transport and processing of RNA S9 - translation and translational regulation S10 - ER and Golgi apparatus S11 - Bioenergetics and metabolism, mitochondria and peroxisomes S12 - Cell signaling S13 - cell cycle S14 - Stem cells and programed cell death S15 - Cancer S16 - repetition and knowledge testing					
	Tutorials	E1 (10 hours) - DNA analysis E2 (4 hours) - Methods of cell investigation. Microscope and microscopy 1 E3 (4 hours) - Methods of cell investigation. Microscope and microscopy 1 E4 (2 hours) - Repetition. Microscope and microscopy E5 (10 hours) - Protein analysis					
Language	English						
E-learning	Up to 20% (lectures).						
Teaching methods	Teaching, interactive and active-experiential.						
<b>Types of assessment (indicate - Bold)</b>							
Type of pre-examination obligation					Type of exam		
midterm	<b>seminar paper</b>	essay/ report	practical/project task	other	<b>written exam</b>	oral exam	practical
<b>Allocation of ECTS credits and share in the grade</b>							
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade		
Class attendance			110	3,6			
Seminar paper and work		IU- MFMSE102-1 IU- MFMSE102-2 IU- MFMSE102-3 IU- MFMSE102-4	45	1,5	20%		
Pre-exam/Written exam		IU- MFMSE102-1 IU- MFMSE102-2 IU- MFMSE102-3 IU- MFMSE102-4	130	4,4	80%		
In total			285	9,5	100%		

**Method of calculating the final grade**

The final grade is obtained as a weighting of the grades from the seminar assignment (20% of the grade) and the written exam (80% of the grade). A detailed description is given in the additional course information.

Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	Cooper GM, Hausman RE. The Cell, a Molecular Approach. 8th ed. Washington DC, Sunderland (Massachussets): ASM Press, Sinauer Associate		x		x			x			
	Cox TM, Sinclair J. Molecular biology in medicine. Blackwell Science, 1997. Oxford, UK (5th and 17th chapter)										
Additional	Alberts B et. all. Essential Cell Biology, New York, Garland Science,3/e, 2009		x		x			x			
	Turnpenny P, Ellard S. Emery's Elements of Medical Genetics. 14th edition, Elsevier Churchill Livingstone, Edinburgh 2011.										

**Additional course information**

**Further explanation:** The course of Medical biology is performed during the first semester in the form of lectures (45 hours), seminars (35 hours) and exercises (30 hours). All forms of education are obligatory, and the participation of students will be monitored regularly.

The teacher evaluates the student's participation in the seminar (demonstrated knowledge, understanding, ability to define problems and reasoning).

**Seminars** consist of seminar work and quizzes. For seminar work each student will get their own topic and presentation will be graded from 1-5. This mark will be evaluated as 10% of grade. All 16 seminars will finish with quiz (10 question per seminar). Maximal number of points can be 160 (16 seminars). These points will be evaluated as 10% of final grade according to the key: 91 – 110 – pass; 111 – 120 – good; 121 – 140 – very good; 141 - 160 – excellent.

Written test consists of 80 questions; 55 percent is necessary to pass (44 points). Written test will be evaluated as 80% of final grade.

44-52 – sufficient

53-62 – good

63-71 – very good

72-80 – excellent

**Final mark:** seminar work (10% of grade) + seminar quizzes (10% of grade) + written exam (80 % of grade).



Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	I		
Course title	INTRODUCTION TO MEDICINE AND HISTORY OF MEDICINE	Course code	MFMSE103		
ECTS	4	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		44	15	31	-
Teachers	dr.sc. Miro Leventić doc				
	dr.sc. Josip Mišković prof	4		4	
	dr.sc Danijel Pravdić,prof	3		2	
	dr.sc. Nikolina Pravdić,prof	3			
	dr.sc. Nataša Pejanović ,prof	2	2	2	
	dr.sc. Josip Lesko,doc	3	2	2	
	dr.sc.Marijana Jerković Raguž prof	3	2	2	
	dr.sc. Boris Lukšić, prof	3	2	2	
	dr.sc Davor Štimac,prof	6		4	
	dr.med Emil Babić ,vass	3	2	2	
	dr.sc. Darko Duplančić,prof	9	4	6	
	dr.sc Sandra Kostić,prof	3		2	
dr.sc.Josip Grubeša,prof	2	1	3		
Course objectives	<p>To acquaint medical students with:</p> <ul style="list-style-type: none"> <li>- studying at the Faculty of Medicine,</li> <li>- the development of medicine throughout history,</li> <li>- the role of doctors in the health system and in society.</li> </ul> <p>Also, the aim is to analyze the definition of health and health system in a narrower and wider environment and through the basics of Latin to create a foundation for learning unique medical terminology.</p>				
Course learning outcomes	Learning outcome (LO) Student:		Course learning outcome code	LO code at the study program level	
	Plans independent learning through studies in a way of critical and self-critical questioning of scientific truths.		IU-MFMSE103-1	IU-MSE7 IU-MSE12 IU-MSE21	
	Describes the development of medical thought and practice through the history of different cultures.		IU-MFMSE103-2	IU-MSE9	
	Correctly values scientific achievements in the development of medicine.		IU-MFMSE103-3	IU-MSE7	
	Demonstrates possession of personality qualities (team work and personal contribution, active listening and building positive relationships with group members).		IU-MFMSE103-4	IU-MSE9	
	Explains the importance of preventive and curative medicine.		IU-MFMSE103-5	IU-MSE9 IU-MSE10 IU-MSE11	
	Describes and explains first aid procedures.		IU-MFMSE103-6	IU-MSE11 IU-MSE21	
	Forms regular and irregular morphological forms according to the declinational and conjugation system (Latin).		IU-MFMSE103-7	IU-MSE16 IU-MSE21	

Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.		
Course content	Week / shift	Topic	
	Lectures	What is the medicine? Study of medicine, division of medicine and the role of the doctor	
		The main health problems in FBiH (in terms of organization of health care and health insurance)	
		The clinical requiring of basic resuscitation procedures and sensitivity of brain cells to stop circulation (hypoxia)	
		Recognizing obstruction of upper airway and corrective actions	
		Latin	
		Access to health care in pediatrics. The most common health problems in pediatrics.	
		Acute poisoning and first aid (identification and elimination of toxins from the body, antidotal and symptomatic therapy the most common poisoning, poisoning plants)	
		Medical Sociology, Health behavior: positive promotion and illness.	
		Medical Sociology: Theory of stress and social support. The main forms of social anomie. Career patients	
		Historical development of nursing. Definitions and theories of health care. Basic human needs and their relation to health care. The nurse as a person, professional, ethical and moral issues. Basic skills assessment the patient's condition.	
		Basic revival procedures and subsequent resuscitation methods	
		Recognition of cardiac arrest on the monitor and ECG difference	
		The historical turning point medicine. Basics of scientific medicine.	
		Looking back in history of medicine. Birth of modern medicine.	
		Introduction to medical care	
		Seminars	What is the health (WHO definition), how to preserve it and improve it?
			Social-economic development and health
			Hypoxia and consequences
	Obstruction of upper airway - first aid		
	Word formation - morphology of medical terms		
	Combining forms: body parts and tissues		
	Cardiopulmonary resuscitation of the newborn.		
	Acute poisoning and first aid		
	Theoretical approaches to the relationship doctor-patient.		
	The task of the medical profession in the past and today. The way to a medical profession		
	Prevention of infection, the conditions essential for the development of infection		
	The difference between the percentage of oxygen that patient gets from exhaled mixture of the air of rescuers and the application of mechanical ventilation		
	ECG normal curve and ventricular fibrillation, total atrioventricular block and electromechanical dissociation		
	Psychological Medicine and its importance in the everyday activities of doctors		
	Exercises		Health care education
		What is the disease, how to prevent it and treat its effects	
		Basic resuscitation procedures	
Obstruction of upper airway - first aid Terms pertaining to the body as a whole: 1. structural organization of the body; 2. body cavities; 3. abdominopelvic quadrants and regions; 4. anatomical division of the back;			

		5. positional and directional terms; 6. planes of the body									
		The procedure with a child in convulsions									
		Acute poisoning and first aid									
		Mastering basic skills of nurturing patients, patients personal hygiene and hygiene of its environment, care for comfort									
		ECG									
		Psychological Medicine									
Language	English										
E-learning	Classes are conducted live. If necessary, lectures and seminars can be held combined (live and online) or completely online via e-learning platforms (Google Meet) up to a maximum of 20%.										
Teaching methods	Teaching, interactive and active experiential.										
<b>Types of assessment (indicate - <b>Bold</b>)</b>											
Type of pre-examination obligation						Type of exam					
<b>midterm</b>	seminar paper	essay/report	practical/project task	other	<b>written exam</b>	<b>oral exam</b>	practical				
<b>Allocation of ECTS credits and share in the grade</b>											
Student obligations		Learning outcome code		Hours of workload		Share in ECTS		Share in grade			
Attending classes with engagement		IU-MFMSE103-4		90		3		0%			
Pre-exam/Written exam		IU-MFMSE103-1 IU-MFMSE103-2 IU-MFMSE103-3 IU-MFMSE103-5 IU-MFMSE103-6 IU-MFMSE103-7		30		1		100%			
In total				120		4		100%			
<b>Method of calculating the final grade</b>											
The exam is <u>written</u> .											
All those who have not missed classes have the right to take the tests. Also, the tests can be taken by those who passed the teaching units during which they were not in class or in which they did not demonstrate sufficient knowledge.											
At the end of the class in a pre-exam term and all subsequent terms the test will include material from introduction to medicine, medical sociology, first aid, health care and history of medicine in the form of an integrated test and a special exam in Latin.											
According to the Rulebook on Studying final grade is obtained as follows:											
A = 91-100% 5											
B = 79 to 90% 4											
C = 67 to 78% 3											
D = 55 to 66% 2											
F = 0 to 54% 1											
Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	Detels R, Beaglehole R, Lansang MA, Gulliford M editors. Oxford Textbook of Public Health, 5th ed. Oxford University Press, New York 2011.		X		X			X			
	Porter R. The Greatest Benefit to Mankind: A Medical History of Humanity. Fontana Press; 1999. (Chapters II, III, V, VIII, IX, X and XI)		X		X			X			

	Jerry P. Nolana,*, Jasmeet Soarb, David A. Zidemanc, Dominique Biarentd, Leo L. Bossaerte, Charles Deakin, Rudolph W. Kosterg, Jonathan Wyllieh, Bernd Böttigeri, on behalf of the ERC Guidelines Writing Group: European Resuscitation Council Guidelines for Resuscitation 2015. Resuscitation 81 (2015)		X		X						
	Handouts and Dorland's Illustrated Medical Dictionary, Saunders		X		X						X
Additional	Additional literature will be assigned individually during the seminar preparations according to the seminar theme.										
Additional course information											

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	I		
Course title	SCIENTIFIC METHODOLOGY	Course code	MFMSE104		
ECTS	7	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		24	46	30	-
Teachers	Prof. Renata Pecotić, MD, PhD	6	8	2	
	Prof. Zoran Đogaš, MD, PhD, full attended	6	4	2	
	Prof. Maja Valić, MD, PhD, full attended	6	2	2	
	Assoc. Prof. Ivana Pavlinac Dodig, MD, PhD	6	8	6	
	Assoc. Prof. Josip Lesko, MD, PhD		2	2	
	Assoc. Prof. Linda Lušić Kalcina, PhD		6	4	
	Katarina Madirazza, PhD, senior assistant		8	6	
	Sijana Demirović, MD, assistant		8	6	
Course objectives	<p>The aim of the course is to enable students to acquire knowledge and skills necessary for the following:</p> <ul style="list-style-type: none"> <li>- performing the study and presenting the results of the research thesis by applying the fundamental postulates of science and information technology;</li> <li>- learning (especially permanent medical education i.e. lifelong learning) using the results of scientific research studies.</li> </ul> <p>Additional aim is to enable that all students, future physicians, recognize and utilize the following during later years of study:</p> <ul style="list-style-type: none"> <li>- evidence-based medical information (information)</li> <li>- continuous development of the scientific way of thinking and the use of scientific principles in studying various subjects of preclinical and clinical medicine</li> <li>- the role and the tasks of physicians in the health care team using basic scientific principles in the development and improvement of diagnosis of disease and treatment of patients</li> <li>- presenting the results of professional and research work using IT technology</li> <li>- learning (especially in the field of permanent medical training) using computer networks (the Internet).</li> </ul>				
Course learning outcomes	Learning outcome (LO) Student:		Course learning outcome code	LO code at the study program level	
	Explains, differentiates and interprets types of research in medicine.		IU-MFMSE104-1	IU-MSE1	
	Designs, organizes and conducts scientific research based on the postulates of responsible and objective science and teamwork.		IU-MFMSE104-2	IU-MSE9	
	Collects, distinguishes and classifies types of data in medicine.		IU-MFMSE104-3	IU-MSE7	
	Interprets the foundations of statistical inference and chooses a suitable statistical test.		IU-MFMSE104-4	IU-MSE7	
	Writes, evaluates, revises and presents a scientific paper.		IU-MFMSE104-5	IU-MSE7	
	Reviews the strategy for searching and evaluating medical literature and information, presents and applies them in appropriate manner.		IU-MFMSE104-6	IU-MSE19 IU-MSE20 IU-MSE21	

Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.	
Course content	Week / shift	Topic
	Lectures	<p>L1. Medicine is science - an introductory lecture</p> <p>L2. Scientific research</p> <p>L3. Scientific information</p> <p>L4. Scientific work</p> <p>L5. Medical data</p> <p>L6. Science and preclinical/clinical medicine</p> <p>L7. Medical information on the web</p> <p>L8. Index publications and access to them</p> <p>L9. Ethics in research</p> <p>L10. Basics of statistical conclusion</p> <p>L11. How to select an appropriate statistical test?</p> <p>L12. Presenting the results of scientific work</p>
	Seminars	<p>S1. Types of scientific research, planning</p> <p>S2. Planning scientific research and determining topics by individual groups of students</p> <p>S3. Types of scientific research, measurement</p> <p>S4. Use of bibliographic sources and strategies for their search</p> <p>S5. Scientific article in medicine</p> <p>S6. Data collection and measurement</p> <p>S7. Data types (Analog, Digital)</p> <p>S8. Preparation for data processing</p> <p>S9. Preparation for writing own scientific article (instructions for authors, mentor agreement)</p> <p>S10. Interpreting the research results</p> <p>S11. Scientific article presentation and discussion</p> <p>S12. Writing own scientific article</p> <p>S13. Communication skills in scientific research</p> <p>S14. Preparation of the final draft of students' own scientific work</p>
Practical (Exercises)	<p>P1. Data collection</p> <p>P2. Data collection online</p> <p>P3. Data types (analog, digital), creating the coding plan</p> <p>P4. Data organization and formatting – sorting, formulas, functions, filters</p> <p>P5. Confronting the data – Data entry</p> <p>P6. Confronting the data – Data entry (2)</p> <p>P7. Data validation – analyzing the correctness and validity of the entered data; organizing data</p> <p>P8. Dealing with the data – Data processing</p> <p>P9. Dealing with the data – Data processing (2)</p> <p>P10. Confronting the data – Data presentation</p> <p>P11. Writing the Materials and methods and Results sections of own scientific article</p> <p>P12. Search for the relevant journal articles in accordance with the set problem and strategy</p> <p>P13. Analysis of the structure and content of the selected scientific article</p> <p>P14. Writing the Introduction and Discussion sections of own scientific article</p> <p>P15. Writing References – introduction to reference organizing tools</p> <p>P16. Final writing and submitting the scientific paper for review</p>	
Language	English	
E-learning	Classes are conducted live. If necessary, lectures, seminars and part of the exercises can be combined (live and online) or online via e-learning platforms (Google Meet) - up to max. of 20% of the classes can be held online.	

Teaching methods		Teaching, interactive and active-experiential.									
Types of assessment (indicate - <b>Bold</b> )											
Type of pre-examination obligation						Type of exam					
midterm	seminar paper	essay/report	<b>practical/project task</b>			other	<b>written exam</b>	oral exam	practical		
Allocation of ECTS credits and share in the grade											
Student obligations		Learning outcome code		Hours of workload			Share in ECTS		Share in grade		
Attending classes				100			3.3		10%		
Practical/project task with oral presentation		IU-MFMSE104-5		60			2		40%		
Written exam		IU-MFMSE104-1 IU-MFMSE104-2 IU-MFMSE104-3 IU-MFMSE104-4 IU-MFMSE104-6		50			1.7		50%		
In total				210			7		100%		
Method of calculating the final grade											
The final grade is obtained by adding up the total number of points achieved by regular attendance at classes (20% of the grade), exam results (30% of the grade) and the quality of scientific research (written work and presentation of the work, 50% of the grade). A detailed description is given in the additional information about the subject.											
Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	Croatian	English	other	multilingual	book	article	script	other
Compulsory	Matko Marušić et al.: Principles of research in medicine, 2nd edition, Medicinska naklada, Zagreb 2019.		x		x			x			
Additional	Teaching materials	x			x						x
Additional course information											
Teaching in <b>Scientific Methodology</b> consists of lectures, seminars and exercises, where the focus is on practical exercises and the creation of own research (50% of the lesson) where each student must work in a team (small group) on a unique research problem under the supervision of the head of the exercises and the head of the course. Teaching is organized through six teaching units: 1. Scientific way of thinking 2. Scientific research 3. Scientific information 4. Scientific work 5. Science in preclinical and clinical medicine 6. Students' scientific work.											
<p><b>Student work and activity</b> in class are continuously evaluated during classes, mainly in seminars and exercises that are organized through the active work of students under the supervision of teachers who direct, supervise and help them in the implementation of scientific research, which ends with the submission of a written scientific paper and an oral and poster presentation. Classical delivery of classes (ex-chair) is minimized in this course and is based on the principles of the Bologna process, which is working in small groups with the active involvement of the student who is at the center of the teaching as a dynamic and not a passive participant. Students are also taught the basics of communication skills in science, especially in public speaking and how scientific research is presented.</p> <p>According to the Rulebook on studying at the University of Mostar, the final grade is assigned as follows:  0-54%, insufficient (1);  55-66%, sufficient (2);  67-78%, good (3); 7  9- 90%, very good (4);  91-100%, excellent (5).</p>											
<p><b>The written test</b> consists of 30 written questions of the multiple-choice type with one correct answer. The minimum for passing is 17 points or 55% of correctly solved questions.</p>											
<p><b>The oral presentation</b> includes the presentation of scientific research works according to the principle applicable for presentations at the congresses. Each student group presents their scientific research results with a PowerPoint presentation and answers the questions of fellow students and teachers with a final poster presentation (40% of the final grade).</p>											

**The final grade** is calculated as the total sum of points achieved during active attendance at classes (10% of the final grade), writing of the scientific paper and oral/poster presentation (40% of the final), and the results of the written test (50% of the final grade).



Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	--		
Year of study	1	Semester	I		
Course title	MEDICAL ETHICS	Course code	MFMSE105		
ECTS	2	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		20	0	25	0
Teachers	Prof. Ana Marušić, MD, PhD	4		4	
	Assoc. Prof. Sandra Kostić, PhD	8		7	
	Assist. Prof. Benjamin Benzon, MD, PhD	8		7	
	Marija Franka Žuljević, MD			7	
Course objectives	The aim of this course is to familiarize students with basic principles of ethics, medical ethics and medical deontology, as well as to enable them to identify moral dilemmas in medicine, and provide means of dealing with them. Additionally, students will familiarize themselves with specifics of research and publications ethics, as well as procedures for ethics assessment of research proposals, and understand the development of human and patients' rights movements.				
Course learning outcomes	Learning outcome (LO) Student:		Course learning outcome code	LO code at the study program level	
	Understands the differences between ethics, medical ethics, medical deontology, and law.		IU-MFMSE105-1	IU-MSE12	
	Understands the history of development of physicians' oaths and medical deontology, as well as patient and human rights.		IU-MFMSE105-2	IU-MSE12	
	Acquaint themselves with the important international documents related to human rights and medical ethics: General Declaration of Human rights, European Declaration of Human Rights, Hippocratic oath, The Deceleration of Geneva, The Declaration of Helsinki, Good clinical practice.		IU-MFMSE105-3	IU-MSE12	
	Lists and understands the most common ways of addressing moral dilemmas in medicine.		IU-MFMSE105-4	IU-MSE12	
	Practices obtaining and explaining basic informed consent to a patient.		IU-MFMSE105-5	IU-MSE16 IU-MSE17	
	Understands and debates ethical dilemmas related to: beginning and end of life matters, genetic testing, reproductive medicine, sport and doping, mental illness, vulnerable groups, consent and assent to treatment, medical errors, rights to privacy, research integrity, animal rights, and stem cell research.		IU-MFMSE105-6	IU-MSE12 IU-MSE13	
	Understands the value and importance of research ethics and research integrity and data protection.		IU-MFMSE105-7	IU-MSE7 IU-MSE12	
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.				
Course content	Week / shift	Topic			
	Lecture 1 (2h)	Introduction to ethics and moral development			
	Lecture 2 (2h)	Medical deontology			
	Lecture 3 (2h)	Handling ethical dilemmas			
	Lecture 4 (2h)	Animal rights and laboratory research			
	Seminar 1 (3h)	Patient-doctor relationship			
	Seminar 2 (3h)	Applying basic ethical principles in practice			
	Seminar 3 (3h)	Informed consent			
Seminar 4 (3h)	Issues related to the beginning and end of life				

	Seminar 5 (3h)	Medicine of the future									
	Seminar 6 (3h)	Case studies I									
	Seminar 7 (3h)	Case studies II									
	Seminar 8 (3h)	Reflection and re-evaluation									
	Lecture 5 (2h)	History of human experimentation									
	Lecture 6 (2h)	Patient rights									
	Lecture 7 (2h)	Vulnerable groups									
	Lecture 8 (2h)	Disasters									
	Lecture 9 (2h)	Research and publication ethics									
	Lecture 10 (2h)	Data protection									
	Seminar 9 (2h)	Research integrity I									
	Seminar 9 (2h)	Research integrity II									
	Language	English									
E-learning	None										
Teaching methods	Lectures, moderated group discussions and debates, case analyses and discussions, roleplay.										
<b>Types of assessment (indicate - <b>Bold</b>)</b>											
<b>Type of pre-examination obligation</b>											
midterm	seminar paper	<b>essay/report</b>									
		practical/project task									
		other									
<b>Type of exam</b>											
		<b>written exam</b>									
		oral exam									
		practical									
<b>Allocation of ECTS credits and share in the grade</b>											
Student obligations	Learning outcome code	Hours of workload									
Regular course attendance	IU-MFMSE105-1, 2, 3	45									
Seminar report	IU-MFMSE105-4, 5,	10									
Essay (main exam)	IU-MFMSE105-6,7	5									
In total		60									
		2									
		100%									
<b>Method of calculating the final grade</b>											
Course attendance (25%, passing 14%) + Seminar report (25%, passing 14%) + Essay (50%, passing 28%).											
According to the Study Regulations, the final grade is obtained as follows:											
0 – 54% insufficient (1)											
55 – 66% sufficient (2)											
67 – 78% good (3)											
79 – 90% very good (4)											
91 – 100% excellent (5)											
Literature (indicate)	Title (title, author, year)	Edition	Language				Type of literature				
		own	other	Croatian	English	other	multilingual	book	article	script	other
	Medical Ethics Manual. World Medical Association, 2015.				X			X			
	The Universal Declaration of Human Rights				X						X
	European Convention on Human Rights				X						X
	The Declaration of Helsinki				X						X
Patients' rights in the European Union. Directorate-General for Health and Food Safety (European Commission)				X						X	

	European Code of Conduct for Research Integrity				X						X
Additional	Principles of Biomedical Ethics. Beauchamp and Childress. 7th edition. 2013.				X			X			
	Resolving Ethical Dilemmas: A Guide for Clinicians, Bernard Lo, 2015.				X			X			
Additional course information											
For the seminar "Medicine of the future", students have a task to write a brief report about what they see as the future of medicine, along with an example of the application of a novel technology in medicine.											

Study programme	MEDICAL STUDIES IN ENGLISH						
Cycle	INTEGRATED	Type	UNIVERSITY				
Study track	-	Module	-				
Year of study	1	Semester	I				
Course title	CROATIAN LANGUAGE I	Course code	MFMSE106				
ECTS	1	Status	OBLIGATORY				
Teaching hours		Lectures	Exercises	Seminars	Practice		
		0	0	25	0		
Teachers	dr. sc. Ivona Baković, doc.				25		
Course objectives	<ul style="list-style-type: none"> <li>- to apply grammatical structures in the Croatian language and vocabulary for acquiring language competence at the A1 and A2 levels (according to the <i>Common European Framework of Reference for Languages</i>)</li> <li>- to recognize cultural features of the Croatian speaking area</li> </ul>						
Course learning outcomes	Learning outcome (LO) Student:			Course learning outcome code	LO code at the study program level		
	Applies the basics of phonology, morphology and syntax of the CL related to the content of the course			IU-MFMSE106-1	IU-MSE14 IU-MSE19		
	Demonstrates basic conversational skills			IU-MFMSE106-2	IU-MSE14 IU-MSE19		
	Demonstrates reading and writing of simple texts			IU-MFMSE106-3	IU-MSE14 IU-MSE19		
	Applies topic-related vocabulary			IU-MFMSE106-4	IU-MSE14 IU-MSE19		
	Recognizes cultural features of the Croatian speaking area			IU-MFMSE106-5	IU-MSE14 IU-MSE19		
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.						
Course content	Week / shift		Topic				
	1.		Personal pronouns.				
	2.		The verb <i>biti</i> : affirmative, negative and interrogative.				
	3.		Nouns: grammatical gender.				
	4.		Croatian Alphabet. Capital Letters.				
	5.		Possessive pronouns. Capitalizing the pronoun in formal situations.				
	6.		The verb <i>imati</i> . Numbers.				
	7.		The pronoun <i>kakav</i> . Adjectives.				
	8.		Possessive adjectives.				
	9.		Present tense ( <i>-ati &gt; -am</i> ). Accusative case.				
	10.		Long plural.				
	11.		The target of movement: prepositions <i>u</i> and <i>na</i> + accusative case.				
	12.		The purpose of movement: preposition <i>po</i> + accusative case.				
	13.		Time expressions.				
	14.		Present tense ( <i>-iti &gt; -im, -jeti &gt; -im</i> ).				
15.		Present tense of the verbs <i>jesti</i> and <i>piti</i> .					
Language	English						
E-learning	In accordance with study regulations (up to max 20%).						
Teaching methods	<ul style="list-style-type: none"> <li>- Teaching methods</li> <li>- Interactive methods</li> </ul>						
Types of assessment (indicate - <b>Bold</b> )							
Type of pre-examination obligation					Type of exam		
midterm	seminar paper	essay/report	practical/project task	<b>other</b>	<b>written exam</b>	<b>oral exam</b>	practical
Allocation of ECTS credits and share in the grade							

Student obligations	Learning outcome code	Hours of workload	Share in ECTS	Share in grade
Attending classes and preparing for the exam	-	25	0,8	20 %
Pre-exam/Final exam	IU-MFMSE106-1 IU-MFMSE106-2 IU-MFMSE106-3 IU-MFMSE106-4 IU-MFMSE106-5	5	0,2	80 %
In total		30	1	100%

**Method of calculating the final grade**

Attending classes and preparing for the exam:

- irregular arrivals = 0% of the final grade
- regular arrivals without activities = 11% of the final grade
- activity only at the teacher's instigation = 14% of the final grade
- self-initiated activity = 17% of the final grade
- self-initiated activity with quality discussion = 20% of the final grade

Pre exam or final written/oral exam:

- less than 55% correct answers = 0% of the final grade
- 55% - 66% correct answers = 44% of the final grade
- 67% - 78% correct answers = 56% of the final grade
- 79% - 90% correct answers = 68% of the final grade
- 91% - 100% correct answers = 80% of the final grade

According to the Study Regulations, the final grade is obtained as follows:

- 0 – 54% insufficient (1)
- 55 – 66% sufficient (2)
- 67 – 78% good (3)
- 79 – 90% very good (4)
- 91 – 100% excellent (5)

Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature				
		own	other	croatian	english	other	multilingual	book	article	script	other	
Compulsory	Čilaš Mikulić, M. – Gulešić Machata, M. – Udier, S. L., <i>Razgovarajte s nama!</i> , udžbenik hrvatskoga jezika za razine A1 -A2, Hrvatska sveučilišna naklada, Zagreb, 2021.		x	x					x			
	Čilaš Mikulić, M. – Gulešić Machata, M. – Udier, S. L., <i>Razgovarajte s nama!</i> , vježbenica hrvatskoga jezika za razine A1 -A2, Hrvatska sveučilišna naklada, Zagreb, 2021.		x	x					x			
Additional	Krešić, K. – Budmir, I., <i>Hrvatski za vas</i> , udžbenik hrvatskoga jezika za početnike	x		x					x			

	A1 I A2, PRESSUM, Mostar, 2021.										
Additional course information											
- The student is obliged to regularly attend lectures. - Unexcused absences must be justified with our student doctor and with a request to the course instructor.											

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	II		
Course title	MEDICAL CHEMISTRY AND BIOCHEMISTRY I	Course code	MFMSE201		
ECTS	7.5	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		32	26	22	0
Teachers	Assoc. Prof. Ivana Martinović, PhD	17	0	0	0
	Assoc. Prof. Ilijana Odak, PhD	15	0	7	0
	Gloria Zlatić, s. asst.	0	0	15	0
	Ante Pušić, asst.	0	13	0	0
	Ivona Cvetković, asst.	0	13	0	0
Course objectives	<ul style="list-style-type: none"> <li>- train students to apply basic knowledge about chemical structure and physicochemical processes, which are necessary for understanding biochemical and physiological processes</li> <li>- achieve the student's understanding of the basic principles and mechanisms of reactions of simple and complex organic/biological molecules</li> <li>- train students to apply classical and instrumental methods of chemical analysis</li> <li>- train students to interpret results and experimentally determine chemical changes using theoretical chemical laws</li> </ul>				
Course learning outcomes	Learning outcome (LO) Student:			Course learning outcome code	LO code at the study program level
	Explains the theory of aqueous solutions, electrolytes, non-electrolytes, and physical laws.			IU-MFMSE201-1	IU-MSE1
	Analyzes chemical processes according to the concepts of chemical thermodynamics, kinetics, and equilibrium			IU-MFMSE201-2	IU-MSE1
	Solves calculation problems in chemistry and interprets results using theoretical chemical laws			IU-MFMSE201-3	IU-MSE1
	Classifies organic molecules important for the construction of biological macromolecules, and correlates the properties of molecules (based on chemical structure) and the mechanisms of chemical changes.			IU-MFMSE201-4	IU-MSE1
	Applies physicochemical quantities and methods used in biomedical sciences.			IU-MFMSE201-5	IU-MSE1
	Independently calculates and explains the results of chemical analysis.			IU-MFMSE201-6	IU-MSE1
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar				
Course content	Week / shift	Topic			
	L2	Molecular structure and chemical bond, bioelements, chemical bonds between biomolecules, basic elements of living matter			
	L4	Water as the solvent. The distribution of the substance in solution. Electrolytes. The acids and base. Buffers.			
	L6	Colligative properties. The osmotically active particles. Colloid-dispersed systems. Precipitation reactions. Colloids and macromolecules.			
	L8	Thermodynamics and thermochemistry. Thermodynamic Laws. Internal energy. Enthalpy. Entropy. Gibbs's energy.			
L10	Energy of biological systems. Energy balance of biochemical systems.				

	L12	Chemical equilibrium. The influence of concentration, temperature and pressure on the chemical balance. The equilibrium constant and Gibbs energy.
	L14	Chemical kinetics. The speed of reaction. Order and molecularity reaction. Factors affecting the rate of reaction. Enzymes. Complex reactions.
	L16	Electrochemistry. Electrode potential and electrochemical cells.
	L17	Gibbs energy of redox reactions. The biological redox systems.
	L18	Introduction to Organic Chemistry. Classification of organic compounds. The functional groups.
	L19	Alkanes and cycloalkanes. Stereochemistry.
	L20	Alkenes and alkynes.
	L21	Aromatic compounds.
	L22	The alkyl halides. Nucleophilic substitution at saturated carbon. Elimination reactions.
	L23	Alcohols, ethers, thiols, sulfides. Classification and physical properties of alcohol. Biologically important alcohols and phenols.
	L24	Oxidation and reduction of carbonyl compounds.
	L25	Aldehydes and ketones. Nucleophilic addition reaction.
	L26	Carboxylic acid and derivatives. Physical Properties. The acidity of the carboxylic acid. The carboxylic acid derivatives. Nucleophilic acyl substitution.
	L28	Carbohydrates. Nucleosides, nucleotides and nucleic acids. Classification. Fisher's formula. Epimers. Redox reactions of monosaccharides. Straight-chain and cyclic forms. Anomeric carbon atom. Mutarotation. Haworth formula. Glycosides. Reducing and non-reducing sugars. Disaccharides. Polysaccharides. Nucleosides, nucleotides and nucleic acids.
	L30	Amino acids and proteins. Relative configuration. Zwitterion. Peptide bond. Primary, secondary and tertiary protein structure. Enzymes. Lipids. Physico-chemical properties of lipids.
	S3	Calculation problems in chemistry -solutions.
	S6	a pH of acids, bases and salts
	S9	pH of buffers
	S11	Colligative properties
	S14	Thermodynamics and thermochemistry
	S15	Electrochemistry.
	S17	Nomenclature. Isomerism.
	S18	Stereochemistry. Chirality. Stereoisomers: enantiomers and diastereomers. Fisher projection formula. CIP system nomenclature.
	S19	Substitution, elimination, oxidation, reduction.
	S20	Addition at carbonyl carbon.
	S21	Acyl substitution.
	S22	Bioorganic compounds.
	V1	Laboratory equipment and basic laboratory techniques.
	V2	Preparation of the solutions.
	V3	Optical methods
	V4	Colloids
	V5	Osmotic resistance of erythrocytes
	V6	Buffers; The buffer capacity; The influence of the addition of a strong acid / base to buffer pH value
	V7	Volumetry: Acid-base titration
	V8	Classification tests of functional groups
	V9	Synthesis of aspirin
Language	English	
E-learning	Classes are conducted in person (live). If necessary, lectures, seminars and part of the exercises can be combined (live and online) or completely online via e-learning platforms (Google Meet) up to a maximum 20%.	



Teaching methods		- lecture, presentation - free and guided conversation, dialogue, discussion - work in the laboratory									
Types of assessment (indicate - <b>Bold</b> )											
Type of pre-examination obligation						Type of exam					
<b>midterm</b>	seminar paper	essay/report	practical/project task		Other	<b>written exam</b>	oral exam	practical			
Allocation of ECTS credits and share in the grade											
Student obligations		Learning outcome code		Hours of workload		Share in ECTS		Share in grade			
Attending classes		-		80		2.7		0%			
Midterm (exercises)		IU-MFMSE201-5 IU-MFMSE201-6		20		0.8		10%			
Pre exam/written exam		IU-MFMSE201-1		25		0.8		90%			
		IU-MFMSE201-2		20		0.7					
		IU-MFMSE201-3		30		1.0					
		IU-MFMSE201-4		45		1.5					
In total				220		7.5		100%			
Method of calculating the final grade											
<p>Midterm          Max. points:10          1-4 - insufficient (1)          5-6– sufficient (2)          6-7 – good (3)          8-9 – very good (4)          10 – excellent (5)</p> <p>Written exam:          Max. points:100          &lt; 55 insufficient (1)          55 - 66 - sufficient (2)          67-78 – good (3)          79-90 – very good (4)          91-100 – excellent (5)</p> <p>Example of final grade calculation:          Student gets:          -4 from the written exam, <b>(4x0.9)</b>          -3 from Midterm , <b>(3x0.1)</b></p> <p>Final grade = (4x0.9)+ (3x0.1) = 3.6 + 0.3 = 3.9 (very good)</p>											
Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	K. J. Denniston, J. J. Topping, R. L. Caret, General, Organic, and Biochemistry, 4th Edition, McGraw Hill, New York, 2004.		x		x			x			
	Calculation problems in chemistry, G. Zlatić, I. Martinović, 2019.	x			x					x	
	Laboratory Manual for Medical Chemistry (I. Mikulić and co.), 2019	x			x					x	
Additional	P. W. Atkins and J. de Paula, Physical		x		x			x			

	Chemistry For The Life Sciences, 2nd edition, Oxford University Press, 2011.										
	D. J. Hart, C. M. Hadad, L. E. Craine, H. Hart, Organic Chemistry – A Short Course, 13th Ed, Brooks/Cole, Cengage Learning, Belmont, 2012.		x		x			x			
Additional course information											

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	II		
Course title	PHYSICAL EDUCATION I	Course code	MFMSE202		
ECTS	0.5	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		0	25	0	0
Teachers	dr. sc. Ivan Kvesić, izv. prof.	0	25	0	0
Course objectives	<ul style="list-style-type: none"> <li>- To expand students' knowledge about the impact of kinesiology activities on the level of health.</li> <li>- To expand students' knowledge about the general process of exercise as well as the consequences of the effects of these processes on the human body with special reference to the preservation of health achieved through kinesiology processes.</li> <li>- To expand students' knowledge about ways to solve problems related to exercise processes.</li> <li>- to train students for independent work and expand students' knowledge about the importance of exercise in everyday life.</li> </ul>				
Course learning outcomes	Learning outcome (LO) Student:			Course learning outcome code	LO code at the study program level
	Applies warm-up exercises for a particular kinesiological activity.			IU-MFMSE202-1	IU-MSE21
	Independently analyzes and becomes aware of the importance of exercise in everyday life.			IU-MFMSE202-2	IU-MSE21 IU-MSE13
	It assesses the need and importance of daily exercise in order to preserve health and improve the quality of life.			IU-MFMSE202-3	IU-MSE13
	It creates an active break (an active break between studying and during free time).			IU-MFMSE202-4	IU-MSE13
It presents tolerance, work habits and self-discipline.			IU-MFMSE202-5	IU-MSE13	
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar				
Course content	Week / shift	Topic			
	1.	Introductory meeting and familiarization of students with obligations			
	2.	Structure of the Physical Education class			
	3.	General preparatory exercises and their application			
	4.	Football - structure of football training (content and organization)			
	5.	Football – a modified form of indoor and outdoor football			
	6.	Handball - basics of handball game and improvement of new elements			
	7.	Volleyball - the basics of the volleyball game and improvement of volleyball training structures			
	8.	Volleyball - service, service reception, lifting, throwing, block and defense in the field			
	9.	Basketball - structure of basketball training (content and organization)			
	10.	Basketball – a modified mode of basketball			
	11.	Tennis – forehand shot under the hand, forehand shot above the head			
	12.	Tennis - high serve and short serve and movements on the court in the direction back and forth			
	13.	Walking tour - organization of excursions in nature			
	14.	Repetition and improvement of general preparatory exercises			
15.	Repetition of the learned content as chosen by the student				
Language	English				
E-learning	Sumarum, possibility of establishing online classes via the platform: Google meet or Zoom up to a maximum 20 %.				

Teaching methods	<ul style="list-style-type: none"> <li>- teaching methods - presentation</li> <li>- practical methods (exercises in the hall, exercises in nature or outdoors, exercises in the pool)</li> <li>- interactive methods (conversation and agreement about the class and exercises, dialogue, communication about the course and mutual, creative ideas about the contents of the exercises)</li> </ul>
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**Types of assessment (indicate - **Bold**)**

Type of pre-examination obligation					Type of exam		
midterm	<b>seminar paper</b>	essay/report	practical/project task	other	written exam	oral exam	<b>practical</b>

**Allocation of ECTS credits and share in the grade**

Student obligations	Learning outcome code	Hours of workload	Share in ECTS	Share in grade
Attending classes preparing for the practical	IU-MFMSE202-1 IU-MFMSE202-2 IU-MFMSE202-3 IU-MFMSE202-4 IU-MFMSE202-5	25	0.5	100 %
In total		25	0.5	100 %

**Method of calculating the final grade**

**Attending classes and preparing for the practical assignment/exam:**

Class attendance and class activities:

- irregular arrivals = 0% grade
- more than 80% attendance at exercises = 100% descriptive grade

Exceptionally for students who are exempted from exercises due to health or sports (top athletes) exemptions, students are required to write a seminar paper.

**Writing a seminar paper:**

- the paper is not written = 0% grade.
- The work fully meets the formal and content criteria and is grammatically and spelling correct = 100% grade

According to the Study Regulations, the final grade is obtained as follows:

- 0 – 54% insufficient (1)
- 55 – 66% sufficient (2)
- 67 – 78% good (3)
- 79 – 90% very good (4)
- 91 – 100% excellent (5)

An exception is the subject of Physical Education, where a descriptive grade of "passed" is included in accordance with regular attendance at exercises.

Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature				
		own	other	croatian	english	other	multilingual	book	article	script	other	
Compulsory	Educating the Student Body: Taking Physical Activity and Physical Education to School, Harold W. Kohl III and Heather D. Cook, 2013.		X		X				X			
Additional												

**Additional course information**

- The student is obliged to regularly attend exercises from the course.
- The condition for entering the final descriptive grade is met with the attendance of at least 80% of the classes held.
- Exceptional efforts at exercises will be rewarded with additional (accumulation) pluses. The maximum number of accumulation points is 2 plus in the record.
- Unexcused absences must be justified with our student doctor and with a request to the course instructor.
- Exempted students are required to write a seminar paper

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	II		
Course title	ANATOMY	Course code	MFMSE203		
ECTS	21	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		60	90	65	0
Teachers	dr.sc. Katarina Vukojević, prof.	8	2	8	0
	dr. sc. Dragica Bobinac, prof	6	0	8	0
	dr. sc. Ana Marušić, prof	0	0	5	0
	dr. sc. Ivica Grković, prof	6	0	5	0
	dr. sc. Josip Mišković, izv. prof.	8	8	8	0
	dr. sc. Marko Ostojić, izv. prof	4	2	4	0
	dr. sc. Natalija Filipović, izv. prof.	2	2	3	0
	dr. sc. Pejana Rastović, doc.	6	5	8	0
	dr. sc. Josip Lesko, doc.	6	5	8	0
	dr. sc. Josip Novaković, doc.	8	6	6	0
	dr. sc. Ana Čarić, doc	2	0	2	0
	dr. sc. Benjamin Benzon	4	0	4	0
	dr. sc. Azer Rizikaló, viši ass.	0	20	0	0
	Mirko Maglica, ass.	0	20	0	0
Ilija Perutina, ass.	0	20	0	0	
Course objectives	<p>Course objectives are:</p> <p>To enable students to understand the structure of the human body.</p> <p>To enable students to acquire knowledge about the structure of the human body through systematic and topographic anatomy and thus enable them to understand the normal and pathological morphology of man, the relationship between surface forms and deeper structures and the relationship of these structures as a framework for life processes.</p> <p>Clinical importance of individual regions and coping in spatial orientation within the human body.</p> <p>Master in detail the systematic, functional and topographic anatomy of all regions, as well as the functional anatomy of the locomotor system, cardiovascular, respiratory, digestive, urinary and sexual systems and peripheral nervous system, including the basics of organization of major motor and sensory systems.</p> <p>Systemic anatomy: features of organs, their blood supply and innervation. According to this approach, organs are grouped according to a common function. The emphasis is on general anatomical principles important for understanding the structure and function of the human body.</p> <p>Topographic anatomy: characteristics of organs with regard to their location and interrelationship with surrounding structures (position in the body). All organs belong to a body system and a specific anatomical region.</p>				
Course learning outcomes	Learning outcome (LO) Student:		Course learning outcome code	LO code at the study program level	
	Explains the concepts of anatomical terminology		IU-MFMSE203-1	IU-MSE2 IU-MSE21	
	Describes the similarities and distinguishes the peculiarities of the individual organs structures of each of the basic structural groups: a) somatic structures (skin, fascia, bones, joints, muscles...), b) visceral structures (solid and hollow organs), c) supply and control structures (vascular and nervous systems)		IU-MFMSE203-2	IU-MSE2	
	Describes the human body division into regions (separated by "anatomic borders"), describes the content of regions and assembles anatomical structures (tissues and organs), with regard to common functional features, in (organic) systems		IU-MFMSE203-3	IU-MSE2	

	Applies basic knowledge of anatomy to concrete clinical situations	IU-MFMSE203-4	IU-MSE1 IU-MSE8
	Shows projections of clinically relevant anatomical structures on normal, living body and connects the peculiarities of structure with function of individual anatomical structures (for important movements, activities, reflexes...)	IU-MFMSE203-5	IU-MSE1
	Compares anatomical sections of anatomical structures with different radiological methods	IU-MFMSE203-6	IU-MSE2 IU-MSE8
	Describes anatomical structures on body sections in various body heights and directions	IU-MFMSE203-7	IU-MSE1
	Explains and names parts of isolated and/or dissected organs of the body.	IU-MFMSE203-8	IU-MSE1
<b>Prerequisites for the course enrolment</b>	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.		
<b>Course content</b>	<b>Week / shift</b>	<b>Topic</b>	
	I.	<b>UNIT 1: BONES AND JOINTS OF THE TRUNK</b> Lecture 1: Introduction to anatomy, principles of osteology and syndesmology Seminar 1: Vertebral column, ribs and sternum Exercise 1: Bones and joints of the trunk	
	II.	<b>UNIT 2: BONES AND JOINTS OF THE UPPER LIMB – PECTORAL REGION AND SHOULDER GIRDLE</b> Seminar 2: Bones of shoulder girdle and shoulder joints Exercise 2: Bones of shoulder girdle and shoulder joints and arm	
	III.	<b>UNIT 3: RADIOLOGICAL ANATOMY</b> Lecture 2: Principles of radiological anatomy Exercise 3: Orientation points on the body. Radiological anatomy of axial skeleton and shoulder regions	
	IV.	<b>UNIT 4: BONES AND JOINTS OF THE UPPER LIMB – FOREARM AND HAND</b> Seminar 3: Bones and joints of the forearm and hand Exercise 4: Bones and joints of the forearm and hand	
	V.	<b>UNIT 5: BONES AND JOINTS OF THE LOWER LIMB – PELVIC GIRDLE, HIP &amp; THIGH</b> Seminar 4: Bones and joints of the hip and thigh	
	VI.	Exercise 5: Bones and joints of the hip and thigh <b>UNIT 6: BONES AND JOINTS OF THE LOWER LIMB – LEG AND FOOT</b> Seminar 5: Bones and joints of the leg and foot Exercise 6: Bones and joints of the leg and foot	
	VII.	<b>UNIT 7: NEUROCRANIUM</b> Lecture 3: Cranial bones and aspects of cranium Seminar 6: Orientation points on the cranium. Neurocranial bones and aspects of neurocranium Exercise 7: Neurocranial bones	
	VIII.	<b>UNIT 8: VISCEROCRANIUM</b> Seminar 7: Viscerocranium Exercise 8: Viscerocranial bones and aspects of viscerocranium	
	IX.	<b>UNIT 9: PRINCIPLES OF ORGANIZATION OF THE CENTRAL NERVOUS SYSTEM</b> Lecture 4: Organization of the central nervous system Seminar 8: Cerebrum and cerebellum Exercise 9: Sectional anatomy of the central nervous system	
	X.	<b>UNIT 10: SPINAL CORD AND SPINAL NERVES</b> Lecture 5: Spinal cord and spinal nerves Seminar 9: Somatic and autonomic nervous systems Exercise 10: Spinal nerves and somatic plexuses, structure and organisation	
XI.	<b>UNIT 11: BASIS OF THE BRAIN AND CRANIAL NERVES</b> Lecture 6: Brainstem and cranial nerves Seminar 10: Organisation of cranial nerves		

	Exercise 11: Cranial nerve exits at brain basis and cranium, cranial nerve nucleus structure. Organisation of brain stem nuclei
XII.	<b>UNIT 12: VENTRICULAR SYSTEM AND BLOOD VESSELS OF THE BRAIN</b> Lecture 7: Blood vessels of the brain, spinal cord and CSF Seminar 11: Blood brain circulation in the central nervous system Exercise 12: Venous sinuses, blood vessels of the brain, spinal cord and meninges, ventricular system of CNS
XIII.	<b>UNIT 13: PRINCIPLES OF CARDIO-VASCULAR SYSTEM AND HEART</b> Lecture 8: Principles of cardiovascular system and heart, circulation Seminar 12: Heart Exercise 13: Heart and blood vessels and circulation
XIV.	<b>UNIT 14: PRINCIPLES OF VISCERAL SYSTEMS</b> Lecture 9: Principles of the organization of visceral organs Exercise 14: Position and structure of visceral organs
XV.	<b>UNIT 15: REGIO PAROTIDEOMASSETERICA ET REGIO BUCCALIS</b> Lecture 10: Regio parotideomasseterica et buccalis Seminar 13: Regio parotideomasseterica et buccalis Exercise 15: Regio parotideomasseterica et regio buccalis – section
XVI.	<b>UNIT 16: EPICRANIUM ET REGIO TEMPORALIS</b> Lecture 11: Epicranium et regio temporalis Seminar 14: Auris Exercise 16: Regio temporalis et auricularis – section
XVII.	<b>UNIT 17: REGIO ORBITALIS</b> Lecture 12: Regio orbitalis Seminar 15: Orbita et oculus Exercise 17: Regio orbitalis – section
XVIII.	<b>UNIT 18: REGIO NASALIS, FOSSA INFRATEMPORALIS ET PTERYGOPALATINA</b> Lecture 13: Regio nasalis Seminar 16: Nose and paranasal sinuses. Fossa infratemporalis et pterygopalatina Exercise 18: Facies, fossa pterygopalatina et fossa infratemporalis- section
XIX.	<b>UNIT 19: REGIO ORALIS ET MENTALIS. TRIGONUM SUBMANDIBULARE</b> Lecture 14: Cavum oris et trigonum submandibulare Seminar 17: Oral cavity Exercise 19: Trigonum submandibulare – section
XX.	<b>UNIT 20: TRIGONUM CAROTICUM</b> Lecture 15: Trigonum caroticum Seminar 18: Pharynx Exercise 20: Trigonum caroticum et pharynx – section
XXI.	<b>Lecture 16: Trigonum musculare</b> Seminar 19: Larynx Exercise 21: Trigonum musculare et fossa jugularis – section
XXII.	<b>UNIT 22: REGIO CERVICALIS LATERALIS</b> Lecture 17: Regio cervicalis lateralis Seminar 20: Regio cervicalis lateralis Exercise 22: Regio cervicalis lateralis – section
XXIII.	<b>UNIT 23: REGIO PECTORALIS ET FOSSA AXILLARIS</b> Lecture 18: Regio pectoralis et fossa axillaris Seminar 21: Muscles of shoulder girdl and axilla Exercise 23: section of axilla
XXIV.	<b>UNIT 24: TOPOGRAPHIC ANATOMY OF ARM</b> Lecture 19: Topographic anatomy of arm Seminar 22: Muscles of arm and elbow region Exercise 24: Section of arm and elbow region
XXV.	<b>UNIT 25: TOPOGRAPHIC ANATOMY OF FOREARM AND HAND</b> Lecture 20: Topographic anatomy of forearm and hand Seminar 23: Muscles of forearm and hand and carpal tunnel Exercise 25: Section of forearm and hand

	XXVI.	<b>UNIT 26: TOPOGRAPHIC ANATOMY OF THORACIC CAVITY</b> Lecture 21: Mediastinum Seminar 24: Lungs and bronchi Exercise 26: Section of thoracic region					
	XXVII.	<b>UNIT 27: ABDOMINAL WALL AND INGUINAL CANAL</b> Lecture 22: Abdominal wall and inguinal channel Seminar 25: Projections of abdominal organs on the abdominal wall Exercise 27: Anatomical section and demonstration					
	XXVIII.	<b>UNIT 28: PERITONEUM AND MESENTERY</b> Lecture 23: Peritoneum and mesentery Seminar 26: Spaces in the abdominal cavity Exercise 28: Anatomical section and demonstration					
	XXIX.	<b>UNIT 29: TOPOGRAPHIC ANATOMY OF ABDOMINAL CAVITY</b> Lecture 24: Topographic anatomy of the stomach, duodenum, small and large intestine Seminar 27: Abdominal organs Exercise 29: Section of stomach, duodenum, small and large intestine					
	XXX.	<b>UNIT 30: TOPOGRAPHIC ANATOMY OF BACK</b> Lecture 25: Topographic anatomy of back Seminar 28: Back muscles Exercise 30: Section of back muscles					
	XXXI.	<b>UNIT 31: TOPOGRAPHIC ANATOMY OF RETROPERITONAL ORGANS</b> Lecture 26: Topographic anatomy of retroperitoneum Seminar 29: Kidneys and ureters Exercise 31: Section of retroperitoneum					
	XXXII.	<b>UNIT 32: TOPOGRAPHIC ANATOMY OF FEMALE PELVIS</b> Lecture 27: Topographic anatomy of female pelvis Seminar 30: Female reproductive organs Exercise 32: Anatomical section and demonstration					
	XXXIII.	<b>UNIT 33: TOPOGRAPHIC ANATOMY OF MALE PELVIS</b> Lecture 28: Topographic anatomy of male pelvis Seminar 31: Male reproductive organs Exercise 33: Anatomical section and demonstration					
	XXXIV.	<b>UNIT 34: TOPOGRAPHIC ANATOMY OF PELVIC GIRDLE AND THIGH</b> Lecture 29: Topographic anatomy of pelvic girdle and thigh Seminar 32: Muscles of pelvic girdle and thigh Exercise 34: Anatomical section and demonstration					
	XXXV.	<b>UNIT 35: TOPOGRAPHIC ANATOMY OF LEG AND FOOT</b> Lecture 30: Topographic anatomy of leg and foot Seminar 33: Muscles of leg and foot Exercise 35: Anatomical section and demonstration					
	XXXVI.	<b>Exercise 36:</b> Anatomical section and demonstration: head and neck					
	XXXVII.	<b>Exercise 37:</b> Anatomical section and demonstration: upper and lower limbs					
	XXXVIII.	<b>Exercise 38:</b> Anatomical section and demonstration: trunk					
Language	English						
E-learning	Classes are taken in person. If necessary, teaching can take place online via e-learning platforms (Google Meet) in accordance with the Rulebook, up to a maximum 20%.						
Teaching methods	Lectures, interactive and active-experiential.						
<b>Types of assessment (indicate - Bold)</b>							
Type of pre-examination obligation					Type of exam		
midterm	seminar paper	essay/report	practical/project task	<b>other</b>	<b>written exam</b>	<b>oral exam</b>	<b>practical</b>
<b>Allocation of ECTS credits and share in the grade</b>							
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade		
Class attendance			215	7.2			



Pre-exam/partial written exams (A1 + A2)	IU- MFMSE203-1 IU- MFMSE203-2 IU- MFMSE203-3 IU- MFMSE203-4	205	6.8	50%
Practical exam	IU- MFMSE203-5 IU- MFMSE203-7 IU- MFMSE203-8	60	2	20%
Final oral exam	IU- MFMSE203-2 IU- MFMSE203-3 IU- MFMSE203-4 IU- MFMSE203-5 IU- MFMSE203-6 IU- MFMSE203-7 IU- MFMSE203-8	150	5	30%
In total		630	21	100%

**Method of calculating the final grade**

The final grade is calculated based on the weight. The written exam carries 50% of the grade, the practical exam carries 20% of the grade, and the oral exam carries 30% of the grade. A detailed description is given in the additional course information.

Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	Gray's Anatomy for Students, 4th Edition. Authors: Richard Drake & A. Wayne Vogl & Adam W. M. Mitchell		x		x			x			
	Sobotta Atlas of Anatomy, 16th ed., English/Latin, 16th Edition. Authors: Friedrich Paulsen & Jens Waschke		x		x						atlas
Additional	Netter, F.H. Atlas of human anatomy, ICON Learning Systems. 3rd Bk&Cdr edition. Teterboro, NJ; 2003 and updated versions		x		x						atlas

**Additional course information**

**The anatomy course** contains 215 hours and is taken over 12 weeks. This includes the time for preparing partial exams, and the first exam term.

The anatomy exam consists of three parts: written, practical and oral.

**Two partial written exams** will be held during classes.

**The first partial exam** consists of 50 test-questions and the **second partial exam** consists of 100 multiple-choice test-questions. Each correct question brings one point.

Also, during the class, there will be a **continuous knowledge check**, students will take quizzes every day. Quizzes are not graded (only pass / fail is recorded), and depending on the success, the student can get up to three additional points on each partial exam, which are added together with the correct answers.

Based on the total number of points (correct answers from the partial exam + additional points), partial exams are graded as follows:

The written exam is graded as follows:

less than 60% correct answers = insufficient (1)

from 60% to 70% = sufficient (2)

from 71% to 80% = good (3)

from 81% to 90% = very good (4)

from 91% to 100% = excellent (5)

Once passed, the partial exam is valid for the entire academic year and that part of the material will not have to be taken again in writing.

After passing the written part, a practical exam follows.

**At the practical exam**, 25 anatomical structures on the preparations will be marked. All types of preparations can be considered - human plasticized, plastic models as well as donor bodies. To pass the practical part, the student must correctly name and write at least 18 marked structures.

Less than 18 points = insufficient 1

18-19 points = sufficient 2

20-21 points = good 3

22-23 points = very good 4

24-25 points = excellent 5

Once passed, the practical exam is valid for the entire academic year.

After passing the practical exam, the oral part follows.

**At the oral exam**, the student draws 7 cards with questions that are divided into the same number of categories. The student should orally demonstrate basic knowledge from all parts of the material he has extracted in order for his answer to be considered satisfactory.

The final grade is calculated based on the weight. The written exam carries 50% of the grade, the practical exam carries 20% of the grade, and the oral exam carries 30% of the grade.

During the exam deadlines, students who have not passed some of the partial exams must first pass the written part of the exam that did not pass on the partial exams. After passing the complete written exam, the student takes the practical exam, and after passing the practical exam, he takes the oral part of the exam.

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	1	Semester	I		
Course title	Pain and genes – custom made pain treatment	Course code	MFMSEI01		
ECTS	1	Status	ELECTIVE		
Teaching hours		Lectures	Exercises	Seminars	Practice
		8	10	7	-
Teachers	Sandra Kostić, PhD, associate professor	8	10	7	
Course objectives	The objective of the course is to enable students to understand and adopt the basic concepts related to pain and personalized pain treatment based on the knowledge from areas of pharmacogenomics.				
Course learning outcomes	Learning outcome (LO) Student:			Course learning outcome code	LO code at the study program level
	- describes and explains the basic pain terminology and definitions (e.g. nociception, nociceptors, central and peripheral sensitization, allodynia, hyperalgesia...)			IU-MFMSEI-1	IU-MSE1
	- describes and explains the main difference between acute and chronic pain			IU-MFMSEI-2	IU-MSE2
	- describes and analyses methods, drugs and different approaches for the pain treatment available to patients today in specific clinical situations, (and describes the most relevant achievements in the field of pharmacogenomics and their therapeutic potential			IU-MFMSEI-3	IU-MSE6
	- describes and explains the examples from the scientific literature which point to the link between the gene-environment interaction and our pain tolerance			IU-MFMSEI-4	IU-MSE3
- describes the specific pain disorders which result from gene mutations, including congenital insensitivity to pain.			IU-MFMSEI-5	IU-MSE12	
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar				
Course content	Week / shift	Topic			
	Lectures	(L1) The basic pain terminology (e.g. nociception, nociceptors, central and peripheral sensitization, allodynia, hyperalgesia...), the main difference between acute and chronic pain (L2) Neurobiology and genetics of pain (L3) Pain genetics – from preclinical trials to clinic: Methods, drugs and different approaches for the pain treatment available to patients today (L4) Epigenetics – gene and environment interaction			
	Seminars	(S1) The most relevant achievements in the field of pharmacogenomics and their therapeutic potential – from preclinical trials to clinics (S2) Pharmacogenomics – the future of custom made pain treatment (S3) Congenital insensitivity to pain			
	Exercises	(E1) Specific pain disorders which result from gene mutations, including congenital insensitivity to pain, (E2) Pain research			
Language	English				
E-learning	Classes are conducted in person. If necessary, lectures, seminars and exercises can be combined (in person and online) or completely online via e-learning platforms (Google-Meet).				
Teaching methods	Teaching, interactive				
Types of assessment (indicate - <b>Bold</b> )					

Type of pre-examination obligation					Type of exam						
midterm	seminar paper	essay/report	practical/project task	other	written exam	oral exam	practical				
Allocation of ECTS credits and share in the grade											
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade						
Class attendance			25	0.8							
Seminar paper		IU-MFMSEI-3 IU-MFMSEI-4 IU-MFMSEI-5	2	0.1							
Written exam		IU-MFMSEI-1 IU-MFMSEI-2 IU-MFMSEI-3 IU-MFMSEI-4 IU-MFMSEI-5	3	0.1							
In total			30	1	100 %						
Method of calculating the final grade											
The final grade is descriptive, pass/fail. After completing the seminar work and the written exam, student will pass the course.											
Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	- Webster LR, Belfer I. Pharmacogenetics and Personalized Medicine in Pain Management. Clin Lab Med. 2016 Sep;36(3):493-506. doi: 10.1016/j.cl.2016.05.007. Epub 2016 Jun 22.		x		x				x		
	- Ko TM, Wong CS, Wu JY, Chen YT. Pharmacogenomics for personalized pain medicine. Acta Anaesthesiol Taiwan. Mar;54(1):24-30, 2016.		x		x				x		
	- Devor M: How Do Pain Genes Affect Pain Experience? In: Pain Genetics: Basic to Translational Science, First Edition. Editors: Belfer I and Diatchenko L. John Wiley & Sons, Inc., 1-14, 2014.		x			x				x	
Additional	- Mogil JS. Pain genetics: past, present and future. Trends Genet. 2012 Jun;28(6):258-66.		x		x				x		
Additional course information											

Study programme	MEDICAL STUDIES IN ENGLISH						
Cycle	INTEGRATED	Type	UNIVERSITY				
Study track	-	Module	-				
Year of study	1	Semester	II				
Course title	How to construct your own organ	Course code	MFMSEI02				
ECTS	1	Status	ELECTIVE				
Teaching hours		Lectures	Exercises	Seminars	Practice		
		8	10	7	-		
Teachers	Sandra Kostić, PhD, associate professor	8	10	7	-		
Course objectives	The objective of this course is to provide the student with knowledge about the procedures of tissue engineering and the production of regenerative biological materials.						
Course learning outcomes	Learning outcome (LO) Student:			Course learning outcome code	LO code at the study program level		
	- Describes and analyses the main areas in biotechnology			IU-MFMSEI-1	IU-MSE7		
	- Describes and explains the basic characteristics of medical biotechnology using examples within this field			IU-MFMSEI-2	IU-MSE1		
	- Describes and analyses the process of tissue engineering: selection of cells, bioreactors and scaffolds necessary for bioengineering of tissues and organs			IU-MFMSEI-3	IU-MSE2		
	- Explains the positive and negative sides of using stem cells in tissue engineering			IU-MFMSEI-4	IU-MSE2		
	- Explains the ethical problems related to bioengineering of tissues and organs			IU-MFMSEI-5	IU-MSE12		
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar						
Course content	Week / shift		Topic				
	Lectures		(L1) Introduction to biotechnology (L2) Introduction to tissue engineering (L3) Stem cells in tissue engineering (L4) 3D printers in biotechnology				
	Seminars		(S1) Main principle of tissue engineering: selection of cells, carriers, bioreactor (S2) Tissue engineering of specific organs (S3) The most important achievements in the field of artificial bioengineering organs and their therapeutic potential				
	Exercises		(E1) Tissue engineering of specific organs				
Language	English						
E-learning	Classes are conducted in person. If necessary, lectures, seminars and exercises can be combined (in person and online) or completely online via e-learning platforms (Google-Meet).						
Teaching methods	Teaching, interactive						
<b>Types of assessment (indicate - Bold)</b>							
Type of pre-examination obligation				Type of exam			
midterm	<b>seminar paper</b>	essay/report	practical/project task	other	<b>written exam</b>	oral exam	practical
<b>Allocation of ECTS credits and share in the grade</b>							
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade		

Class attendance		25	0.8	
Seminar paper	IU-MFMSEI-3 IU-MFMSEI-4 IU-MFMSEI-5	2	0.1	
Written exam	IU-MFMSEI-1 IU-MFMSEI-2 IU-MFMSEI-3 IU-MFMSEI-4 IU-MFMSEI-5	3	0.1	
In total		30	1	100 %

**Method of calculating the final grade**

The final grade is descriptive, pass/fail. After completing the seminar work and the written exam, student will pass the course.

Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	Tissue Engineering: Toward a New Era of Medicine. Shafiee A, Atala A. Annu Rev Med. 2017.		x		x				x		
	Tissue engineering: from the bedside to the bench and back to the bedside. Sahakyants T, Vacanti JP. Pediatr Surg Int. 2020.		x		x				x		
	Materials (presentations)	x		x	x						
Additional	Meyer U, Meyer TH, Handschel J, Wiesmann HP (2009) Fundamentals of Tissue Engineering and Regenerative Medicine, Springer, New York.		x		x			x			

Additional course information