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| Study programme              | MEDICAL STUDIES IN ENGLISH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                              |                                    |          |
| Cycle                        | INTEGRATED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Type        | UNIVERSITY                   |                                    |          |
| Study track                  | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Module      | -                            |                                    |          |
| Year of study                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Semester    | V                            |                                    |          |
| Course title                 | PATHOLOGY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course code | MFMSE501                     |                                    |          |
| ECTS                         | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Status      | OBLIGATORY                   |                                    |          |
| Teaching hours               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Lectures    | Exercises                    | Seminars                           | Practice |
|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 70          | 70                           | 70                                 | 0        |
| Teachers                     | Prof. Joško Petričević, MD, PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 42          |                              | 42                                 |          |
|                              | Prof. Valdi Pešutić-Pisac, MD, PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 18          | 20                           | 18                                 |          |
|                              | Asst. Prof. Dragana Karan-Križanac, MD, PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10          |                              | 10                                 |          |
|                              | Asst. Sara Marić, MD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |                              |                                    |          |
|                              | Asst. Marija Čolak, MD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             | 26                           |                                    |          |
|                              | Asst. Petra Tomić, MD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                              |                                    |          |
|                              | Asst. Ivica Raguž, MD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             | 24                           |                                    |          |
| Course objectives            | The aim of the Pathology course is to:<br>- provide the students with knowledge about the mechanisms of cells, tissues and organs injury and familiarize them with the morphological changes that underlie diseases;<br>- train students to recognize morphological changes in cells, tissues and organs by acquiring theoretical knowledge in lectures and seminars;<br>- gain knowledge about the origin and outcome of the disease, based on own experiences at clinical autopsies, analysis of microscopic images and analysis of macroscopic preparations |             |                              |                                    |          |
| Course learning outcomes     | Learning outcome (LO)<br>Student:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             | Course learning outcome code | LO code at the study program level |          |
|                              | Describes groups of pathological processes, their etiopathogenetic mechanisms and connects knowledge about the pathological structure and function of organs, organ systems and whole body.                                                                                                                                                                                                                                                                                                                                                                    |             | IU-MFMSE501-1                | IU-MSE2<br>IU-MSE4                 |          |
|                              | Describes and connects knowledge about the most important pathological changes in organ systems with features of pathological processes, morphological characteristics specific to individual organ systems, and applies this knowledge in clinical examples.                                                                                                                                                                                                                                                                                                  |             | IU-MFMSE501-2                | IU-MSE3<br>IU-MSE4                 |          |
|                              | Describes disorders of the structure and function of organs and organ systems (morphological changes).                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             | IU-MFMSE501-3                | IU-MSE4                            |          |
|                              | Describes certain methods of morphological diagnosis and their clinical use, as well as signs of death and features of certain stages of autopsy.                                                                                                                                                                                                                                                                                                                                                                                                              |             | IU-MFMSE501-4                | IU-MSE4<br>IU-MSE5                 |          |
|                              | Recognizes and describes typical macroscopic changes in individual tissues and organs (pathological processes from general and organic pathology) and, based on their characteristics, thinks through differential diagnosis and creates a diagnosis.                                                                                                                                                                                                                                                                                                          |             | IU-MFMSE501-5                | IU-MSE6                            |          |
|                              | Shows and describes the technique of microscopy of pathohistological preparations, critically analyzes histochemical and immunohistochemical methods and uses them in the diagnosis of diseases.                                                                                                                                                                                                                                                                                                                                                               |             | IU-MFMSE501-6                | IU-MSE8                            |          |
|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                              |                                    |          |
| Prerequisites for the course | In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                              |                                    |          |

| enrolment      |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Course content | Week / shift                | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                | Lectures<br>And<br>Seminars | <p>(L1, S1) Overview of cellular responses to stress and noxious stimuli, Causes of cell injury, Sequence of events in injury and cell death.</p> <p>(L2, S2) Mechanisms of cell injury and cell deaths, Cellular adaptations to stress, Intracellular accumulations, Pathologic calcification, Cellular aging.</p> <p>(L3, S3) Overview of inflammation, definitions and general features, Causes of inflammation, Recognitions of microbes and damaged cells, Acute inflammation, Mediators of inflammation.</p> <p>(L4, S4) Morphologic patterns of acute inflammation, Outcomes of acute inflammation, Chronic inflammation, Systemic effects of inflammation, Tissue repair.</p> <p>(L5, S5) Hyperemia and congestion; Edema; Hemorrhage, Hemostasis and thrombosis: Thrombosis, Embolism, Infarction, Shock.</p> <p>(L6, S6) The normal immune response, Cells and tissues of the immune system, Overview of lymphocyte activation and adaptive immune responses, Hypersensitivity: Immunologically mediated tissue injury, Rejection of transplants.</p> <p>(L7, S7) Autoimmune diseases, Immunodeficiency syndromes, Acquired immunodeficiency syndrome, Amyloidosis.</p> <p>(L8, S8) Nomenclature, Characteristics of benign and malignant neoplasms, Epidemiology, Cancer genes, Genetic lesions in cancer, Carcinogenesis: a multistep process.</p> <p>(L9, S9) Hallmarks of cancer: Self-sufficiency in growth signals; Insensitivity to growth inhibitor signals: tumor suppressor genes, Sustained angiogenesis; Clinical aspects of neoplasia.</p> <p>(L10, S10) Marfan syndrome, Ehlers-Danlos syndrome; Familial Hypercholesterolemia, Cystic fibrosis; Phenylketonuria; Complex multigenic disorders; Trisomy 21, Klinefelter syndrome, Turner syndrome; Triplet repeat mutations: Fragile x syndrome; Congenital anomalies; Perinatal infections, prematurity and fetal growth restrictions, RDS, Necrotizing enterocolitis, SIDS, Fetal hydrops, Tumors and tumor like lesions of infancy and childhood.</p> <p>(L11, S11) Structure and function of blood vessels, Congenital anomalies, Hypertensive vascular disease, Vascular wall response to injury, Arteriosclerosis, Atherosclerosis, Aneurysms and dissections, Vasculitis, Disorders of blood vessels hyper reactivity, Veins and lymphatics, Tumors.</p> <p>(L12, S12) Heart failure, Congenital heart diseases, Ischemic heart diseases, Arrhythmias.</p> <p>(L13, S13) Hypertensive heart disease, Valvular heart disease, Cardiomyopathies and myocarditis, Pericardial disease, Cardiac tumors.</p> <p>(L14, S14) Atelectasis (Collapse); ARDS; Obstructive vs Restrictive pulmonary diseases; Obstructive lung (airway) diseases; Chronic interstitial (Restrictive infiltrative) lung diseases; Pulmonary diseases of vascular origin.</p> <p>(L15, S15) Pulmonary infections; Lung tumors; Pleural lesions; Lesions of the upper respiratory tract.</p> <p>(L16, S16) Red cell disorder; Bleeding disorders; Complication of transfusion; Disorders of the spleen and thymus.</p> <p>(L17, S17) White cell disorders.</p> <p>(L18, S18) Acute Inflammatory dermatoses; Chronic Inflammatory dermatoses; Infectious dermatoses; Blistering (Bullous) disorders; Tumors of the skin.</p> <p>(L19, S19) Oral cavity, Esophagus, Stomach.</p> <p>(L20, S20) Small and large intestine, Appendix.</p> <p>(L21, S21) General features of liver diseases, Infectious disorders, Autoimmune hepatitis, Drug and toxin induced liver injury, Alcoholic and non-alcoholic fatty liver disease, Inherited metabolic liver diseases.</p> <p>(L22, S22) Cholestasis syndromes; Circulatory disorders; Nodules and tumors; Gallstone diseases; Cholecystitis; Carcinoma of the gallbladder.</p> <p>(L23, S23) Congenital anomalies; Pancreatitis; Pancreatic neoplasms.</p> <p>(L24, S24) Clinical manifestations of renal diseases; Glomerular diseases.</p> |

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|  |           | <p>(L25, S25) Diseases affecting tubules and interstitium; Diseases involving blood vessels; Chronic kidney diseases; Cystic diseases of the kidney; Urinary outflow obstruction; Congenital and developmental anomalies; Neoplasms.</p> <p>(L26, S26) Basic structure and function of the bone; Congenital disorders of Bone; Metabolic disorders of Bone; Paget disease of bone; Fractures; Osteonecrosis; Osteomyelitis; Bone tumors and tumor like lesions.</p> <p>(L27, S27) Joints; Soft tissue tumors, Disorders of neuromuscular junction: Myasthenia gravis, Lambert-Eaton syndrome page; Disorders of skeletal muscle: Dystrophies: Duchenne and Becker Muscular Dystrophy page; Peripheral nerve sheet tumors: Schwannomas and Neurofibromatosis Type 2, Neurofibromatosis Type I, Malignant peripheral nerve sheet tumors.</p> <p>(L28, S28) Clinical presentations of breast disease; Inflammatory processes; Stromal neoplasms; Benign epithelial lesions; Carcinoma.</p> <p>(L29, S29) Penis; Scrotum, testis and epididymis; Prostate; Ureter, Bladder and Urethra; Sexually transmitted diseases.</p> <p>(L30, S30) Vulva; Vagina; Cervix; Uterus.</p> <p>(L31, S31) Fallopian tubes; Ovaries; Diseases of pregnancy.</p> <p>(L32, S32) Thyroid; Parathyroid glands.</p> <p>(L33, S33) Pituitary; Endocrine pancreas; Adrenal cortex; Adrenal medulla; Multiple Endocrine Neoplasia Syndromes.</p> <p>(L34, S34) Edema; Herniation and hydrocephalus; Cerebrovascular diseases; Central nervous system trauma; Congenital malformation and perinatal brain injury; Infections of the Nervous system.</p> <p>(L35, S35) Genetic metabolic diseases; Acquired metabolic and toxic disturbances; Neurodegenerative diseases; Tumors.</p> |
|  | Exercises | <p>(E1) Cell Injury, Cell Death, and Adaptations I</p> <p>(E2) Cell Injury, Cell Death, and Adaptations II</p> <p>(E3) Inflammation and Repair I</p> <p>(E4) Inflammation and Repair II</p> <p>(E5) Hemodynamic Disorders, Thromboembolism and Shock</p> <p>(E6) Diseases of the Immune System I</p> <p>(E7) Diseases of the Immune System II</p> <p>(E8) Neoplasia I</p> <p>(E9) Neoplasia II</p> <p>(E10) Genetic and Pediatric Diseases</p> <p>(E11) Blood Vessels</p> <p>(E12) Heart I</p> <p>(E13) Heart II</p> <p>(E14) Lung I</p> <p>(E15) Lung II</p> <p>(E16) The Hematopoietic and Lymphoid System I</p> <p>(E17) The Hematopoietic and Lymphoid System II</p> <p>(E18) The Skin</p> <p>(E19) Oral Cavities and GI Tract I</p> <p>(E20) Oral Cavities and GI Tract II</p> <p>(E21) The Liver and Biliary System I</p> <p>(E22) The Liver and Biliary System II</p> <p>(E23) The Pancreas</p> <p>(E24) Kidneys and its Collecting System I</p> <p>(E25) Kidneys and its Collecting System II</p> <p>(E26) Bones and Joints I</p> <p>(E27) Bones and Joints II</p> <p>(E28) The Breast</p> <p>(E29) The Male Genital System and Lower Urinary Tract</p> <p>(E30) The Female Reproductive System I</p> <p>(E31) The Female Reproductive System II</p> <p>(E32) The Endocrine System I</p> <p>(E33) The Endocrine System II</p> <p>(E34) The Nervous System I</p>                                                                                                                                                                                                                                                                                                                                                                                |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                              | (E35) The Nervous System II                        |                            |                   |         |                     |              |                    |           |        |       |
| Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | English                                                                                                                                                                                                                      |                                                    |                            |                   |         |                     |              |                    |           |        |       |
| E-learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Classes are conducted 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 of 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/<br>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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                              |                                                    |                            | 210               |         | 7                   |              |                    |           |        |       |
| Pre-exam/partial written exam (P1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                              | IU- MFMSE501-1<br>IU- MFMSE501-2<br>IU- MFMSE501-5 |                            | 135               |         | 4.5                 |              | 50%                |           |        |       |
| Pre-exam/partial written exam (P2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                              | IU- MFMSE501-3<br>IU- MFMSE501-4<br>IU- MFMSE501-6 |                            | 135               |         | 4.5                 |              | 50%                |           |        |       |
| In total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                              |                                                    |                            | 480               |         | 16                  |              | 100%               |           |        |       |
| Method of calculating the final grade                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                              |                                                    |                            |                   |         |                     |              |                    |           |        |       |
| The final grade is obtained as the arithmetic mean of the grades from the two partial exams (sum of grades from P1 and P2 divided by 2). 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Kumar V, Abbas A, Aster J: Robbins Basic Pathology, 10th edition, Elsevier, 2017.                                                                                                                                            |                                                    | X                          |                   | X       |                     |              | X                  |           |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | The Internet Pathology Laboratory for Medical Education courtesy of Prof. Edward C. Klatt, MD, Mercer University School of Medicine available on <a href="https://webpath.med.utah.edu/">https://webpath.med.utah.edu/</a> . |                                                    | X                          |                   | X       |                     |              |                    |           |        | X     |
| Additional                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Power point presentations used during lectures and seminars.                                                                                                                                                                 | X                                                  | X                          |                   | X       |                     |              |                    |           |        | X     |
| Additional course information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                              |                                                    |                            |                   |         |                     |              |                    |           |        |       |
| <b>Teaching in Pathology</b> for each unit begins with lectures (L), followed by seminars (S) and exercises (E), according to the topic headings determined for that day. At the seminars, students are given problem tasks (case presentation) which they solve in small groups, at the end of the seminar, knowledge is checked through a quiz-test, and then the correct answers are discussed with explanations of the problem tasks. During the exercises, students examine macroscopic and microscopic images of diseased organs with the help of a computer program, and with a macroscopic examination of diseased organs at the Department of Pathology of UCC Mostar, they independently examine diseased organs. Students also attend the performance of autopsies. The lectures and seminars cover the same teaching units. Students should |                                                                                                                                                                                                                              |                                                    |                            |                   |         |                     |              |                    |           |        |       |

thoroughly study the prescribed material before the seminar. Seminars or practices from which students were absent must be made up, as they are a condition for sitting the partial and final exams.

**The exam** is taken in two parts: the first partial test P1 includes general pathology, pathology of blood vessels, heart, respiratory system, blood and blood-forming organs and skin, and the second partial test P2 the remaining part of the pathology of organs and organ systems. Each partial test has 100 questions in the theoretical part. To pass a particular test, it is necessary to achieve 60 correct answers (60% of the solved test).

Test scores and grades: 60-70 sufficient, 71-80 good, 81-90 very good and 91-100 excellent. At the end of each part of the tour, a written exam P1 and P2 is organized. Students are required to pass both partial tests to be able to get final grade. The passed written exam is valid only during the current academic year.

**The final grade** is calculated as the arithmetic mean of the grades obtained on the two partial exams that is:  $(P1+P2)/2$ .