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| **Course title** | **Code** | **Semester** | **Type of course** | **Course volume (Contact hours)** | **ECTS** |
| **Musculoskeletal System**  | **MED****1005** | **I** | **Mandatory** | **135** | **7** |
| **Faculty, the educational program and level of education** | * School of Medicine and Health Sciences
* Higher Medical Educational Program “Medicine”
* One cycle 6-year
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| **Learning Course Content** |
| * **Anatomy** Vertebral Column, Sacral bone, Coccygeal Bone, Sternum, Ribs (costae); General overview of the cranium; Cranial bones (frontal, parietal, occipital, temporal,sphenoid and ethmoidal bones). Facial bones - Maxilla, Mandible, Zygomatic bone, Lacrimal bone, Nasal Bones ; Palatine Bone, Vomer, Hyoid Bone. Appendicullar skeleton: Scapula, Clavicula, Humerus, Radius, Ulna and Skeleton of the hand; Coxal Bone, Femor, tibia, fibulla, foot.
* **Radiologic Anatomy** Bone Imaging, Images of the Vertebral column, Sacral Bone; Sternum and Costae; Images of the Skull Upper and lower extremity joints, ARTHROGRAPHY
* **Embryology** Formation of somites. Embryonic folding
* Histology Histology of connective tissue;
* **Physiology** Molecular mechanism of skeletal muscle contraction
* **Biochemistry** Extracellular matrix biochemistry.Chemical composition of bone. Role of parathyroid hormone, vitamin D and Calcitonin in bone metabolism.Mineralization disorders.
* **Biophysics** Bioelectogenesis Biomechanics of muscle contraction.
* **PBL**
* **Anatomy** Joints : Shoulder joint, elbow (cubital) joint; Radioulnar Articulation (Distal+Proximal), Wrist joints, finger joints.

Hip joint, knee joint. Pelvis: structure, articulations, and diameter. Temporamandibular joint, Atlanto-occipital joint, atlantoaxial joint, the intervertebral joint. Costovertebral joint, sternocostal joint, sternoclavicular joint, acromioclavicular joint.* **Embryology** Development of Bone and Cartilage. Intramembranous Ossification. Endochondral OssificationDevelopment of Joints. Fibrous Joints. Cartilaginous Joints.
* **Histology** Histology of Cartilage
* **Cadaver LAB**
* **Physiology** Neuron-Transmission in Neuromuscular Junction, Neuromuscular junction, excitation & contraction coupling
* **Biochemistry** Cartilage - Chemical Composition - Collagens, Proteoglycans. COX and arthritis.
* **Biophysics** Registration of biopotentials and methods of preclinical electrophysiological studies.Clinically applied methods of biopotentials registration: EEG, ECG, EMG, ERG
* **Clinical skills** Intramuscular injection
* **Anatomy** Superficial and Deep Muscles of the Back; Muscles of the neck (deep and superficial, antero-lateral, Suprahyoid and infrahyoid Muscles). Muscles of the Shoulder; Muscles of arm, forearm and hand (anterior and posterior compartments).
* **Embryology** Development of Axial Skeleton
* **Histology** Histology of bone;
* **Cadaver LAB** Muscle and joınts
* **Biochemistry** Organization of the Sarcomere; Proteins of the Myofilament. Organization of Actin Thin Filaments; Myosin and the Power Stroke of Contraction;
* **Physiology** Whole muscle contraction; Skeletal Muscle Energy Metabolism;
* **Anatomy** Gluteal muscles; Muscles of the Thigh (posterior,anterior and medial compartments), Muscles of the Leg ( posterior, anterior and medial compartments).
* **Embryology** Development of Appendicular Skeleton. Development of Muscular System. Clinically Oriented Problems.
* **Histology** Histology of Muscle
* **Cadaver LAB** Muscle and joınts
* **Biochemistry** The Dystrophin Complex.Biochemistry of muscle contraction.
* **Physiology** Lab: Electromyography; Observe and record skeletal muscle tonus as reflected by a basal level of electrical activity associated with the muscle in the resting state. Analyse the data.
* **Anatomy** Muscles of the pectoral region; Thoracic muscle - respiratory muscles, Axio-appendicular muscles, Diaphragm. Muscles of the anterior abdominal wall). Facial Muscles ( The Mimic and Mastications Muscles),
* **Cadaver** LAB Muscle and joınts
* **Biochemistry** Adrenergic Receptors in Muscle Functions; Acetylcholine and Receptors in Muscle Functions Regulation of Sarcoplasmic Calcium; Muscle Relaxation.The Muscular Dystrophies; Lipoproteins
* **Physiology** Exercise, muscle hypertrophy and atrophy
* **Clinical visits** collecting clinical cases from the hospital
* **PBL**
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| **Textbooks and Materials** |
| * Elsevier's Integrated Anatomy and Embryology- Bogart Bruce Ian; Ort Victoria; Mosby Elsevier; 2007;
* Human Anatomy-Elaine N. Marieb; Pearson; 8th ed.; 2017;
* Sobotta Atlas of Human Anatomy.Tables of Muscles, Joints,and Nerves-F.Paulsen;J.Waschke; Urban & Fischer; 16st. edition; 2018.
* Rad. Anatomy
* Learning Radiology: Recognizing the Basics -William Herring. Elsevier Mosby; 2nd ed. 2012;
* Biochemistry
* Biochemistry : Lippincott illustrated reviews - Ferrier, Denise R; Wolters Kluwer; 7 th. ed. 2017;
* Marks' basic medical biochemistry: a clinical approach- Lieberman, Michael; Wolters Kluwer Health; 4th.ed. 2018
* Cytology
* Histology and cell biology: an introduction to pathology- Elsevier Saunders; 5rd.ed; 2020;
* Embryology
* The Developing Human: Clinically Oriented Embryology - Keith Moore L; Persaud T.V.N;Mark G Torchia; Elsevier Saunders. 11th ed. 2020;
* Microbiology
* Microbiology: lippincott's illustrated reviews; Wolters Kluwer Health; 4 th.ed. 2020
* Review of Medical Microbiology and Immunology-Levinson, Warren; Mc- Graw Hill education Medical; 17th ed. 2022;
* Biophysics
* Biological and Medical Physics- Tamar Sanikidze; West Pomeranian University of Technology ; V-1/ V-2. 2016
* MOLECULAR BIOLOGY/GENETICS
* Molecular Biology of the Cell - Bruce Alberts, Alexander Johnson; Garland Science; 7th ed. 2022;;
* Evidence Based Medicine-EBM
* The Philosophy of Evidence-Based Medicine- Jeremy, Howick; Wiley –Blackwell; 2011;
* Histology
* Junqueira's Basic Histology : Text and Atlas- Anthony L. Mescher; McGraw Hill Education; 16th Ed. 2021;
* Physiology
* Guyton and Hall textbook of medical physiology- Hall, John E; Elsevier; 14th.ed. 2021;
* Elsevier's Integrated Physiology- Robert G. Carroll; Mosby Elsevier; 2007;
* Lehninger principles of biochemistry-David L.Nelson ;Michael M.Cox W.H. Freeman and Company; 6h.ed. 2013;
* Textbook of Biochemistry with Clinical Correlations- Thomas M. Devlin; John Wiley & Sons, Inc. 7th.ed. 2011;
* Harper's Illustrated Biochemistry- Robert Murray;David A.Bender; Mc Graw Hill education Medical; 29th.ed. 2012;
* Problem-Based Physiology- Robert G. Carroll; Elsevier Sounders; 1st.ed. 2010;
* Physics in Biology and Medicine-Pual Davidovits; Elsevier; 40th.ed. 2013;
* Jawetz,Melnick &Adelberg's medical microbiology-G.F.Brooks;K.C.Carroll;J.S.Butel; Mc Graw Hill education Medical; 26th.ed. 2013;
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