International School of Medicine / Medicine (English)

2023 - 2024 Academic Year

Nervous System

Syllabus

Course Description					
Name	**Code**	**Semester**	**T+A Hour**	**Credit**	**ECTS**
Nervous System	07. Committee	Fall Semester	127+22	0	10

Prerequisites Courses	
Recommended Elective Courses	
Language of Instruction	English
Course Level	First Cycle (Bachelor's Degree)
Course Type	Committee
Course Coordinator	Assoc.Prof. Ali Timuçin ATAYOĞLU
Name of Lecturer(s)	Assoc.Prof. Ali Timuçin ATAYOĞLU
Assistant(s)	
Aim	To have a knowledge about the structures and functions of the central nervous system, to understand the basic function of the nervous system and to have knowledge about the common diseases related to the nervous system with a multidisciplinary point of view
Course Content	This course contains; PHYSIOLOGY: Physiology of musculoskeletal system, Physiology of blood and circulatory system, Physiology of respiratory and digestive system, Physiology of nervous system and sensory system, Endocrine and urogenital system physiology.,ANATOMİ: Sinir sistemi hakında genel bilgi, Fossa axillaris, Plexus brachialis about nervous ,Sinir sistemine giriş, Medulla spinalis, Çıkan-İnen yollar, Medulla spinalis sendromları, Brakiyal pleksusun klinik anatomisi, Lumbal ve sakral pleksus, Plexus lumbalis ve plexus sacralis'in klinik anatomisi, Plexus cervicalis, Beyin sapı, Kranial sinirler 1-6 Kranial sinirler 7-12, Diencephalon, Cerebellum, Limbik sistem, Telencephalon diencephalon, cerebellum, limbic system, telecephalon , Beyin ventrikülleri, BOS, MSS zarları Beyin venöz sinüsleri, Serebrovasküler hastalıklar, Beyin sapı sendromları, MSS damarları, Otonom sinir sistemi.,HISTOLOGY: Congenital malformations, Histopathology, Body cavities, Diaphragm and embryonic development of body cavities, Head and neck embryology, Musculoskeletal system embryology, Extremity development, Blood histology, Hematopoiesis, Cardiovascular system histology, Skin histology, Skin and appendix development, Cardiovascular system embryology histology of lymphoid system, embryology of lymphoid system, histology of respiratory system, respiratory system embryology, digestive system histology: digestive tract digestive system histology: digestive tract, embryology, integumental system embryology, nervous system histology and embryology, histology and embryology of specialized senses , Digestive System Histology, Digestive Glands Histology, Digestive System Embryology, Endocrine System Histology, Endocrine System Embryology, Urinary System Histology, Urinary System Embryology, Female Genital System em histology, Male genital system histology.,Physiopathology Physiopathology of the musculoskeletal system Physiopathology of the blood and circulation Physiopathology of the respiratory and digestive system Physiopathology of the nervous system and sensory organs Physiopathology of the endocrine and urogenital system.,Biophysics: General structure of nerve cells, membrane structure and properties of nerve cells, action potential in neurons, signal transduction, neurotransmitter materials and their effects on cells directly and indirectly, muscle biophysics and dynamics, structure of skeletal muscle cells, Nerve system, Nerst equation, Goldman equation, Vision biophysics and optic laws, Hearing biophysics and sound waves, Radiation biophysics: Radiation biopsy (particle and wave), Radiation biophysics, X-ray working principles, MR, fMRI, PET working principles, EEG, Olay Potentials, EEG, microwave and radio waves, ultrasound, visible rays, cosmic rays, Gamma rays, , Oscillations related to Olay..

Course Learning Outcomes	**Teaching Methods**	**Assessment Methods**
Counts the differences between thick and thin skin histology.		
Explains the histological structure of the epidermis and counts its layers.		
Explain the morphological features of keratinocytes.		
Explain the structural features and functions of cells in the epidermis.		
Explain the histological structure and vascularization of the dermis.		
Explains the dermis innervation (nervous stimulation).		
Explain the histological structures and functions of eccrine and apocrine sweat glands.		
Counts the locations and properties of Sabese glands.		
Explain the histology of the erector pili muscle.		
Explain the histological structure of the hair follicle.		
Explain the nail histology.		
Explain the histological structure of the mammary gland.		
Establishes the characteristics of the skin and its appendages and their relations with the clinic.		
Interprets the preparations and images about the skin and its appendages.		
Explain the development of the skin and its appendages.		
Counts the clinical conditions related to the skin and its appendages.		
Histologically distinguish the brain, cerebellum and spinal cord.		
Explain the cerebellum cortex and its layers.		
It explains the cells in the cerebellar cortex and the synapses they make.		
Explain the histological structure of the cerebellum medulla.		
Explain the histological structure of cerebral cortex and medulla.		
Counts the types and characteristics of neurons in the brain and explains them together with their synapses.		
Describe the cellular features of the choroid plexus.		
Explain the histological structure of the medulla spinalis cortex and medulla.		
Explain the locations of motor and sensory neurons.		
Defines the histological structure of the central canal.		
Defines the blood nerve barrier.		
Explain the histological features and differences of meninges.		
Interprets preparations and images related to the central nervous system.		
Explain the organization of peripheral nerves.		
Defines ganglia.		
Counts the differences of cranio-spinal and autonomic (motor) ganglia.		

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Interprets preparations and images related to peripheral nerves.		
Explain the differentiation of neural ectoderm.		
Explain the formation of the neural tube.		
Explain the formation of different brain regions from the neural tube.		
Explain the origin and differentiation of neurons and glial cells.		
Explain the origin, differentiation and embryonic development of medulla spinalis, pons, medulla, cerebrum and cerebellum.		
Explain the origins and embryonic development of meninges and choroid plexus.		
Explain the origin and embryonic development of peripheral nerve ganglia.		
Explain the origin and embryonic development of peripheral nerves.		
Counts the names of the layers of the eye and explains histological features.		
Counts the names of the layers of the sclera and explains the histological features.		
Counts the names of the layers of the cornea and explains the histological features.		
Explains the structure of the limbus cornea and interprets the clinical significance of the shim duct.		
Counts the layers of the choroid, ciliary body and iris and explains the histological features.		
Counts the layers of the retina and explains the organization of its cells.		
Explains the names and histological features of cells in the retina.		
Explain the histological features and functions of specialized regions in the retina.		
Explain the histological structure of the lens and interpret its clinical significance.		
Explain the histological structure of the conjunctiva.		
Explain the layers and histological structures of the eyelids.		
Defines glands located on eyelids.		
Explain the function of eyelid muscles and tarsal plate.		
Explains the organization of tear glands and ducts and explains the histology of structures in the tear system.		
Interprets eye preparations and images.		
Counts the ear parts and structures.		
Explain the histological structure of the outer ear, ear canal and eardrum.		
Explain the histological structure of the middle ear.		
Explain the histological structure of the Eustachian tube.		
Defines the bony and membranous labyrinth structures in the inner ear.		
Explain the histology of structures found in the bony and membranous labyrinth.		
Explain the cells in the organ of Corti and the histology of the organ of Corti.		
Interprets preparations and images related to the ear.		
Counts the tissues from which the eye originates.		
Explains eye development.		
Defines the malformations seen in the eye.		
Explain the structures from which the inner ear, middle ear and outer ear originate.		
Explain the development of inner ear, middle ear and outer ear.		
Defines congenital anomalies related to ear.		

Teaching Methods	
Assessment Methods	

Lecture Schedule

Sequence	Topics	Preliminary Preparation
1	PHYSIOLOGY: Physiology of musculoskeletal system, Physiology of blood and circulatory system, Physiology of respiratory and digestive system, Physiology of nervous system and sensory system, Endocrine and urogenital system physiology.	-
2	ANATOMİ: Sinir sistemi hakında genel bilgi, Fossa axillaris, Plexus brachialis about nervous ,Sinir sistemine giriş, Medulla spinalis, Çıkan-İnen yollar, Medulla spinalis sendromları, Brakiyal pleksusun klinik anatomisi, Lumbal ve sakral pleksus, Plexus lumbalis ve plexus sacralis'in klinik anatomisi, Plexus cervicalis, Beyin sapı, Kranial sinirler 1-6 Kranial sinirler 7-12, Diencephalon, Cerebellum, Limbik sistem, Telencephalon diencephalon, cerebellum, limbic system, telecephalon, Beyin ventrikülleri, BOS, MSS zarları Beyin venöz sinüsleri, Serebrovasküler hastalıklar, Beyin sapı sendromları, MSS damarları, Otonom sinir sistemi.	-
3	HISTOLOGY: Congenital malformations, Histopathology, Body cavities, Diaphragm and embryonic development of body cavities, Head and neck embryology, Musculoskeletal system embryology, Extremity development, Blood histology, Hematopoiesis, Cardiovascular system histology, Skin histology, Skin and appendix development, Cardiovascular system embryology histology of lymphoid system, embryology of lymphoid system, histology of respiratory system, respiratory system embryology, digestive system histology: digestive tract digestive system histology: digestive tract, embryology, integumental system embryology, nervous system histology and embryology, histology and embryology of specialized senses , Digestive System Histology, Digestive Glands Histology, Digestive System Embryology, Endocrine System Histology, Endocrine System Embryology, Urinary System Histology, Urinary System Embryology, Female Genital System em histology, Male genital system histology.	-

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Lecture Schedule		
Sequence	**Topics**	**Preliminary Preparation**
4	Physiopathology Physiopathology of the musculoskeletal system Physiopathology of the blood and circulation Physiopathology of the respiratory and digestive system Physiopathology of the nervous system and sensory organs Physiopathology of the endocrine and urogenital system.	-
5	Biophysics: General structure of nerve cells, membrane structure and properties of nerve cells, action potential in neurons, signal transduction, neurotransmitter materials and their effects on cells directly and indirectly, muscle biophysics and dynamics, structure of skeletal muscle cells, Nerve system, Nerst equation, Goldman equation, Vision biophysics and optic laws, Hearing biophysics and sound waves, Radiation biophysics: Radiation biopsy (particle and wave), Radiation biophysics, X-ray working principles, MR, fMRI, PET working principles, EEG, Olay Potentials, EEG, microwave and radio waves, ultrasound, visible rays, cosmic rays, Gamma rays, , Oscillations related to Olay.	-

Evaluation Methods	**Weight(%)**
Midterm Exam	60
General Exam	40

Resources

Clinical neuroanatomy. Snell, Richard S. Lippincott Williams & Wilkins, 2010.
Gray's clinical neuroanatomyMancall, Elliott L., and David G. Brock. . Elsevier Health Sciences, 2011. Pathophysiology: Concepts of Altered Health States - Carol Mattson Porth Essential Concepts in Molecular Pathology - William B. Coleman
Pathophysiology - FUunctional Alterations in Human Health, Carie A. Braun..Tıbbi Fizyoloji – Guyton, Ganong's Review of Medical Physiology, Molecular Biology of the cell – Alberts, Principles of Neural Science.....Biyofizik, Ferit Pehlivan, Hacettepe Taş Kitapevi. Nörobiyofizik, Ferhan Esen-Hamza Esen, Ankara Nobel Tıp Kitapevi, Biopysics Roland Glaser.....Gartner L.P., Hiatt J.L.: Color Text Book of Histology. Second ed. SAUNDERS.

Moore K.M., Persaud T.V.N. Çev. Ed: Yıldırım M., Okar İ., Dalçık H. Klinik Yönleri ile İnsan Embriyolojisi. 6. Ed. NOBEL TIP

Sadler T.W: Langman's Medical Embryology, Eleventh Edition. Lippincott Williams & Wilkins, USA

Schoenwolf G.C.: Larsen's Human Embryology. 4. Ed. CHURCHILL LIVINGSTONE ELSEVIER

Stevens A., Human Histology, Third Ed.
Junqueira L.C., Carneiro J. Çev. Ed: Aytekin Y, Solakoğlu S.: Temel Histoloji. NOBEL TIP

Gartner L.P., Hiatt J.L.: Color Atlas of Histology, Fifth Edition. Lippincott Williams & Wilkins, USA

Welsch U. Çev. Ed.: Tekelioğlu M.: Sobotta Histoloji Atlası. BETA

Moore K.M., Persaud T.V.N. Çev. Ed: Yıldırım M., Okar İ., Dalçık H. Klinik Yönleri ile İnsan Embriyolojisi. 6. Ed. NOBEL TIP
Power Point slidesMedical Physiology – Guyton Ganong's Review of Medical Physiology Molecular Biology of the cell - Alberts Principles of Neurological Sciences - Kandel Color Atlas of Physiology Color Atlas of Pathophysiology

-Moore K, AF. Dalley: Clinically oriented anatomy. Seventh ed. Lippincot Williams &Wilkins Company, Philadelphia, 2013- Drake, Richard, A. Wayne Vogl, and Adam WM Mitchell. Gray's anatomy for students. Elsevier Health Sciences, 2014. -Netter FH. Atlas of human anatomy (second edition). USA, Novartis, 1997: 268. -Putz R, Pabst R. Sobotta atlas of human anatomy Volume 2 12th English Ed. Munich, Urban & Schwarzenberg 1994: 165.

Junqueira L.C., Carneiro J. Çev. Ed: Aytekin Y, Solakoğlu S.: Temel Histoloji. NOBEL TIP Gartner L.P., Hiatt J.L.: Color Atlas of Histology, Fifth Edition. Lippincott Williams & Wilkins, USA Welsch U. Çev. Ed.: Tekelioğlu M.: Sobotta Histoloji Atlası. BETA Moore K.M., Persaud T.V.N. Çev. Ed: Yıldırım M., Okar İ., Dalçık H. Klinik Yönleri ile İnsan Embriyolojisi. 6. Ed. NOBEL TIP
Pathophysiology: Concepts of Altered Health States - Carol Mattson Porth 2. Essential Concepts in Molecular Pathology - William B. Coleman 3. Pathophysiology - FUunctional Alterations in Human Health, Carie A. Braun 4. Pathophysiology of Heart Disease: A Collaborative Project of Medical Students and Faculty, 6th ed. Leonard S. Lilly (ed). Wolters Kluver, 2016. 5. Guyton and Hall Textbook of Medical Physiology, 13th ed. John E. Hall (ed). Elsevier, 2016.
Power Point slides