

USKUDAR UNIVERSITY
VOCATIONAL SCHOOL OF HEALTH SERVICES
ELECTRONEUROPHYSIOLOGY
PROGRAM

GENERAL INFORMATIONS ABOUT THE PROGRAM

The purpose of the program educate electroneurophysiology technicians using neurophysiological methods needed for analysis of cognitive and behavioral functions in brain and determination of the diseases constituted by distruption of these functions via supervision of specialist doctors.

Students graduated from Electroneurophysiology Program receive an associate diploma and the title of Healthy technicians (Electroneurophysiology technicians). Electroneurophysiology is an important field of Neurology and Physiology. The students choosing this vocation should have the highest level of vocational performance and investigation desire.

Alumni can work electroencephalography, evoked potentials and sleep units of polyclinics in public or private hospital via supervision of neurology, otorhinolaryngology, psychiatry, pediatrics, chest diseases and physiology specialists. In addition, they can work in scientific researches supported by national and international funds in universities as electroneurophysiology technicians.

Brain diseases and Cardiovascular diseases compose the disease group having the most studies and the most patients. Therefore, Electroneurophysiology technicians working in hospital and polyclinics are highly needed in our country.

Also high-budget electroneurophysiology studies are made as international or national. The technicians working in these studies and educated about electroneurophysiology are needed for both The European Union projects and national projects. The students choosing to be investigator can do vertical transfer. Students can join to English prep program as optional.

The period of study of Electroneurophysiology program is 2 years. Students receive training about Physiology, Cognitive Neurophysiology, Anatomy, Electroneurophysiology, Neurology.

COURSE PROGRAM

I.YEAR FALL TERM (01 SEMESTER)

COURSE CODE	COURSE NAMES	THEORETICAL	PRACTICE	CREDIT	ECTS CREDIT
FZY101	PHYSIOLOGY	2	0	2	2
MYO103	BASIC ANATOMY	2	0	2	2
ENF119	ELECTROENCEPHALOGRAPHY-EEG (BSEC)	2	2	3	8
FAR103	BASIC PHARMACOLOGY	2	0	2	2
MYO003	MEDICAL TERMINOLOGY	2	0	2	2
ENF123	NEUROPHYSIOLOGICAL DEVICE AND EQUIPMENT TECHNOLOGIES	2	0	2	4
RKUL101	UNIVERSITY CULTURE I (USEC)	0	2	1	1
İNGU101	ENGLISH I *	3	0	3	3
TURK101	TURKISH LANGUAGE I *	2	0	2	3
ATA101	ATATURK'S PRINCIPLES AND HISTORY OF TURKISH REVOLUTION I *	2	0	2	3
TOTAL		19	4	21	30

* Will be given in the form of distance education.

I.YEAR SPRING TERM (02 SEMESTER)

COURSE CODE	COURSE NAMES	THEOR ETICAL	PRACTICE	CREDIT	ECTS CREDIT
ENF102	COGNITIVE NEUROPHYSIOLOGY I (BSEC)	2	0	2	4
ENF104	NEUROLOGY I	2	0	2	4
ENF120	SLEEP EEG AND PSG	2	4	4	4
ENF124	NERVE AND MUSCLE ANATOMY	2	2	3	3
ENF118	BIOPHYSICS	2	0	2	2
RPSI209	POSITIVE PSYCHOLOGY AND COMMUNICATION SKILLS	2	0	2	3
RKUL102	UNIVERSITY CULTURE II (USEC)	0	2	1	1
İNGU102	ENGLISH II *	3	0	3	3
TURK102	TURKISH LANGUAGE II *	2	0	2	3
ATA102	ATATURK'S PRINCIPLES AND HISTORY OF TURKISH REVOLUTION II *	2	0	2	3
TOTAL		19	8	23	30

* Will be given in the form of distance education.

II. YEAR FALL TERM (03 SEMESTER)

COURSE CODE	COURSE NAMES	THEOR ETICAL	PRACTICE	CREDIT	ECTS CREDIT
ENF211	COGNITIVE NEUROPHYSIOLOGY II (BSEC)	2	0	2	5
ENF213	NEUROLOGY II	2	0	2	5
ENF219	ELECTROMYOGRAP HY-EMG	2	8	6	12
ILK101	FIRST AID (BSEC)	2	0	2	3
SAH101	HEALTH LAW (BSEC)	2	0	2	3
TOTAL		10	8	14	28

II. YEAR SPRING TERM (04 SEMESTER)

COURSE CODE	COURSE NAMES	THEOR ETICAL	PRACTICE	CREDIT	ECTS CREDIT
ENF208	SOMATOSENSORY EVOKED POTENTIALS	2	0	2	5
ENF222	CLINICAL ELECTRONEUROPHYS IOLOGY PRACTICES	2	16	10	13
MET101	OCCUPATIONAL ETHICS	2	0	2	2
HLK101	PUBLIC HEALTH (BSEC)	2	0	2	3
ENF999	SUMMER INTERNSHIP	0	(20 Work Day)	0	9
TOTAL		10	16	16	32

COURSE DESCRIPTIONS

I.YEARFALL TERM (01 SEMESTER)

FZY101 PHYSIOLOGY

(2+0) ECTS:2

Introduction to Physiology, Homeostasis, Cell Physiology, Blood Physiology, Cardiovascular System, Physiology of Respiratory System, Urinary System Physiology, Digestive System Physiology, Reproductive Physiology, Action Potential, Neuronal Circuits, Neuroplasticity, Physiology of Nervous System, Somatic Senses, Motor Function and Spinal Reflexes in the Spinal Cord, Brain Stem and Basal Ganglia, Reticular Formation, Brain waves, Epilepsy, Alertness and Sleep, Limbic System, Hypothalamus, Autonomic Nervous System, Endocrine System Physiology, Sensory Physiology.

MYO103 BASIC ANATOMY

(2+0) ECTS:2

Definition of anatomy and teaching methods. Anatomy commonly used terms. Motion system, the circulatory system. Respiratory system. The digestive system. Urinary tract. Genital tract. The central nervous system. Endocrine system. Sense Organs. Peripheral formations.

ENF119ELECTROENCEPHALOGRAPHY-EEG(BSEÇ)

(2+2) ECTS: 8

Introduction to Electromyography, EEG generators and rhythmic EEG activity, EEG device, EEG electrodes and their placement, Polarity and area detection in EEG, Technical standards in clinical EEG recording, Artifacts, Normal EEG definition, Activation methods, Neonatal EEG, Abnormal EEG patterns and relationship with neurological diseases, Classification of seizures, Computerized ictal and interictal EEG analysis methods, Video EEG monitoring, Ictal EEG semiology.

MYO003 MEDICAL TERMINOLOGY

(2+0) ECTS: 2

The aim of the Course administration, pre-and suffixes, medical terminology skeletal system, respiratory system medical terms, medical terms, Cardiovascular System, Ear, Nose and Throat medical terms, Eye of medical terms, medical terms Urology, Genitourinary System medical terms, medical terms Neurology and Psychiatry, Gastro - intestinal tract medical terms, medical terms Dermatology, Haematology medical terms.

FAR103 BASIC PHARMACOLOGY**(2+0) ECTS:2**

Introduction to Pharmacology. Pharmaceutical dosage forms. Drugs absorption, distribution. Metabolism and excretion of drugs. Interactions between drugs. (Antagonism, synergism) Autonomic nervous system drugs Mechanisms of drug action. (Cholinergic drugs) Anticholinergic drugs. Autonomic nervous system drugs. (Sympathomimetic drugs) sympatholytic drugs. Drugs affecting the central nervous system. Drugs affecting the cardiovascular system. Anti-inflammatory drugs. Narcotic analgesics. Nonnarkotik analgesics.

ENF123NEUROPHYSIOLOGICAL DEVICE AND EQUIPMENT TECHNOLOGIES (2+0) ECTS:4

Basic electrical information, Load and Current, Basic electrical information, Current and Voltage, Ohm's law, Factors affecting resistance, Biopotentials (EEG, EMG), General imaging principles, General sensor types (pressure, temperature), Basic components of physiological signal trackers (sensor , amplifier), Biopotential electrodes and types, Features of Digital EEG device, Features of Digital EEG device, EEG device and its basic components and problems, EMG device and its basic components and problems, PSG device and its basic components and problems that may be encountered.

INGU101 ENGLISH I**(3+0) ECTS:3**

This course helps the students gain basic English grammar knowledge and develop their basic reading, listening, writing and speaking skills.

TURK101 TURKISH LANGUAGE I**(2+0) ECTS:3**

This course provides the students with knowledge on the status and importance of language as a social structure of anation, language-culture relations, the place of Turkish among other languages with its historical development and spread.

ATA101 ATATURK'S PRINCIPLES AND HISTORY OF TURKISH REVOLUTION I (2+0) ECTS:3

Reform movements as a reaction to decline and disintegration of the Ottoman Empire caused by political, social, cultural and socio-psychological problems that emerged as a result of the encounter of the western and Turkish cultures; political events during the transitional period from the Ottoman Empire to the national state and the foundation of the Turkish Republic following the national struggle led by Mustafa Kemal Atatürk.

RKUL101 UNIVERSITY CULTURE I (USEC)**(0+2) ECTS:1**

Each semester includes seminars, conferences, panels, workshops and speeches that will be held for 14 weeks within the framework of a program consisting of academic units, student council and student clubs at the university.

I.YEAR SPRING TERM (02 SEMESTER)**ENF102 COGNITIVE NEUROPHYSIOLOGY I (BSEC)****(2+0) ECTS: 4**

Physiological Basis of Behaviour and Introduction to Cognitive Neurophysiology, Introduction to Physiological Mechanisms of Intellectual Functions of Brain. Cerebral Asymmetry, Motor Asymmetry, Spatial Processing, Verbal Process, Attention in Cognitive Neurophysiology, Physiopathology of Lack of Visual Attention, Hemispatial Neglect, Selective Attention, Sleep.

ENF104 NEUROLOGY I**(2+0) ECTS: 4**

Disorders of consciousness and coma, Primary Headaches, Secondary Headaches, Parkinson's Disease and Movement Disorders, Epilepsy, Cerebrovascular Diseases, Spinal Cord Diseases, Neuromuscular junction, and Muscle disorders, Amnesia and Dementia diseases, Neglect syndromes. Importance of EEG and using of EEG in the treatment of neurological diseases,.

ENF120 SLEEP EEG and PSG**(2+4) ECTS:4**

Clinical features of seizures, localized and generalized epileptiform patterns, slow waves and asymmetries, EEG report writing, focal brain lesions, diffuse, toxic and metabolic encephalopathies, organic brain syndromes and dementia, coma and other alternations of mental status, drug effects, psychiatric disorders and EEG, Electrocorticography, chronic intracerebral recordings, Sleep disorders, intraoperative monitoring.

ENF118 BIOPHYSICS**(2+0) ECTS:2**

Basic Electrical Concepts and Applications in Medicine, Membrane Biophysics, Electrical Properties of Cell Membranes, Local Potentials, Action Potentials, Transducers, Filters, Amplifiers, Measuring Instruments and Oscilloscope, Biophysical Foundations of EEG, Evoked Potentials.

ENF124 NERVE AND MUSCLE ANATOMY**(2+2) ECTS:3**

It is aimed to gain basic anatomy knowledge in order to apply EMG (Electromyography) under the supervision of a specialist in the electrophysiology laboratory in related clinics. Peripheral nervous system, Autonomic nervous

system and muscle anatomy. Understanding the integrity of muscle and nerve anatomy, functionality and topography.

RPSI209 POSITIVE PSYCHOLOGY AND COMMUNICATION SKILLS (2+0) ECTS:3

Definition of positive psychology, basic concepts, theoretical foundations and practices, socio-emotional experience and behavior, examining brain-behavior systems studied in cognitive sciences, knowing yourself and others, awareness and empathy, psychosocial life skills and problem solving skills, motivation and planning, anger, aggression and violence, relationship management and healthy decision making, persistence and compromise.

INGU102 ENGLISH II (3+0) ECTS:3

The course covers daily, academic, and Professional communication skills; such as discussions, debates, and presentations that are required in their daily, academic and professional lives.

TURK102 TURKISH LANGUAGE II (2+0) ECTS:3

This course provides the students with knowledge on the status and importance of language as a social structure of anation, language-culture relations, the place of Turkish among other languages with its historical development and spread.

ATA102 ATATURK'S PRINCIPLES AND HISTORY OF TURKISH REVOLUTION II (2+0) ECTS:3

Political social, economic and cultural changes and developments caused by the restructuring of the state and society in line with the Atatürk's principles and revolutions which aimed at rising the Turkish Republic to the level of modern nations; evaluation of the internal and external political events with the aim of finding solution to current problems.

RKUL102 UNIVERSITY CULTURE II (USEC) (0+2) ECTS:1

Each semester includes seminars, conferences, panels, workshops and speeches that will be held for 14 weeks within the framework of a program consisting of academic units, student council and student clubs at the university.

II.YEAR FALL TERM (03 SEMESTER)

ENF211 COGNITIVE NEUROPHYSIOLOGY II (2+0) ECTS:5

Learning; Nonassociative Learning, Associative Learning, Neuroplasticity, Long Term Potensiyasyon (LTP), long-term depression (LTD). Memory, Short-Term Memory, Working Memory, Long Term Memory, explicit

memory, episodic memory, semantic memory, implicit memory types, amnesia and dementia. Lateralization of brain, neuronal mechanisms of speech, categorization in the brain, the frontal processes, neural systems of emotion neurophysiology of language.

ENF213 NEUROLOGY II

(2+0) ECTS:5

Episodic epilepsy and other neurological diseases. Radiculopathies, Plexopathies, Polyneuropathies, Entrapment neuropathies, peripheral nerve injury, language disorders, Behavioral Neurology, Muscle Disorders, Sleep Disorders, Demyelinating Diseases, Central Nervous System Infections, walking and posture disorders, visual disorders.

ENF219 ELECTROMYOGRAPHY-EMG

(2+8) ECTS: 12

Basic information about EMG devices and electrodes, artifacts, EMG security, motor conduction studies, sensory conduction studies, needle electromyography, late responses, neuromuscular junction physiology, radiculopathy electrophysiological, Pleksopatilerde electrophysiological findings in Plexopathies, electrophysiological examination in Polyneuropathies, electrophysiological in peripheral nerve traumas, electrophysiological findings in Spinal cord diseases, electrophysiological findings in neuromuscular junction and muscle diseases, EMG techniques, electromyographic examination of the cranial nerves, reflexology in electrophysiology laboratory, electromyography in children, EMG in movement disorders, electrophysiological studies in spasticity and other CNS diseases diseases, autonomic nervous system examinations, EMG device information, the strategies in EMG examinations, EMG report writing, Planning of Clinical electromyography studies, statistical analysis of EMG.

ILK101 FIRST AID (BSEC)

(2+0) ECTS:3

Description of first aid, the importance of the principles of the first aid kit. Bleeding. Shock and types. Injuries. CPR (Cardio-Pulmonary Resuscitation) Foreign body aspiration. Fractures, dislocations and sprains. Burns. Hot and cold exposure. Intoxications. Medical first aid cases.

SAH101 HEALTH LAW (BSEC)

(2+0) ECTS:3

To transfer the basic institutions and concepts of the Health Law, the legal compliance conditions of the interventions, the legal nature of the relations between the doctor and the patient, and the responsibility for compensation.

II. YEAR SPRING TERM (04 SEMESTER)

ENF208 SOMATOSENSORY EVOKED POTENTIALS

(2+0) ECTS:5

Motor evoked potentials, Cortical stimulation methods in Neurophysiological studies, Evoked potentials for clinical use, Event-related potentials: P300, CNV, P50, MMN, Evoked potentials and functional neuroimaging methods.

ENF222 CLINICAL ELECTRONEUROPHYSIOLOGY PRACTICES

(2+16) ECTS:13

Electroneurophysiological methods and analysis as applied in clinic. Introduction to artificial intelligence and basic concepts. Applications of artificial intelligence. Brain-computer interface (BCI), EEG-based brain-computer interface systems, P300 speller system, classification of P300 signals. Recent developments in brain-computer interface studies.

MET101 OCCUPATIONAL ETHICS

(2+0) ECTS:2

What is Deontology? Definition and introduction, the definition and principles of ethics. What is a Job? Profession with the principles, concepts of health and disease. Teamwork in health care. Health professionals in society. Universal declaration of human rights. Patients' rights, laws and regulations related to health care management. Euthanasia and ethics, organ transplantation, ethics, geriatrics and ethics.

HLK101 PUBLIC HEALTH (BSEC)

(2+0) ECTS:3

Basic concepts in public health, primary health care, health organization in Turkey, transformation projects in health, maternal and child health, family planning, business and worker health, elderly health, social and infectious diseases, the prevention of infectious diseases and Control, Health education, health development and healthy life, Community mental health, Adequate and balanced nutrition, Environmental health.

ENF999 SUMMER INTERNSHIP

(0+20 work day) ECTS:9

To have knowledge about the functioning of the electroneurophysiology laboratory, to know the EEG, EMG and PSG devices, to have knowledge about their operation and to use these devices, to meet and inform the patient who came for EEG shooting, to connect the electrodes seamlessly for EEG shooting, to shoot and end the shooting according to standards.