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| **INTERDISCIPLINARY NEUROSCIENCE DEPARTMENT MASTER’S DEGREE PROGRAM** **Courses – ECTS Credits (Disiplinlerarası Sinirbilimleri YL)** |
| FALL SEMESTER |
|  **Code** |  **Course Name** | **ECTS** | **T+P+L** | **C/E** | **Language** |
| **522603201** | [**BIOPHYSICAL APPROACH TO NEUROSCIENCE**](#DERS522601201) | **7,5** | **3+0+0** | **COMPULSORY** | **TURKISH** |
| **522603202** | [**CELLULAR AND MOLECULAR NEUROBİOLOGY**](#DERS522601202) | **7,5** | **3+0+0** | **COMPULSORY** | **TURKISH** |
| 522605204 | [DEVELOPMENT AND HISTOLOGY OF NERVOUS TİSSUE](#DERS522601204) | 5 | 2+0+0 | ELECTIVE | TURKISH |
| 522603205 | [NEUROPSYCHOPHARMACOLOGY I](#DERS522601205) | 7,5 | 3+0+0 | ELECTIVE | TURKISH |
| **522603400** | **SEMINAR** | **7,5** | **0+1+0** | **COMPULSORY** | **TURKISH** |
| **522601700** | **SPECIALIZATION FIELD COURSE** | **5** | **3+0+0** | **COMPULSORY** | **TURKISH** |
| **522601200** | **MASTER'S THESIS** | **25** | **0+1+0** | **COMPULSORY** | **TURKISH** |
| **520111103** | **RESEARCH METHODS AND PUBLISHING ETHICS\*** | **7,5** | **3+0+3** | **COMPULSORY** | **TURKISH** |
|  |  |  |  |  |
| SPRING SEMESTER |
|  **Code** |  **Course Name** | **ECTS** | **T+P+L** | **C/E** | **Language** |
| 522604201 | [NERVE PHYSIOLOGY](#DERS522602201) | 7,5 | 3+0+0 | ELECTIVE | TURKISH |
| 522604202 | [NEUROPSYCHOPHARMACOLOGY II](#DERS522602202) | 7,5 | 3+0+0 | ELECTIVE | TURKISH |
| 522606203 | [NEUROGENETIC](#DERS522602203) | 5 | 2+1+0 | ELECTIVE | TURKISH |
| 522604204 | EXPERİMENTAL GENE THERAPY AND EXPERİMENTAL TREATMENT APPROACHES İN NEURODEGENERATİVE DİSEASES | 7,5 | 3+0+0 | ELECTIVE | TURKISH |
| **522603400** | **SEMINAR** | **7,5** | **0+1+0** | **COMPULSORY** | **TURKISH** |
| **522601700** | **SPECIALIZATION FIELD COURSE** | **5** | **3+0+0** | **COMPULSORY** | **TURKISH** |
| **522601200** | **MASTER'S THESIS** | **25** | **0+1+0** | **COMPULSORY** | **TURKISH** |
| **520111103** | **RESEARCH METHODS AND PUBLISHING ETHICS\*** | **7,5** | **3+0+3** | **COMPULSORY** | **TURKISH** |
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| **COURSE CODE:** | **522603201** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:** | BIOPHYSICAL APPROACH TO NEUROSCIENCE |  |
| **INSTRUCTOR NAME** | **COURSE LANGUAGE****Turkish: X****English:**  | **Course Catagory** |
| Technical | Medical | Other(……) |
| **Doç. Dr. Seçkin TUNCER** |  |  | **X** |  |
|  |  |  |  |  |  |  |

**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
|  | **X** |  |  |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Autumn  | 3 |  0 | 0  | 3 | 8 | Mandatory |
|  |
| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |   | **50** |
| Quiz |  |  |
| Homework |   |  |
| Project |   |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |   |
| **SHORT COURSE CONTENT** | Examination of basic biophysical concepts related to the field of neuroscience. |
| **COURSE AIMS** | To teach the basic functioning mechanisms of the cells that make up the nervous system and to examine the events that occur from a biophysical perspective. |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** | Improvement of comprehension skills by gaining a biophysical perspective on general neuroscience topics. |
| **LEARNING OUTCOMES OF THE COURSE** | Knows the basics of electrical events occurring in excitable cells, understands their mechanisms and can explain them. |
| **TEXTBOOK** | Essentials of neural science and behavior: Kandel ER, Schwartz,JH, Jessell TM, Appleteon&Lange, 1995. |
| **OTHER REFERENCES** |  1- John G. Nicholls, A. Robert Martin, Paul A. Fuchs, David A. Brown, Mathew E. Diamond, David A. Weisblat: From Neuron to Brain (Fifth Edition). Sinauer Associates, Inc., Sunderland, 2012. 2- Ferit Pehlivan: Biyofizik (13.Baskı), Pelikan Kitabevi, Ankara, 2025 |
| **TOOLS AND EQUIPMENTS REQUIRED** | Note-taking tools such as notebooks, pens, and erasers. |

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|  |  **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Particle transport through the cell membrane |
| 2 |  | Ion channels |
| 3 |  | Resting membrane potential |
| 4 |  | Electrotonic potentials |
| 5 |  | Action potential |
| 6 |  | Voltage and Patch-Clamp Techniques |
| 7 |  | Signaling between nerve cells |
| 8 |  | **Mid-term examination** |
| 9 |  | Communication between nerve cells |
| 10 |  | Chemical synaptic transmission |
| 11 |  | Electrical synaptic transmission |
| 12 |  | Postsynaptic potential generation and propagation |
| 13 |  | Excitatory postsynaptic potentials (EPSP) |
| 14 |  | Excitatory postsynaptic potentials (EPSP) |
| 15 |  | Inhibitory postsynaptic potentials (IPSP) |
| 16 |  | Review |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Skills to Collect and Apply Information Regarding Health Sciences |  |  | **X** |
| LO 2 | Scientific Inquiry and Hypothesis Generation |  |  | **X** |
| LO 3 | Literature Scanning and Evaluation Skills |  | **X** |  |
| LO 4 | Ability to Design, Conduct Experiments, Analyze and Evaluate Data |  | **X** |  |
| LO 5 | Ability to Identify and Use Experimental Tools and Equipment Properly |  | **X** |  |
| LO 6 | Ability to Work in Interdisciplinary Teams |  |  | **X** |
| LO 7 | Ability to Identify, Formulate and Solve Medical Problems |  |  | **X** |
| LO 8 | Ability to Use Computers Effectively in Research and Data Analysis |  |  | **X** |
| LO 9 | Ability to Understand the Contribution of Experimental Studies to National and International Science |  |  | **X** |
| LO 10 | Effective Written and Oral Communication/Presentation Skills |  |  | **X** |
| LO 11 | Ability to Understand and Apply Professional and Ethical Responsibility | **X** |  |  |
| LO 12 | Ability to Understand and Apply the Importance of Lifelong Learning | **X** |  |  |
| LO 13 | Ability to Recognize Basic Concepts in Medical Education |  |  | **X** |
| LO 14 | Ability to Approach Ethical Problems by Focusing on Basic Concepts |  |  | **X** |

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| **Instructor Name****Sign****Doç. Dr. Seçkin TUNCER** | **Date****30.04.2025** |

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| **COURSE CODE:**  | **:** **522603202** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:** | CELLULAR AND MOLECULAR NEUROBIOLOGY |
| **INSTRUCTOR NAME** | **COURSE LANGUAGE****Turkish: X****English: ** | **Course Catagory** |
| Technical | Medical | Other(……) |
| Prof.Dr. Didem TURGUT COŞAN   |  |  | **X** |  |

**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
| **** | **X** | **** | **** |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Autumn  |  3 | 0  |  0 | 3  | 7,5 | COMPULSORY  |
|  |
| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |  | **50** |
| Quiz |  |  |
| Homework |   |  |
| Project |  |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |  |
| **SHORT COURSE CONTENT** | Biological structures and properties of nerve cells. Molecular functions of nerve cells. At the molecular level the interaction of neurons. Gap junctions of neuronal cell. Molecular pathways of neurochemical message. Molecular mechanisms of secretion to neuron sinaps of neuro-hormones and neuro-transmitters. Microtubules proteins interact with microtubules and microtubule-dependent motor proteins in neurons. The importance of the changes in the molecular level in neurons in neurodegenerative conditions. |
| **COURSE AIMS** | Nerve cell biology is an area of ​​huge advances occurred in the last decade. Neurological sciences, modern biology to understand the activities of the brain is developing into the most dynamic area of ​​the cellular and molecular biological approaches. The main purpose of neurobiology, constituted the understanding of how the behavior of nerve cells. This is possible with the understanding of the cellular and molecular characteristics of neurons. In this course will be taught the structures and mechanisms of nerve cells and students will understand how they create these mechanisms. |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** | This course is aimed to understanding of the structure and function of nerve cells, nervous system diseases and understanding of the mechanisms at the cellular level. |
| **LEARNING OUTCOMES OF THE COURSE** | Learns the biological structure and properties of nerve cells.Learns the molecular functions of nerve cells.Learns the interaction of neurons at the molecular level.Learns the changes that occur at the molecular level in neurons in neurodegenerative conditions. |
| **TEXTBOOK** | An introduction to cellular and molecular neuroscience, Bryne Roberts, 2004, Elsevier. |
| **OTHER REFERENCES** | (1) I. B. Levitan, L. K. Kaczmarek, 1997, The Neuron: Cell and Molecular Biology, Oxford University Press(2) J. R. Cooper., F. E. Bloom, R. H. Roth, 1996, The Biochemical Basis of Neuropharmacology, Oxford University Press(3) Gary Banker, 1998. Culturing Nerve Cells (Cellular and Molecular Neuroscience) (2nd edition), MIT Press(4) Dale Purves, 2000. Neuroscience (2nd Bk&cdr edition), Sinauer Assoc.(5) L. Gordon, Fain,1999. Molecular and Cellular Physiology of Neurons, Harvard University Press(6) W. Maxwell Cowan, 2000. Synapses. Johns Hopkins University Press |
| **TOOLS AND EQUIPMENTS REQUIRED** | **Source books****Related websites** |

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|  |  **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Biological structures and molecular properties of nerve cells |
| 2 |  | General functions of nerve cells at the molecular level |
| 3 |  | Molecular mechanisms of secretion to neuron sinaps of neuro-hormones and neuro-transmitters |
| 4 |  | The interaction of neurons at the molecular level |
| 5 |  | The role of protein phosphorylation in regulating neuronal cell growth and and the importance of neuronal signal transduction pathway |
| 6 |  | The importance of the mechanisms in neuronal cell of communication between cells with gap connections |
| 7 |  | Microtubules proteins interact with microtubules and microtubule-dependent motor proteins in neurons |
| 8 |  | The importance of mechanisms of neurodegeneration in cells |
| 9 |  | The importance of development of disease and changes in neurons in neurodegenerative conditions |
| 10 |  | Mechanisms of neuronal cell death  |
| 11 |  | Various cellular mechanisms and pathways in cell death |
| 12 |  | The importance in neuronal mechanism of cell death associated with free radical damage |
| 13 |  | The importance of repair and regeneration at the molecular level after injury to the nervous system |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learns the biological structures and properties of nerve cells |  |  | **x** |
| LO 2 | Learns the molecular functions of nerve cells. |  |  | **x** |
| LO 3 | Learns the interaction of neurons at the molecular level. |  |  | **x** |
| LO 4 | Learns the connections in neuronal cells. |  |  | **x** |
| LO 5 | Learns the molecular pathways of neurochemical transmission. |  | **x** |  |
| LO 6 | Learns the importance and functions of neurohormones. |  | **x** |  |
| LO 7 | Learns the molecular mechanism of the secretion of neurotransmitters in neuronal gaps. |  | **x** |  |
| LO 8 | Learns the functions of microtubules in neurons and proteins that interact with microtubules and microtubule-dependent motor proteins. |  |  | **x** |
| LO 9 | Learns the formation mechanisms and importance of neurodegeneration in cells. |  |  | **x** |
| LO 10 | Understands the changes that occur in neurons in neurodegenerative conditions and their importance in disease development. |  |  |  |
| LO 11 | Learns neuronal cell death and mechanisms. |  | **x** |  |
| LO 12 | Understands various cellular mechanisms and pathways of action in cell death. |  |  | **x** |
| LO 13 | Learns the importance of cell death associated with free radical damage in the neuronal mechanism. |  | **x** |  |
| LO 14 | Understands the importance of repair and regeneration at the molecular level after nervous system damage. |  | **x** |  |

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| **Instructor Name****Sign**Prof.Dr. Didem TURGUT COŞAN   | **Date**30.04.2025 |

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| **COURSE CODE:** | **522605204** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:** | DEVELOPMENT AND HİSTOLOGY OF NERVOUS TISSUE |  |
| **INSTRUCTOR NAME** | **COURSE LANGUAGE****Turkish: X****English:**  | **Course Catagory** |
| Technical | Medical | Other(……) |
| Dr. Öğr. Üyesi Murat SEVİMLİ |  |  | **X** |  |
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**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
|  | **X** |  |  |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Spring Autumn **X** | 2 |  0 | 0  | 2 | 5 | COMPULSORY ELECTIVE **X** |
|  |
| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |   | **50** |
| Quiz |  |  |
| Homework |   |  |
| Project |   |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |   |
| **SHORT COURSE CONTENT** | Developmental and histological futures of nervous tissue |
| **COURSE AIMS** |  Teaching of development and histology of nervous tissue |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** | To prepare to understanding of abnormal developmental and microscopic structures of nervous tissue via teaching their normal structures |
| **LEARNING OUTCOMES OF THE COURSE** | Learning the basics of developmental and histological characteristics of nervous tissue |
| **TEXTBOOK** | Embriyoloji ve doğum defektlerinin temelleri, Çeviri editörü: Sevda Müftüoğlu, 7. Baskıdan çeviri, Güneş Kitabevi, 2009.Histology A Text and Atlas, Michael H. Ross and Wojciech Pawlina, sixth edition, Wolters kluwer Lippincott Williams & Wilkins, 2011. |
| **OTHER REFERENCES** |   |
| **TOOLS AND EQUIPMENTS REQUIRED** | **Source books**Related websites |

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|  |  **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Human developmental stages (first week) |
| 2 |  | Human developmental stages (second week) |
| 3 |  | Human developmental stages (third week) |
| 4 |  | Human developmental stages (third week) |
| 5 |  | Embryonic germ layers |
| 6 |  | **Mid-term examination** |
| 7 |  | Futures and derivatives of ectoderm |
| 8 |  | Initial development stages of nervous system |
| 9 |  | Development of neural plaque and neural tube |
| 10 |  | Futures of neuroepithelium |
| 11 |  | Derivatives of neural crest |
| 12 |  | Neuron structure |
| 13 |  | Types of neurons |
| 14 |  | Neuroglial cells |
| 15 |  | General futures of nervous tissue |
| 16 |  | **Final exam** |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learning the weekly progression of human development |  |  | **X** |
| LO 2 | Learning the early development of the nervous system in detail |  |  | **X** |
| LO 3 | Learning the general properties of nervous tissue |  |  | **X** |

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| **Instructor Name****Sign**Dr. Öğr. Üyesi Murat SEVİMLİ |  **Date**30.04.2025 |

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| **COURSE CODE:** | **522603205** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:** | NEUROPSYCHOPHARMACOLOGY I |  |
| **INSTRUCTOR NAME**Prof. Dr. Fatma Sultan KILIÇ  | **COURSE LANGUAGE****Turkish: X****English: ** | **Course Catagory** |
| Technical | Medical | Other(……) |
|  |  |  | **X** |  |

**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
| **** | **X** | **** | **** |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Spring Autumn **X**  |  3 |  0 |   | 3  | 7,5 | COMPULSORY ELECTIVE **X** |
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| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |   | **50** |
| Quiz |  |  |
| Homework |   |  |
| Project |   |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |   |
| **SHORT COURSE CONTENT** | Providing information about the neuropsychiatric disorders, basic mechanisms and role of neurotransmitters.  |
| **COURSE AIMS** | Evaluating the knowledge about development of neuropsychiatric disorders with pharmacological mechanisms. Defining the features of pharmacological approach to its mechanism of occurrence.  |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** | Pharmacological approach to the knowledge about neuropsychiatric disorders, and achievement of skill acquisition in understanding and interpreting the studies on neuropsycopharmacology  |
| **LEARNING OUTCOMES OF THE COURSE** | Learns the pharmacological properties of neuropsychiatric diseases and gains the ability to understand and interpret relevant studies |
| **TEXTBOOK** | 1. KAYAALP, S O. (2012); Akılcı Tedavi Yönünden Tıbbi Farmakoloji. |
| **OTHER REFERENCES** | 1. CİNGİ, I; EROL, K. (1996); Anadolu Üniversitesi Açık Öğretim Fakültesi Sağlık Personeli Önlisans Eğitimi, Farmakoloji.2. DÖKMECİ, I. (2007); M.Y. Okulları için Farmakoloji Dersleri. Nobel Tıp Kitapevleri.3. SÜZER, O. (2005); Farmakolojinin Temelleri.. Nobel Tıp Kitapevleri.4. GOODMAN AND GİLLMAN‘S (2011). The Pharmacological basis of Therapeutics. 12th edition5. Basic and Clinical Pharmacology: Bertram G. Katzung,6. Pharmacology: H.P.Rang, M.M Dale, J.M.Ritter,7. Lippincott’sPharmacology: Richard Harvey, Pamela Champe,8.Human Pharmacology, Molecular to Clinical: Brody, Larner, Mınneman. |
| **TOOLS AND EQUIPMENTS REQUIRED** | Source booksRelated websites |

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|  |  **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Introduction to neuropsychopharmacology  |
| 2 |  | General Approach to neuropsychopharmacology  |
| 3 |  | Neuromediators, synaps and interactions |
| 4 |  | Dopaminergic system |
| 5 |  | Epinephrine and norepinephrine |
| 6 |  | Serotonine |
| 7 |  | Acetylcholine and Histamine |
| 8 |  | **Mid term exam** |
| 9 |  | GABA and glycine |
| 10 |  | Aspartate and glutamate |
| 11 |  | Opioide peptides |
| 12 |  | Substance P, other kinines and neuropeptides |
| 13 |  | Nitrergic system |
| 14 |  | Adenosinergic system |
| 15 |  | Neurosteroides |
| 16 |  | **Final exam** |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learns the general approach to neuropsychopharmacology |  |  | **X** |
| LO 2 | Learns neuromediator systems in detail |  |  | **X** |

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| **Instructor Name****Prof. Dr. Fatma Sultan KILIÇ** **Sign** | **Date****30.04.2025** |

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| **COURSE CODE:** | **522604201** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:**  | NERVE PHYSIOLOGY |  |
| **INSTRUCTOR NAME**Prof. Dr. Orhan Tansel KORKMAZ | **COURSE LANGUAGE****Turkish: X****English: ** | **Course Catagory** |
| Technical | Medical | Other(……) |
|  |  |  | **X** |  |

**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
| **** | **X** | **** | **** |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Spring **X**Autumn **** | 3  |  0 |   | 3  | 7,5  | COMPULSORY ELECTIVE ** X** |
|  |
| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |  | **50** |
| Quiz |  |  |
| Homework |   |  |
| Project |   |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |   |
| **SHORT COURSE CONTENT** | Physiology of the peripheral and central nervous systems  |
| **COURSE AIMS** |  To teach principle subjects of the peripheral and central nervous systems |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** |  To answer the questions about Membrane Potentials, Synapses, ,Reflexes, Sensations, Control of Posture and Movement, Cerebellum, Basal Ganglia, Hypotalamus, Autonomic Nerveous System  |
| **LEARNING OUTCOMES OF THE COURSE** | Learns the basic topics of physiology that is related to peripheral and central nervous system  |
| **TEXTBOOK** |  Baret K. Ganong’s Review of Medical Physiology, 23 Edition Mc Graw Hill, Lange, 2010: Hall JE. Guyton and Hall Textbook of Medical Physiology, 12th Edition; Saunders; Elsevier, 2011. |
| **OTHER REFERENCES** |   |
| **TOOLS AND EQUIPMENTS REQUIRED** | **Source books**Related websites |

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|  | **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Overview of the nerve physiology  |
| 2 |  | Membrane Potentials  |
| 3 |  | Stimulation of nerves and impulse transmission |
| 4 |  | Synaptic tranmission |
| 5 |  | Synaptic tranmission |
| 6 |  | Peripheral nerve physiology |
| 7 |  | Reflexes |
| 8 |  | Midterm Exam |
| 9 |  | The physiology of the central nervous system |
| 10 |  | Sensations  |
| 11 |  |  Reticular Formation, Sleep and Alert Behavior  |
| 12 |  | Control of motor functions  |
| 13 |  | Hypotalamus  |
| 14 |  | Limbic system  |
| 15 |  | Functions of the sympathetic and parasympathetic systems |
| 16 |  | Final exam |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learns general information about nerve physiology |  |  | **X** |
| LO 2 | Learns general information about central nervous system physiology |  |  | **X** |
| LO 3 | Learns functions of sympathetic and parasympathetic systems |  |  | **X** |
| LO 4 | Learns general information about peripheral nerve physiology |  |  | **X** |

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| **Instructor Name****Sign**Prof. Dr. Orhan Tansel KORKMAZ |  **Date**30.04.2025  |

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| **COURSE CODE:** | **522604202** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:** | NEUROPSYCHOPHARMACOLOGY II |  |
| **INSTRUCTOR NAME**Prof. Dr. Fatma Sultan KILIÇ  | **COURSE LANGUAGE****Turkish: X****English: ** | **Course Catagory** |
| Technical | Medical | Other(……) |
|  |  |  | **X** |  |

**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
| **** | **X** | **** | **** |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Spring **X**Autumn  |  3 |  0 |   | 3  | 7,5 | COMPULSORY ELECTIVE **X** |
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| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |   | **50** |
| Quiz |  |  |
| Homework |   |  |
| Project |   |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |  |
| **SHORT COURSE CONTENT** | Providing information about the neuropsychiatric disorders, substance abuse and mechanisms of action. |
| **COURSE AIMS** | Evaluating the knowledge about development of neuropsychiatric disorders with pharmacological mechanisms. Defining the features of substance abuse and pharmacological approach to its mechanism of occurrence.  |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** | Pharmacological approach to the knowledge about neuropsychiatric disorders, instructing thw pharmacological approach to the addiction, and achievement of skill acquisition in understanding and interpreting the studies on neuropsycopharmacology and substance abuse.  |
| **LEARNING OUTCOMES OF THE COURSE** | Learns the pharmacological properties of neuropsychiatric diseases and gains the ability to understand and interpret relevant studies |
| **TEXTBOOK** | 1. KAYAALP, S O. (2012); Akılcı Tedavi Yönünden Tıbbi Farmakoloji. |
| **OTHER REFERENCES** | 1. CİNGİ, I; EROL, K. (1996); Anadolu Üniversitesi Açık Öğretim Fakültesi Sağlık Personeli Önlisans Eğitimi, Farmakoloji.2. DÖKMECİ, I. (2007); M.Y. Okulları için Farmakoloji Dersleri. Nobel Tıp Kitapevleri.3. SÜZER, O. (2005); Farmakolojinin Temelleri.. Nobel Tıp Kitapevleri.4. GOODMAN AND GİLLMAN‘S (2011). The Pharmacological basis of Therapeutics. 12th edition5. Basic and Clinical Pharmacology: Bertram G. Katzung,6. Pharmacology: H.P.Rang, M.M Dale, J.M.Ritter,7. Lippincott’sPharmacology: Richard Harvey, Pamela Champe,8.Human Pharmacology, Molecular to Clinical: Brody, Larner, Mınneman |

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|  |  **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Introduction to neuropsychopharmacology 1 |
| 2 |  | Introduction to neuropsychopharmacology 2 |
| 3 |  | Pharmacologic approach and mechanisms in the development of pain |
| 4 |  | Pharmacologic approach and mechanisms in neuropathic pain |
| 5 |  | Pharmacologic approach and mechanisms in epilepsy |
| 6 |  | Pharmacologic approach and mechanisms in Parkinson’s Disease |
| 7 |  | Midterm exam |
| 8 |  | Pharmacologic approach and mechanisms in affective disorder |
| 9 |  | Pharmacologic approach and mechanisms in schizophrenia |
| 10 |  | Pharmacologic approach and mechanisms in Obsessive compulsive disorder |
| 11 |  | Pharmacologic approach to anxiety |
| 12 |  | Pharmacologic approach to the substance abuse 1 |
| 13 |  | Pharmacologic approach to the substance abuse 2 |
| 14 |  | Pharmacologic approach and mechanisms in other neuropsychiatric disorders |
| 15 |  | Final exam |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learns the general approach to neuropsychopharmacology |  |  | **X** |
| LO 2 | Learns in detail the pharmacological agents used in neuropsychiatric disease treatments |  |  | **X** |

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| **Instructor Name****Prof. Dr. Fatma Sultan KILIÇ** **Sign** | **Date****30.04.2025** |

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| **COURSE CODE:**  | **522606203** | **DEPARTMENT:** INTERDISCIPLINARY NEUROSCIENCE |
| **COURSE NAME:** NEUROGENETICS |
| **INSTRUCTOR NAME**Prof.Dr.Sevilhan ARTAN | **COURSE LANGUAGE****Turkish: X****English:**  | **Course Catagory** |
| Technical | Medical | Other(……) |
|  |  |  | **X** |  |
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**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** | **COURSE OF PROVINCE** |
|  | **X** |  |  |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** |
| Spring **X**Autumn  | 2 |  | 1 | 2,5 | 5 | COMPULSORY ELECTIVE **X** |
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| **ASSESMENT CRITERIA** |
| **MID-TERM** | **ACTIVITY** | **Quantity** | **Percentage (%)** |
| Mid-Term |  | **50** |
| Quiz |  |  |
| Homework |  |  |
| Project |   |  |
| Oral Exam |  |  |
| Other (………) |  |  |
|  | **Final Examination** | **50** |
| **PREREQUISITE(S)** |   |
| **SHORT COURSE CONTENT** | Basic molecular genetic concepts, mutations, epigenetic events, defining a phenotype, pedigree drawing and points in the evaluation of kindreds, inheritance patterns, molecular pathogenesis of neuromuscular, neurodegenerative and neuropsychiatric diseases  |
| **COURSE AIMS** | To teach basic molecular genetics concepts and drawing pedigree, importance of the evaluation of phenotypes and pedigree,inheritance patterns and molecular pathologies of neurological diseases  |
| **COURSE CONTRBUTION TO THE PROFESSIONAL EDUCATION OBJECTIVES** |  Ability to learn molecular basics of neurogenetic markers and molecular etiologies of neurological diseases  |
| **LEARNING OUTCOMES OF THE COURSE** | Learns the basic concepts of medical genetics |
| **TEXTBOOK** |  [Nicholas Wood](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_1/192-7444858-3898304?_encoding=UTF8&field-author=Nicholas%20Wood&search-alias=books&sort=relevancerank).  Neurogenetics: A Guide for Clinicians . Cambridge medicine, 2012 |
| **OTHER REFERENCES** |   [Warner](http://www.google.com.tr/search?hl=tr&tbo=p&tbm=bks&q=inauthor:%22Thomas+T.+Warner%22) T.,  [Hammans](http://www.google.com.tr/search?hl=tr&tbo=p&tbm=bks&q=inauthor:%22Simon+R.+Hammans%22) SR. Practical Guide to Neurogenetics. Elsevier Health Sciences, 2008  |
| **TOOLS AND EQUIPMENTS REQUIRED** | Source booksRelated websites |

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|  |  **COURSE SCHEDULE (Weekly)** |
| **WEEK** |  **DATE** | **TOPICS** |
| 1 |  | Basic molecular genetic concepts (DNA/RNA/gene/exon etc) |
| 2 |  | Mutations / Epigenetics |
| 4 |  | Phenotype defining |
| 5 |  | Drawing pedigre and kindred evaluation |
| 6 |  | Inheritance Patterns |
| 7 |  | Autosomal dominant neurological diseases |
| 8 |  | Autosomal recessive neurological diseases |
| 9 |  | X -linked neurological diseases |
| 10 |  | Molecular analysis techniques |
| 11 |  | Multifactorial inheritance |
| 12 |  | Mitochondrial neurological diseases |
| 13 |  | Multifactorial neurological diseases 1 |
| 14 |  | Multifactorial neurological diseases 2 |
| 15 |  | Molecular Genetics techniques – Lab application |
| 16 |  | Molecular Genetics techniques – Lab application |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learns basic molecular genetic concepts |  |  | **X** |
| LO 2 | Learns inheritance patterns |  |  | **X** |
| LO 3 | Learns molecular analysis methods |  |  | **X** |
| LO 4 | Learns genetic diseases of multifactorial origin |  |  | **X** |

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| **Instructor Name**Prof.Dr.Sevilhan ARTAN**Sign** |  **Date**30.04.2025 |

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| **COURSE CODE** | 522604204 | **DEPARTMENT** | **DEPARTMENT OF INTERDISCIPLINARY NEUROSCİENCE** |
| **COURSE NAME** | **Experimental Gene Therapy and Experimental Treatment Approaches in Neurodegenerative Diseases** |
| **INSTRUCTOR NAME** | **COURSE LANGUAGE** | **COURSE CATAGORY** |
| **Doktor Öğretim Üyesi** **Ebru ERZURUMLUOĞLU GÖKALP** | Turkish | **Technical** | **Medical** | **Other (…)** |
|  | x |  |

**COURSE LEVEL**

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| **PROPAEDEUTIC** | **M.SC.** | **Ph.D.** |
|  | X |  |

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| **SEMESTER** | **WEEKLY COURSE PERIOD** | **COURSE OF** |
| **TEORIC** | **PRACTICE** | **LABORATORY** | **CREDIT** | **ECTS** | **TYPE** |
| Spring  | 3 | 0 | 0 | 3 | 7,5 | **Elective** |
|  |
| **ASSESMENT CRITERIA** |
| **MID-TERM EXAM** | **Activity** | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | 1 | 40 |
| 2nd Mid-Term |  |  |
| Quiz |  |  |
| Homework |  |  |
| Project |  |  |
| Oral Exam |  |  |
| Other (………) |  |  |
| **FINAL EXAM** | **60** |
| **PREREQUISITE(S)** |  |
| **COURSE CONTENT** | Learning gene therapy strategies |
| **COURSE AIMS** | To learn the experimental gene therapy strategies used in the treatment of neurodegenerative diseases. |
| **COURSE OBJECTIVES** | Explain the molecular basis of gene therapy and transfer techniques. |
| **COURSE CONTRBUTION TO THE PROFESSIOAL EDUCATION OBJECTIVES** | Learns and applies experimental gene therapy strategies used in the treatment of neurodegenerative diseases. |
| **LEARNING OUTCOMES OF THE COURSE** | Learn experimental gene therapy strategies used in the treatment of neurodegenerative diseases. |
| **TEXTBOOK(S)** | Mountain, A. (2000) Gene therapy: the first decade. TIBTECH 18, 119-128. Wu, N. and Ataai, M. M. (2000) Production of viral vectors for gene therapy applications. Current opinion in biotechnology 11, 205-208. Chapter 21 pp. 616-629 |
| **REFERENCES** | Electronic search engines related to the subject and scientific books related to the field |
| **TOOLS AND EQUIPMENTS REQUIRED** | textbooks, technological equipment (computer, projector, etc.) required for the course and laboratory equipment and supplies for relevant courses. |

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| **COURSE SYLLABUS** |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | The Idea and History of Gene Therapy |
| **2** |  | Introduction to Germ Cell Gene Therapy and Somatic Cell Gene Therapy |
| **3** |  | Gene therapy vectors, Vector applications and general introduction to Viruses |
| **4** |  | Experimental Gene transfer methods -Viral Gene Transfer Systems |
| **5** |  | Adeno and Adeno-associated virus applications |
| **5** |  | **MIDTERM** |
| **6** |  | Retroviral vectors |
| **7** |  | Lentivirus vectors |
| **8** |  | Herpes Viruses |
| **9** |  | Experimental Non-viral Gene Delivery Systems I |
| **10** |  | Experimental Non-viral Gene Delivery Systems II |
| **11** |  | Introduction to Gene Therapy for neurodegenerative diseases |
| **12** |  | Introduction to Experimental RNAi-based therapeutic strategies in neurodegenerative diseases |
| **13** |  | Experimental Gene Silencing Methods in Neurodegenerative Diseases- CRISPR-Cas9 |
| **14** |  | Nörodejeneratif Hastalıklarda Deneysel Modeller I |
| **15** |  | Nörodejeneratif Hastalıklarda Deneysel Modeller II |
| **16** |  | Experimental Gene therapy and Biosafety |
| **16** |  | **FINAL EXAM** |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PROGRAM LEARNING OUTCOMES** | **CONTRIBUTION LEVEL** |
| **NO** | **LEARNING OUTCOMES (MSc)** | **1**Low | **2**MId | **3**HIgh |
| LO 1 | Learn experimental gene therapy strategies used to treat neurodegenerative diseases |  |  | **X** |

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| **INSTRUCTOR NAME** | **DATE** |
| Doktor Öğretim Üyesi Ebru ERZURUMLUOĞLU GÖKALP | 30.04.2025 |