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| **DEPARTMENT OF INTERDISCIPLINARY NEUROSCIENCE**  **Doctor of Philosophy(PhD)Programme** | | | | | |
| Code | Course Name | ECTS | T+P+L | C/E | Language |
| Fall Semester | | | | | |
| 522603301 | [RESEARCH TECHNIQUES USED IN NEUROSCIENCE FIELD I](#DERS522601301) | 7,5 | 3+1+0 | COMPULSORY | TURKISH |
| 522603302 | [FUNDAMENTALS OF NEUROSCIENCE](#DERS522601302) | 7,5 | 3+0+0 | COMPULSORY | TURKISH |
| 522603303 | [SENSORY BIOPHYSICS](#DERS522603303) | 7,5 | 3+0+0 | ELECTİVE | TURKISH |
| 522601600 | SPECIALITY FIELD COURSE | 5 | 3+0+0 | COMPULSORY | TURKISH |
|  | |  |  |  |  |
| Spring Semester | | | | | |
| 522604302 | [RESEARCH TECHNIQUES USED IN NEUROSCIENCE FIELD II](#DERS522602302) | 7,5 | 3+1+0 | COMPULSORY | TURKISH |
| 522604301 | [NEURODEGENERATIVE DISEASES AND MOLECULAR MECHANİSMS](#DERS522602301) | 7,5 | 2+2+0 | ELECTİVE | TURKISH |
| 522606303 | [DEVELOPMENTAL BRAIN EVOLUTION](#DERS522606303) | 5,0 | 2+0+0 | ELECTİVE | TURKISH |
| 522604304 | [GENETIC APPROACH TO NEUROPSYCHIATRIC DISORDERS](#DERS5226004304) | 7,5 | 3+0+0 | ELECTİVE | TURKISH |
| 522604305 | [QUANTUM PHYSICS AND CONSCIOUSNESS](#DERS522604305) | 7,5 | 2+0+0 | ELECTİVE | TURKISH |
| 522601600 | SPECIALITY FIELD COURSE | 5 | 3+0+0 | COMPULSORY | TURKISH |
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**ESOGÜ ENSTITUTE OF HEALTH SCIENCE**

**DEPARTMENT OF INTERDISIPLINARY NEUROSCIENCE**

**COURSE INFORMATION FORM**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **COURSE CODE:** | **522603301** | | **DEPARTMENT: INTERDISCIPLINARY NEUROSCIENCE** | | | |
| **COURSE NAME:** [**RESEARCH TECHNIQUES USED IN NEUROSCIENCE FIELD I**](#DERS522601301) | | | | | | |
| **INSTRUCTOR NAME**  Prof. Dr. Fatma Sultan KILIÇ,  Prof.Dr.Varol ŞAHİNTÜRK, Prof.Dr.Ferruh YÜCEL,  Prof.Dr. Emel ULUPINAR | | **COURSE LANGUAGE**  **Turkish:** X  **English: ** | | **Course Category** | | |
| Technical | Medical | Other(……) |
|  | |  | |  | X |  |

**COURSE LEVEL**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 | 1 |  | 3,5 | 7,5 | COMPULSORY ELECTIVE  X | |
|  | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | |
| **MID-TERM** | | | **ACTIVITY** | | | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | | | 1 | 25 |
| 2 nd Mid- Term | | |  |  |
| Quiz | | |  |  |
| Homework | | |  |  |
| Project | | | 1 | 25 |
| Oral Exam | | |  |  |
| Other (………) | | |  |  |
| **FINAL** | | | Quiz | | |  |  |
| Homework | | |  |  |
| Project | | |  |  |
| Oral Exam | | |  |  |
| Other(Final Exam) | | | 1 | 50 |
| **MAKE-UP EXAM** | | | Oral | | Written | Oral and Written | Multiple Choice |
| X | |  |  |  |
| **PREREQUISITE(S)** | | | -- | | | | |
| **COURSE CONTENT** | | | Introductiontobehavioraltests, electrophysiological and in vivomicroscopictechniques used inexperimentalresearchin the field ofneuroscience | | | | |
| **COURSE AIMS** | | | To providea better understandingabout current research methods and interpretation ability of the results in the literature of the neuroscience field, at the graduate student level. | | | | |
| **COURSE OBJECTIVES** | | | To comprehend and appreciate currentresearch techniquesused inthe literature, and learn their application in the limits oflaboratory facilities. | | | | |
| **TEXTBOOK(S)** | | | Guide to research techniques in neuroscience, Matt Carrer, Jennifer Shieh, Academic press, 2009. | | | | |
| **REFERENCES** | | | Cellular and molecular methods in neuroscience research, Adalberto Merighi, Giorgio Carmignoto, Springer, 2002. | | | | |

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| --- | --- |
|  | **COURSE SYLLABUS** |
| **WEEK** | **SUBJECTS/TOPICS (Theoretical)** |
| 1 | Evaluation of behavioraltestsused in experimental animals |
| 2 | Locomotor activity, motorcoordination and balancetests |
| 3 | Sensoryfunctions andpaintests |
| 4 | Spatiallearning and memory, social behavior, anxiety and depression tests |
| 5 | Stereotacticsurgical interventionsand in vivotechniques |
| 6 | Microdialysis,brainimplants andthe methodused to ensurelong-termaccess |
| 7 | Voltammetryandamperometricmeasurements |
| 8 | In vivomanipulations to the brain and neuralactivitymeasurement |
| 9 | Preparation of tissuesforelectrophysiologyexperiments(for*in vitro*and *in vivo*recordings) |
| 10 | Extracellularand intracellularrecordings |
| 11 | Patch-clamptechniques |
| 12 | Tissue preparation techniquesfor microscopic examination(fixation, blocking, cross-sections) |
| 13 | Dyes used inthe study ofthe nervous systemat the morphological and functional level. |
| 14 | Microscopic(light,fluorescencemicroscopy,electron) analysis techniques |
| 15 | Analysis methods of the microscopicimages |
| 16 | General information about thestereologicalmethods |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** |  | **1** | **2** | **3** |
| 1 | gather as well as apply knowledge of health sciences |  |  | X |
| 2 | ask scientific questions and form hypothesis |  |  | X |
| 3 | search and interpret scientific literature |  |  | X |
| 4 | design and conduct experiments as well as analyze and interpret the data |  |  | X |
| 5 | learn how to use the experimental equipment effectively |  |  | X |
| 6 | function on multi-disciplinary teams |  |  | X |
| 7 | identify, formulate, and solve medical problems |  |  | X |
| 8 | use computer effectively both in conducting the experiments and analyzing the data |  |  | X |
| 9 | understand the impact of experimental solutions on national and international sciences |  |  | X |
| 10 | use effective written and oral communication/presentation skills |  | X |  |
| 11 | get an understanding of professional and ethical responsibility |  | X |  |
| 12 | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | X |
| 13 | Ability of recognition of fundamental terms in Medical School teaching |  | X |  |
| 14 | Ability of handling ethic issues by considering fundamental terms |  | X |  |

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| **Instructor Name**  **Sign** | **Date**  12.04.2013 |



**ESOGÜ ENSTITUTE OF HEALTH SCIENCE**

**DEPARTMENT OF INTERDISIPLINARY NEUROSCIENCE**

**COURSE INFORMATION FORM**

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| --- | --- | --- | --- | --- | --- | --- |
| **COURSE CODE:** | **522603302** | | **DEPARTMENT: INTERDISCIPLINARY NEUROSCIENCE** | | | |
| **COURSE NAME: FUNDAMENTALS OF NEUROSCIENCE** | | | | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE**  **Turkish: X**  **English:** | | **Course Catagory** | | |
| Technical | Medical | Other(……) |
| Prof.Dr. Fatma Sultan KILIÇ  Prof.Dr. Emel ULUPINAR | |  | |  | **X** |  |
|  |  |  |  |  |  |  |

**COURSE LEVEL**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 | 0 | 3 | 7,5 | COMPULSORY ELECTIVE  **X** | |
|  | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | |
| **MID-TERM** | | | **ACTIVITY** | | | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | | | 1 | **25** |
| 2 nd Mid- Term | | | 1 | **25** |
| Quiz | | |  |  |
| Homework | | |  |  |
| Project | | |  |  |
| Oral Exam | | |  |  |
| Other (………) | | |  |  |
| **FINAL** | | | Quiz | | |  |  |
| Homework | | |  |  |
| Project | | |  |  |
| Oral Exam | | | **1** | **50** |
| Other(……………….) | | |  |  |
| **MAKE-UP EXAM** | | | Oral | | Written | Oral and Written | Multiple Choice |
| **X** | |  |  |  |
| **PREREQUISITE(S)** | | |  | | | | |
| **COURSE CONTENT** | | | Investigation of the basic concepts of the neuroscience by multidisciplinary approach. | | | | |
| **COURSE AIMS** | | | After investigating the structural and chemical properties of the individual components of the central nervous system, to understand the complex integration of these various components into a functional brain. | | | | |
| **COURSE OBJECTIVES** | | | Acquiring the core concepts of neuroscience field in order to understand classical textbooks and current literatures. | | | | |
| **TEXTBOOK(S)** | | | -Essentials of neural science and behavior: Kandel ER, Schwartz,JH, Jessell TM, Appleteon&Lange, 1995.  - Fundamental Neuroscience, Haines D.E.: Churchill Livingstone, 1997.  -Neuroscience: Exploring the brain: Bears M, Connors BW, PardisoMA, Lippincot&Williams&Wilkins, 2006. | | | | |
| **REFERENCES** | | | -Neuroscience Online, The Open-Access Neuroscience Electronic Textbook.  http://neuroscience.uth.tmc.edu/ | | | | |

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|  | **COURSE SYLLABUS** | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| 1 |  | Cellular and molecular concepts of neurophysiology and neuropharmacology |
| 2 |  | Resting and action potentials |
| 3 |  | Neurotransmission |
| 4 |  | Neuropeptides |
| 5 |  | **Mid-term examination-I** |
| 6 |  | Synaptic transmission in the central nervous system |
| 7 |  | Neuromodulation |
| 8 |  | Signaling between nerve cells and intracellular signaling mechanisms |
| 9 |  | Synaptic plasticity, synaps formation, survival and elimination |
| 10 |  | **Mid-term examination-II** |
| 11 |  | Interactive review of neuroanatomy |
| 12 |  | Somatosensorial systems and pathways |
| 13 |  | Special sensorial systems and parallel pathways |
| 14 |  | Motor systems |
| 15 |  | Limbic system |
| 16 |  | Higher cortical functions |
| 17 |  | **Final exam** |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** |  | **1** | **2** | **3** |
| 1 | gather as well as apply knowledge of health sciences |  |  | **X** |
| 2 | ask scientific questions and form hypothesis |  |  | **X** |
| 3 | search and interpret scientific literature |  |  | **X** |
| 4 | design and conduct experiments as well as analyze and interpret the data |  |  | **X** |
| 5 | learn how to use the experimental equipment effectively | **X** |  |  |
| 6 | function on multi-disciplinary teams |  |  | **X** |
| 7 | identify, formulate, and solve medical problems |  |  | **X** |
| 8 | use computer effectively both in conducting the experiments and analyzing the data | **X** |  |  |
| 9 | understand the impact of experimental solutions on national and international sciences |  |  | **X** |
| 10 | use effective written and oral communication/presentation skills |  | **X** |  |
| 11 | get an understanding of professional and ethical responsibility |  | **X** |  |
| 12 | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | **X** |
| 13 | Know basic medical themes |  |  | **X** |
| 14 | get a skill to place basic themes in centre of ethical problems |  |  | **X** |

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| **Instructor Name**  **Sign**  Prof.Dr.Fatma Sultan KILIÇ  Prof.Dr.Emel ULUPINAR | **Date**  13.03.2013 |



**ESOGÜ ENSTITUTE OF HEALTH SCIENCE**

**DEPARTMENT OF INTERDISIPLINARY NEUROSCIENCE**

**COURSE INFORMATION FORM**

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| --- | --- | --- | --- | --- | --- | --- |
| **COURSE CODE:** | **522603303** | | **DEPARTMENT: INTERDISIPLINARY NEUROSCIENCE** | | | |
| **COURSE NAME:** | **SENSORY BIOPHYSICS** | |  | | | |
| **INSTRUCTOR NAME**  Prof. Dr. Ferhan ESEN | | **COURSE LANGUAGE**  **Turkish: X**  **English: ** | | **Course Catagory** | | |
| Technical | Medical | Other(……) |
|  | |  | |  | X |  |

**COURSE LEVEL**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 | - | - | 3 | 7,5 | COMPULSORY ELECTIVE  **X** | |
|  | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | |
| **MID-TERM** | | | **ACTIVITY** | | | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | | |  |  |
| 2 nd Mid- Term | | | 1 | %30 |
| Quiz | | | 2 | %20 |
| Homework | | | 1 | %20 |
| Project | | |  |  |
| Oral Exam | | |  |  |
| Other (………) | | |  |  |
| **FINAL** | | | Quiz | | | 1 | %30 |
| Homework | | |  |  |
| Project | | |  |  |
| Oral Exam | | |  |  |
| Other(……………….) | | |  |  |
| **MAKE-UP EXAM** | | | Oral | | Written | Oral and Written | Multiple Choice |
|  | |  | **X** |  |
| **PREREQUISITE(S)** | | |  | | | | |
| **COURSE CONTENT** | | | The Biophysics of Sensory Perception, Receptors, Receptor Potential, The Biophysics of Visual Sensation, The Biophysics of Hearing System, Chemical Senses: Gustation and Olfaction. | | | | |
| **COURSE AIMS** | | | The aim of this course is to teach the biophysical principles of sensory perception and functioning of sensory organs in evaluation of sensory information from surrounding or within the body. | | | | |
| **COURSE OBJECTIVES** | | | The intention of the course is to familiarize the students with the biophysical principles of sensory perception in general. And to teach the functioning of sensory organs in assessing the sensory information from surrounding or within the body. | | | | |
| **TEXTBOOK(S)** | | | **Esen F, Esen H:** BİYOFİZİK Nörobiyofizik, Ankara Nobel Tıp Kitabevleri, 2016. ISBN: 978-605-9215-10-7 | | | | |
| **REFERENCES** | | | **Hoppe W., Lohmann W., Markl H., Ziegler H. (eds):** Biophysics, Springer-Verlag, Berlin, 1983. **Ruch T.C, Patton H.D**: Physiology and Biophysics (19.Edition), Saunders | | | | |

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|  | **COURSE SYLLABUS** | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| 1 |  | Coding of sensory information, Stimulus type, Stimulus intensity and duration |
| 2 |  | Localization of the stimulus, Lateral Inhibition |
| 3 |  | Optical properties of the human eye, Cornea and lens, Optical system of the eye |
| 4 |  | Visual acuity, Photoreceptors |
| 5 |  | Adaptation of photoreceptors to the ambiant light level |
| 6 |  | Center-surround antagonisms, Receptive fields of the retinal ganglion cells |
| 7 |  | Depth Perception |
| 8 |  | MID-TERM EXAM |
| 9 |  | Ses Dalgaları ile İlgili Temel Kavramlar, Şiddet ve Duyumsal Şiddet  Principal Concepts and Properties of Sound Waves, Intensity and Percieved Intensity |
| 10 |  | Outer Ear, Standing Waves and the Resonance in the Ear Canal, Functions of the Middle Ear |
| 11 |  | Inner Ear, Cohclea, Basilar Membrane, The Organ of Corti |
| 12 |  | Mechanical and Electrical Resonance in the Cochlear Hair Cell. |
| 13 |  | Sound Localization |
| 14 |  | Gustation |
| 15 |  | Olfaction |
| 16 |  | FINAL EXAM |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** |  | **1** | **2** | **3** |
| **1** | gather as well as apply knowledge of health sciences |  |  | X |
| **2** | ask scientific questions and form hypothesis |  |  | X |
| **3** | search and interpret scientific literature |  |  | X |
| **4** | design and conduct experiments as well as analyze and interpret the data |  | X |  |
| **5** | learn how to use the experimental equipment effectively | X |  |  |
| **6** | function on multi-disciplinary teams |  |  | X |
| **7** | identify, formulate, and solve medical problems |  |  | X |
| **8** | use computer effectively both in conducting the experiments and analyzing the data | X |  |  |
| **9** | understand the impact of experimental solutions on national and international sciences |  |  | X |
| **10** | use effective written and oral communication/presentation skills |  |  | X |
| **11** | get an understanding of professional and ethical responsibility |  |  | X |
| **12** | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | X |
| **13** | other (get an understanding of basic concepts of medical education) |  |  | X |
| **14** | other (get an understanding of approaching to ethical problems with taking basic concepts to center) |  | X |  |

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| **Instructor Name**  Prof. Dr. Ferhan ESEN | **Date**    11.11.2019 |

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| **COURSE CODE:** | **522604301** | | **DEPARTMENT: INTERDISCIPLINARY NEUROSCIENCE** | | | |
| **COURSE NAME:** | **NEURODEGENERATİVE DİSEASES AND MOLECULAR MECHANİSMS** | | | | | |
| **INSTRUCTOR NAME**  Prof.Dr.Oğuz ERDİNÇ,  Prof.Dr. Hülyam KURT | | **COURSE LANGUAGE**  **Turkish: X**  **English: ** | | **Course Catagory** | | |
| Technical | Medical | Other(……) |
|  | |  | |  | X | X |

**COURSE LEVEL**

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

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEMESTER** | **WEEKLY COURSE PERIOD** | | | **COURSE OF** | | | |
| **Theoric** | **Practice** | **Laboratory** | **Credit** | **ECTS** | **TYPE** | |
| Spring **X**  Autumn **** | 2 | 2 | 1 | 3 | 7,5 | COMPULSORY ELECTIVE  **X** | |
|  | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | |
| **MID-TERM** | | | **ACTIVITY** | | | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | | |  |  |
| 2 nd Mid- Term | | |  |  |
| Quiz | | |  |  |
| Homework | | | 1 | 50 |
| Project | | |  |  |
| Oral Exam | | |  |  |
| Other (………) | | |  |  |
| **FINAL** | | | Quiz | | |  |  |
| Homework | | |  |  |
| Project | | | **1** | **50** |
| Oral Exam | | |  |  |
| Other(……………….) | | |  |  |
| **MAKE-UP EXAM** | | | Oral | | Written | Oral and Written | Multiple Choice |
| **x** | |  |  |  |
| **PREREQUISITE(S)** | | |  | | | | |
| **COURSE CONTENT** | | | To introduce neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, motor neuron disease, epilepsy having different clinical features but similar neuropathological mechanisms. | | | | |
| **COURSE AIMS** | | | To introduce mechanisms of neurodegeneration and properties of neurodegenerative diseases, | | | | |
| **COURSE OBJECTIVES** | | | To understand the causes of neurodegenerative diseases at cellular and molecular level and to develop original projects on these subjects | | | | |
| **TEXTBOOK(S)** | | | Principles of Neural Science, Fifth Edition (Principles of Neural Science (Kandel) 2012; Bradley, Neurology in Clinical Practice, 2011 | | | | |
| **REFERENCES** | | | Adams Principles Of Neurology, 2011Neurodegeneration. Edited by L. Miguel Martins and Samantha H.Y. Loh, ISBN 978-953-51-0502-2, Hard cover, 362 pages, Publisher: InTech, Published: April 11, 2012, - M. Flint Beal, Anthony E. Lang, Albert C. Ludolph. Neurodegenerative Diseases: Neurobiology, Pathogenesis and Therapeutics . Cambridge University Press, Jun 2, 2005 | | | | |

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|  | **COURSE SYLLABUS** | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| 1 |  | The concept of neurodegeneration |
| 2 |  | Genetic epidemiology of neurodegenerative diseases |
| 3 |  | Neuro-degenerative mechanisms |
| 4 |  | Molecular mechanisms |
| 5 |  | Molecular mechanisms |
| 6 |  | Proteinopati |
| 7 |  | Diagnotic methods of neurodegenerative diseases |
| 8 |  | Midterm exam |
| 9 |  | Dementias and Alzheimer's disease |
| 10 |  | Amyotrofik lateral sklerosis (ALS) |
| 11 |  | Parkinson's disease |
| 12 |  | Movement disorders |
| 13 |  | Epilepsy and sleep disorders |
| 14 |  | Multiple Sclerosis |
| 15 |  | Diseases of the spinal cord |
| 16 |  | Overwiev |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** |  | **1** | **2** | **3** |
| 1 | gather as well as apply knowledge of health sciences |  |  | **x** |
| 2 | ask scientific questions and form hypothesis |  |  | **x** |
| 3 | search and interpret scientific literature |  |  | **x** |
| 4 | design and conduct experiments as well as analyze and interpret the data |  | **x** |  |
| 5 | learn how to use the experimental equipment effectively |  |  | **x** |
| 6 | function on multi-disciplinary teams |  |  | **x** |
| 7 | identify, formulate, and solve medical problems |  |  | **x** |
| 8 | use computer effectively both in conducting the experiments and analyzing the data |  |  | **x** |
| 9 | understand the impact of experimental solutions on national and international sciences |  |  | **x** |
| 10 | use effective written and oral communication/presentation skills |  |  | **x** |
| 11 | get an understanding of professional and ethical responsibility |  |  | **x** |
| 12 | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | **x** |

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| **Instructor Name**  **Sign**  Prof.Dr.Oğuz ERDİNÇ,  Prof.Dr. Hülyam KURT | **Date** |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE:** | **522604302** | **DEPARTMENT: INTERDISCIPLINARY NEUROSCIENCE** | | | |
| **COURSE NAME: RESEARCH TECHNIQUES USED IN NEUROSCIENCE FIELD II** | | | | | |
| **INSTRUCTOR NAME**  Prof. Dr. Sevilhan ARTAN,  Prof. Dr.Didem COŞAN,  Prof. Dr.Hülyam KURT,  Prof. Dr. Özkan ALATAŞ,  Prof.Dr. Gökay AKSARAY,  Prof.Dr. Çınar YENİLMEZ | | **COURSE LANGUAGE**  **Turkish:** X  **English: ** | **Course Catagory** | | |
| Technical | Medical | Other(……) |
|  | |  |  | X |  |

**COURSE LEVEL**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 | 1 |  | 3,5 | 7,5 | COMPULSORY ELECTIVEX | |
|  | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | |
| **MID-TERM** | | | **ACTIVITY** | | | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | | | 1 | 25 |
| 2 nd Mid- Term | | |  |  |
| Quiz | | |  |  |
| Homework | | |  |  |
| Project | | | 1 | 25 |
| Oral Exam | | |  |  |
| Other (………) | | |  |  |
| **FINAL** | | | Quiz | | |  |  |
| Homework | | |  |  |
| Project | | |  |  |
| Oral Exam | | |  |  |
| Other(Final Exam) | | | 1 | 50 |
| **MAKE-UP EXAM** | | | Oral | | Written | Oral and Written | Multiple Choice |
| X | |  |  |  |
| **PREREQUISITE(S)** | | | -- | | | | |
| **COURSE CONTENT** | | | Introductiontobiochemical and moleculartechniques and brainimaging techniquesused in the field ofneuroscience, diagnostic tests for neuropsychiatric diseases anddataanalysis methods. | | | | |
| **COURSE AIMS** | | | To providea better understanding about current research methods and interpretation ability of the results in the literature of the neuroscience field, at the graduate student level. | | | | |
| **COURSE OBJECTIVES** | | | To comprehend and appreciate currentresearch techniquesused inthe literature, and learn their application in the limits oflaboratory facilities. | | | | |
| **TEXTBOOK(S)** | | | Guide to research techniques in neuroscience, Matt Carrer, Jennifer Shieh, Academic press, 2009. | | | | |
| **REFERENCES** | | | Cellular and molecular methods in neuroscience research, Adalberto Merighi, Giorgio Carmignoto, Springer, 2002. | | | | |

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|  | **COURSE SYLLABUS** |
| **WEEK** | **SUBJECTS/TOPICS (Theoretical)** |
| 1 | General information aboutmoleculartechniques and their applications |
| 2 | Expressionanalysis of genesand proteins, isolation ofDNA fragments, DNAcloning and purification techniques |
| 3 | Genetherapy: physical, chemicaland viral genetransport |
| 4 | Constructionand uses oftransgenic organisms, manipulationtechniques to endogenousgenes |
| 5 | Tissue culture techniques |
| 6 | General information about thebiochemical techniques |
| 7 | Determination ofprotein expression(Western blot, ELISA, immunohistochemistry) |
| 8 | Investigation ofprotein-proteinandprotein-DNA interactions(electrophoresis, chromatography, co-immunoprecipitation) |
| 9 | Investigation ofthe post-translational modifications |
| 10 | MID-TERM EXAM |
| 11 | General information aboutbrain imagingtechniques |
| 12 | Cerebralangiography, CT, MRI, diffusionMRI, functional MRI |
| 13 | Testsused inthe diagnosis ofneurological diseases |
| 14 | Testsused inthe diagnosis ofpsychiatric diseases |
| 15 | Psychological tests and general information about their applications |
| 16 | Evaluation in the clinicalpsychology |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** |  | **1** | **2** | **3** |
| 1 | gather as well as apply knowledge of health sciences |  |  | X |
| 2 | ask scientific questions and form hypothesis |  |  | X |
| 3 | search and interpret scientific literature |  |  | X |
| 4 | design and conduct experiments as well as analyze and interpret the data |  |  | X |
| 5 | learn how to use the experimental equipment effectively |  |  | X |
| 6 | function on multi-disciplinary teams |  |  | X |
| 7 | identify, formulate, and solve medical problems |  |  | X |
| 8 | use computer effectively both in conducting the experiments and analyzing the data |  |  | X |
| 9 | understand the impact of experimental solutions on national and international sciences |  |  | X |
| 10 | use effective written and oral communication/presentation skills |  | X |  |
| 11 | get an understanding of professional and ethical responsibility |  | X |  |
| 12 | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | X |
| 13 | Ability of recognition of fundamental terms in Medical School teaching |  | X |  |
| 14 | Ability of handling ethic issues by considering fundamental terms |  | X |  |

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| **Instructor Name**  **Sign** | **12.4.2013 Date** |

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| **COURSE CODE:** **522606303** | | | **DEPARTMENT: INTERDISCIPLINARY NEUROSCIENCE** | | | |
| **COURSE NAME: DEVELOPMENTAL BRAIN EVOLUTION** | | | | | | |
| **INSTRUCTOR NAME**  **Prof.Dr. Tevfik Erhan COŞAN** | | **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 |  |  | 2 | 5,0 | COMPULSORY ELECTIVE  **X** | |
|  | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | |
| **MID-TERM** | | | **ACTIVITY** | | | **Quantity** | **Percentage (%)** |
| 1st Mid-Term | | |  |  |
| 2 nd Mid- Term | | |  |  |
| Quiz | | |  |  |
| Homework | | | 1 | 20 |
| Project | | |  |  |
| Oral Exam | | | 1 | 30 |
| Other (………) | | |  |  |
| **FINAL** | | | Quiz | | |  |  |
| Homework | | | 1 | 20 |
| Project | | |  |  |
| Oral Exam | | | 1 | 30 |
| Other(……………….) | | |  |  |
| **MAKE-UP EXAM** | | | Oral | | Written | Oral and Written | Multiple Choice |
| **1** | |  |  |  |
| **PREREQUISITE(S)** | | |  | | | | |
| **COURSE CONTENT** | | | General Basis on the Brain Evolution | | | | |
| **COURSE AIMS** | | | General understanding and follow-up of the world literature and advancements | | | | |
| **COURSE OBJECTIVES** | | | Mentality of the World investigations and reserches | | | | |
| **TEXTBOOK(S)** | | |  | | | | |
| **REFERENCES** | | |  | | | | |

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|  | **COURSE SYLLABUS** | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| 1 |  | What is evolution science? |
| 2 |  | Principle nervous system initiation |
| 3 |  | Primitive brain in living beings |
| 4 |  | Brain from primitive beings to primates |
| 5 |  | Brain in primates |
| 6 |  | Geological and biological evolutions |
| 7 |  | MIDTERM EXAM |
| 8 |  | Brain and Evolution Economy |
| 9 |  | From early hominides to homo sapienses |
| 10 |  | What is consciousness and its evolution? |
| 11 |  | The present and the future of the brain evolution |
| 12 |  | Evo-devo investigations (1) (molecular, genetic and structural perspectives) |
| 13 |  | Evo-devo investigations (2) |
| 14 |  | Consciousness and cell (1) (mirror neurons, etc.) |
| 15 |  | Consciousness and cell (2) (inracellular structures, microtubular quantum, etc) |
| 16 |  | FINAL EXAM |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** |  | **1** | **2** | **3** |
| 1 | gather as well as apply knowledge of health sciences |  |  | **X** |
| 2 | ask scientific questions and form hypothesis |  |  | **X** |
| 3 | search and interpret scientific literature |  |  | **X** |
| 4 | design and conduct experiments as well as analyze and interpret the data |  | **X** |  |
| 5 | learn how to use the experimental equipment effectively | **X** |  |  |
| 6 | function on multi-disciplinary teams |  |  | **X** |
| 7 | identify, formulate, and solve medical problems |  | **X** |  |
| 8 | use computer effectively both in conducting the experiments and analyzing the data |  |  | **X** |
| 9 | understand the impact of experimental solutions on national and international sciences |  |  | **X** |
| 10 | use effective written and oral communication/presentation skills |  | **X** |  |
| 11 | get an understanding of professional and ethical responsibility |  | **X** |  |
| 12 | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | **X** |
| 13 | other (……………………………………….) |  |  | **X** |
| 14 | other (……………………………………….) |  |  | **X** |

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| **Instructor Name**  **Signature**  **Prof.Dr. Tevfik Erhan COŞAN** | **Date**  **17.11.2016** |

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| **COURSE CODE** | **522604304** | **DEPARTMENT** | **INTERDISCIPLINARY NEUROSCIENCE**  **DEPARTMENT** | | |
| **COURSE NAME** **GENETIC APPROACH TO NEUROPSYCHIATRIC DISORDERS** | | | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Sevilhan ARTAN  Dr. Öğr. Üye. Ebru ERZURUMLUOĞLU GÖKALP | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring | 3 |  |  | | 3 | | 7,5 | | Elective |
|  | | | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | | | |
| **MID-TERM EXAM** | | | **Activity** | | | **Quantity** | | **Percentage (%)** | |
| 1st Mid-Term | | | 1 | | 50 | |
| 2nd Mid-Term | | |  | |  | |
| Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (………) | | |  | |  | |
| **FINAL EXAM** | | | Quiz | | | 1 | | 50 | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | |  | |  | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Basic molecular genetics concepts, mutation types, epigenetics, analysis methods, evaluation of molecular pathogenesis in neuropsychiatric diseases | | | | | | |
| **COURSE AIMS** | | | Basic concepts of medical genetics, evaluation of genetic and epigenetic mechanisms in neuropsychiatric diseases will be learned | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, molecular basis of neuropsychiatric diseases and genetic risk factors will be learned | | | | | | |
| **TEXTBOOK(S)** | | | Yasui, D., Peedicayil, J., & Grayson, D. R. (Eds.). (2016). Neuropsychiatric Disorders and Epigenetics. Academic Press. | | | | | | |
| **REFERENCES** | | | Geschwind, D. H., Paulson, H. L., & Klein, C. (2018). *Neurogenetics* (Vol. 148). Elsevier | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Basic molecular genetics concepts |
| **2** |  | Pedigree analysis and inheritance patterns |
| **3** |  | Number of copies variants and mutations |
| **4** |  | Epigenetic Mechanisms: DNA Methylation, Histone Modifications |
| **5** |  | Epigenetic Mechanisms: Non-coding RNAs |
| **6** |  | Methods Used in Genetic Diagnosis |
| **7** |  | New generation genetic technologies |
| **8** |  | Genetics in Major Depressive Disorder |
| **9** |  | MID-TERM EXAM |
| **10** |  | Genetics in autism spectrum disorders |
| **11** |  | Genetics of Schizophrenia |
| **12** |  | Behavioral disorder with progressive dementias and genetic factors |
| **13** |  | Data analysis in molecular cytogenetic and molecular tests |
| **14** |  | Overview and evaluation |
| **15** |  | Overview and evaluation |
| **16** |  | FINAL EXAM |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | **1** | **2** | **3** |
| **1** | gather as well as apply knowledge of health sciences |  |  | **X** |
| **2** | ask scientific questions and form hypothesis |  |  | **X** |
| **3** | search and interpret scientific literature |  |  | **X** |
| **4** | design and conduct experiments as well as analyze and interpret the data | **X** |  |  |
| **5** | learn how to use the experimental equipment effectively | **X** |  |  |
| **6** | function on multi-disciplinary teams |  |  | **X** |
| **7** | identify, formulate, and solve medical problems |  |  | **X** |
| **8** | use computer effectively both in conducting the experiments and analyzing the data |  |  |  |
| **9** | understand the impact of experimental solutions on national and international sciences |  |  |  |
| **10** | use effective written and oral communication/presentation skills |  | **X** |  |
| **11** | get an understanding of professional and ethical responsibility |  |  | **X** |
| **12** | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | **X** |
| **13** | other (get an understanding of basic concepts of medical education) |  |  | **X** |
| **14** | other (get an understanding of approaching to ethical problems with taking basic concepts to center) |  | **X** |  |

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| **INSTRUCTOR NAME** | **DATE** |
| Prof. Dr. Sevilhan ARTAN  Dr. Öğr. Üye. Ebru ERZURUMLUOĞLU GÖKALP | 05.11.2019 |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522604305** | **DEPARTMENT** | **DEPARTMENT OF INTERDİSCİPLİNARY NEUROSCİENCE** | | |
| **COURSE NAME** | | QUANTUM PHYSICS AND CONSCIOUSNESS | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. T. Erhan COŞAN | | Turkish | **Technical** | **Medical** | **Other (…)** |
|  | X |  |

**COURSE LEVEL**

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SEMESTER** | **WEEKLY COURSE PERIOD** | | | **COURSE OF** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring | 2 | 2 | 0 | 3 | | 7,5 | | **Elective** |
|  | | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | | |
| **MID-TERM EXAM** | | | **Activity** | | **Quantity** | | **Percentage (%)** | |
| 1st Mid-Term | |  | |  | |
| 2nd Mid-Term | |  | |  | |
| Quiz | | 1 | | 20 | |
| Homework | | 3 | | 30 | |
| Project | |  | |  | |
| Oral Exam | |  | |  | |
| Other (………) | |  | |  | |
| **FINAL EXAM** | | | | | | | **50** | |
| **PREREQUISITE(S)** | | |  | | | | | |
| **COURSE CONTENT** | | | Fundamentals of Quantum Physics, explanation of consciousness through quantum mechanics, | | | | | |
| **COURSE AIMS** | | | Fundamentals of Quantum Physics, Consciousness and quantum computing. | | | | | |
| **COURSE OBJECTIVES** | | | Increase knowledge about consciousness | | | | | |
| **TEXTBOOK(S)** | | | Prof. Dr. T. Erhan COŞANProf. Dr. Abdullah ALGIN“BİLİNÇ ve GERÇEKLİK” | | | | | |
| **REFERENCES** | | |  | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Hidden Knowledge in Quantum Dynamics |
| **2** |  | Kuantum Dinamiklerinin Temel Kavramları |
| **3** |  | Kuantumun Saklı Değişkenleri Bilgiye Dönüyor |
| **4** |  | Zaman |
| **5** |  | Kuantum Dinamikleri ve Biyolojik Sistemler |
| **6** |  | **MIDTERM** |
| **7** |  | Quantum Dynamics and Biological Systems |
| **8** |  | Is Artificial Intelligence Consciousness? |
| **9** |  | Will Quantum Computers Become Conscious? |
| **10** |  | Consciousness |
| **11** |  | From Neural Networks to Consciousness |
| **12** |  | Remote Control of the Brain |
| **13** |  | Consciousness of Universe |
| **14** |  | Noosphere |
| **15,16** |  | **FINAL EXAM** |

**PROGRAM QUTCOMES**

Place choose never(1), few(2) or many(3) regarding your course

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | **1** | **2** | **3** |
| **1** | gather as well as apply knowledge of health sciences |  |  | x |
| **2** | ask scientific questions and form hypothesis |  |  | x |
| **3** | search and interpret scientific literature |  |  | x |
| **4** | design and conduct experiments as well as analyze and interpret the data |  |  | x |
| **5** | learn how to use the experimental equipment effectively |  |  | x |
| **6** | function on multi-disciplinary teams |  | x |  |
| **7** | identify, formulate, and solve medical problems |  |  | x |
| **8** | use computer effectively both in conducting the experiments and analyzing the data |  |  | x |
| **9** | understand the impact of experimental solutions on national and international sciences |  |  | x |
| **10** | use effective written and oral communication/presentation skills |  |  | x |
| **11** | get an understanding of professional and ethical responsibility |  |  | x |
| **12** | get a recognition of the need for, and an ability to engage in lifelong learning |  |  | x |
| **13** | other (get an understanding of basic concepts of medical education) |  |  | x |
| **14** | other (get an understanding of approaching to ethical problems with taking basic concepts to center) |  |  | x |

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| **INSTRUCTOR NAME** | **DATE** |
| Prof. Dr. T. Erhan COŞAN | 25.11.2021 |