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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 |
| 522601600 | SPECIALITY FIELD COURSE | 5 | 3+0+0 | COMPULSORY | TURKISH |
|  |  |  |  |  |
| Spring Semester |
| 522604301 | [NEURODEGENERATIVE DISEASES AND MOLECULAR MECHANİSMS](#DERS522602301) | 7,5 | 2+2+0 | COMPULSORY | TURKISH |
| 522604302 | [RESEARCH TECHNIQUES USED IN NEUROSCIENCE FIELD II](#DERS522602302) | 7,5 | 3+1+0 | COMPULSORY | TURKISH |
| 522604303 | [DEVELOPMENTAL BRAIN EVOLUTION](#DERS522602303) | 7,5 | 2+0+0 | ELECTİVE | TURKISH |
| 522601600 | SPECIALITY FIELD COURSE | 5 | 3+0+0 | COMPULSORY | TURKISH |
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| **COURSE CODE:** | **522603301** | **DEPARTMENT: INTERDISCIPLINARY NEUROSCIENCE** |
| **COURSE NAME:** [**RESEARCH TECHNIQUES USED IN NEUROSCIENCE FIELD I**](#DERS522601301) |
| **INSTRUCTOR NAME**Prof. Dr. Kevser EROL, Prof. Dr. Fatma Sultan KILIÇ,Prof.Dr.Neşe TUNÇEL, Prof.Dr.Hamza ESEN, 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**

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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 | 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** | 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 |

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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. Neşe TUNÇELProf.Dr. Fatma Sultan KILIÇ Prof.Dr. Emel ULUPINAR |  |  | **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 | 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.Neşe TUNÇELProf.Dr.Fatma Sultan KILIÇ Prof.Dr.Emel ULUPINAR |  **Date**13.03.2013 |

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

**COURSE LEVEL**

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| **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.Demet OZBABALIK ADAPINAR, Prof.Dr.Oğuz ERDİNÇ, Assoc.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, Assoc.Prof. Dr.Didem COŞAN, Assoc.Prof. Dr.Hülyam KURT, Prof. Dr. Özkan ALATAŞ, Prof.Dr.Demet ÖZBABALIK ADAPINAR, Prof.Dr. Baki ADAPINAR, Prof.Dr. Gökay AKSARAY, Assoc.Prof.Dr. Çınar YENİLMEZ | **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 | 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** | 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: 522604303** | **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 | 7,5 | 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** |