**STEM CELL DISCIPLINARY DOCTOR**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| Course Code | Course Name | ECTS | T+P+L | C/E | Language |
| Fall Semester | | | | | |
| 522803301 | [MESENCHYMAL STEM CELLS BIOLOGY](#DERS522801301) | 7,5 | 3+2+0 | COMPULSORY | TURKISH |
| 522803302 | [GENOME REGULATION OF STEM CELLS](#DERS522801302) | 7,5 | 3+0+0 | COMPULSORY | TURKISH |
| 522803303 | [STEM CELL SENESCENCE AND IMMORTALIZATION](#DERS522801303) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803304 | [TRANSLATIONAL STEM CELL MEDICINE](#DERS522801304) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803305 | [PLURIPOTENT STEM CELLS](#DERS522801305) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803306 | [CANCER STEM CELL BIOLOGY](#DERS522801306) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803307 | [STEM CELL APPLICATIONS İN CARDIOLOGY](#DERS522801307) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803308 | [STEM CELL APPLICATIONS IN ORTHOPEDICS](#DERS522801308) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803309 | [STEM CELL IMMUNOLOGY AND DIAGNOSTIC METHODS](#DERS522801309) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803310 | [STEM CELL BIOCHEMISTRY](#DERS522801310) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803311 | [BIOSAFETY IN STEM CELLS RES.: PHAR. AND TOX. APP.](#DERS522801311) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803312 | [STEM CELL IN GROWTH AND REGENERATION](#DERS522801312) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803313 | [CELL AND TISSUE BANKING](#DERS522801313) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803314 | [INDUCED PLURIPOTENT STEM CELLS](#DERS522801314) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803315 | [EPIGENETIC AND REPROGRAMMING](#DERS522801315) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803316 | [STEM CELL APPLICATIONS IN PEDIATRIC SURGERY](#DERS522801316) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803317 | [BONE AND MUSCULOSKELETAL TISSUE ENGINEERING](#DERS522801317) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803318 | [STEM CELL NICHE](#DERS522801318) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803319 | [STEM CELL PROTEOMIC](#DERS522801319) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803320 | [NEXT GEN. SEQUENCING AND BIOINF. IN STEM CELL RES.](#DERS522801320) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522803321 | [TISSUE ENGINEERING IN PEDIATRIC SURGERY](#DERS522801321) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803322 | [STEM CELL APPLICATIONS IN CARDIOVASCULAR SURGERY](#DERS522801322) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803323 | [STEM CELL APP. IN EAR, NOSE AND THROAT DISEASES](#DERS522801323) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522803324 | [STEM CELL APPLICATIONS IN UROLOGICAL DISEASES](#DERS522801324) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522801600 | [SPECIALIZATION FIELD COURSE](file:///C:\Users\PC\Downloads\Information%20Package%20and%20Course%20Catalogue.doc#DERS522701700) | 5 | 3+0+0 | COMPULSORY | TURKISH |
|  | |  |  |  |  |
| Sipring Semester | | | | | |
| 522804301 | [STEM CELL DIFFERENTIATION](#DERS522802301) | 7,5 | 3+2+0 | COMPULSORY | TURKISH |
| 522804302 | [STEM CELL LINES IN GMP](#DERS522802302) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522804303 | [STEM CELL APPLICATIONS IN GENERAL SURGERY](#DERS522802303) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804304 | [APPLICATIONS OF CELL THERAPY IN PLASTIC SURGERY](#DERS522802304) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804305 | [STEM CELL AND DIABETES](#DERS522802305) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804306 | [CLINICAL TISSUE ENGINEERING](#DERS522802306) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804307 | [NEURAL STEM CELL](#DERS522802307) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804308 | [CURRENT ASPECTS OF TISSUE ENGINEERING](#DERS522802308) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804309 | [HUMAN REGENERATION](#DERS522802309) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522804310 | [STEM CELL APPLICATIONS IN NEUROSURGERY](#DERS522802310) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804311 | [STEM CELL APPLICATIONS IN PEDIATRIC NEUROLOGY](#DERS522802311) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804312 | [STEM CELLS IN DISEASE AND PHYSIOLOGY](#DERS522802312) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522804313 | [GENE TRANSFER TECHNOLOGIES IN STEM CELLS](#DERS522802313) | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522804314 | INDUCED PLURIPOTENT STEM CELLS | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522804315 | PRINCIPLES OF STEM CELL CULTURE SYSTEM | 7,5 | 3+2+0 | ELECTIVE | TURKISH |
| 522804316 | [PRINCIP. OF MECHANOTRANSDUCTION AND MECHANOBIOLOGY](#DERS522804316) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804317 | [CELL. AND MOLE. MECHANISMS OF AUTOIMMUNE DISEASES](#DERS522804317) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522804318 | [CURRENT APPROACHES IN GENE AND STEM CELL THERAPY](#DERS522804318) | 7,5 | 2+0+0 | ELECTIVE | TURKISH |
| 522801600 | [SPECIALIZATION FIELD COURSE](file:///C:\Users\PC\Downloads\Information%20Package%20and%20Course%20Catalogue.doc#DERS522701700) | 5 | 2+0+0 | COMPULSORY | TURKISH |
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| **COURSE CODE** | **522803301** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **MESENCHYMAL STEM CELLS BIOLOGY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **Technical** | **Medical** | **Other (…)** |
|  | X |  |

**COURSE LEVEL**

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

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SEMESTER** | **WEEKLY COURSE PERIOD** | | | | **COURSE OF** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn (1.mt) | 3 | 2 |  | | 4 | | 7,5 | | Compulsory |
|  | | | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | | | |
| **MID-TERM EXAM** | | | **Activity** | | | **Quantity** | | **Percentage (%)** | |
| 1st Mid-Term | | | 1 | | 40 | |
| 2nd Mid-Term | | |  | |  | |
| Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (………) | | |  | |  | |
| **FINAL EXAM** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Mesenchymal stem cell concept, immunogenetic and immunphenotypic features, interaction mechanisms | | | | | | |
| **COURSE AIMS** | | | Understanding of mesenchymal stem cell concept and its biological properties | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, mesenchymal stem cells and their properties will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Adult mesenchymal stem cells Ernestina Schipani and Henry M Kronenberg. Mesenchymal Stem Cell Assays and Applications  Editors: Vemuri, Mohan C, Chase, Lucas G., Lipnick, Scott (Eds.)2011 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| --- | --- | --- |
| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | The history of mesenchymal stem cells |
| **2** |  | mesenchymal stem cell sources |
| **3** |  | mesenchymal stem cell isolation methods |
| **4** |  | immunophenotypic characteristics of mesenchymal stem cells |
| **5** |  | immunogenetic characteristics of mesenchymal stem cells |
| **6** |  | multiple differentiation studies of mesenchymal stem cells (adipogenic, osteogenic, chondrogenic, myogenic and neurogenic) |
| **7** |  | immunosupressive effect of mesenchymal stem cells |
| **8** |  | MID-TERM EXAM |
| **9** |  | anti-apoptotic effect of mesenchymal stem cells |
| **10** |  | anti-fibrotic effect of mesenchymal stem cells |
| **11** |  | anti-inflammatory effects of mesenchymal stem cells |
| **12** |  | mesenchymal stem cells and induction of vascularization |
| **13** |  | plasticity of mesenchymal stem cells |
| **14** |  | mesenchymal stem cells used in research models |
| **15** |  | clinical applications of mesenchymal stem cells, mesenchymal stem cells and tissue engineering |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803302** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **GENOME REGULATİON OF STEM CELLS** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn (3.mt) | 3 | 2 |  | | 4 | | 7,5 | | Compulsory |
|  | | | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | | | |
| **MID-TERM EXAM** | | | **Activity** | | | **Quantity** | | **Percentage (%)** | |
| 1st Mid-Term | | | 1 | | 40 | |
| 2nd Mid-Term | | |  | |  | |
| Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (………) | | |  | |  | |
| **FINAL EXAM** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Genomic regulation and control of gene expression, genomic regulation in stem cell differentiation and cellular identity | | | | | | |
| **COURSE AIMS** | | | Learning of genomic regulation and control of gene expression, genomic regulation in stem cell differentiation and cellular identity | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, genomic regulation and control of gene expression, genomic regulation in stem cell differentiation and cellular identity will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Tam, W.-L. and Lim, B., Genome-wide transcription factor localization and function in stem cells (September 15, 2008), StemBook, ed. The Stem Cell Research Community, StemBook, doi/10.3824/stembook.1.19.1. Stem Cells & Regenerative Medicine Ed Kursad Turksen 2011. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Genomic regulation of stemness in stem cells |
| **2** |  | cellular molecular events of stem cells differentiation |
| **3** |  | Developmental potency of stem cells |
| **4** |  | Programming and function of specialized cell types |
| **5** |  | Control of labile differentiated states |
| **6** |  | Control of stable differentiated states |
| **7** |  | Regulated stages of gene expression (Chromatin domains, Transcription) |
| **8** |  | MID-TERM EXAM |
| **9** |  | Post-transcriptional modification, RNA transport |
| **10** |  | Translation, mRNA degradation |
| **11** |  | Modification of DNA (Structural and Chemical) |
| **12** |  | Regulation of transcription in stem cell |
| **13** |  | Regulation of transcription in cancer |
| **14** |  | Regulation of translation (RNA splicing and disease) |
| **15** |  | Cell cycle control/cancer |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803303** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL SENESCENCE AND IMMORTALIZATION** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Onur UYSAL | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Cell aging and molecular mechanisms, immortalization, production of immortal cell lines | | | | | | |
| **COURSE AIMS** | | | Understanding of cell aging, immortalization concept and mechanisms | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course cell aging, immortalization concept and mechanisms will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Cellular Senescence and the Cell Cycle J. Carl Barrett, Cynthia A. Afshari Chapter The Cell Cycle Part of the series GWUMC Department of Biochemistry Annual Spring Symposia pp 79-89 1994  Cell Immortalization Editors: Professor Dr. Alvaro Macieira-Coelho ISBN: 978-3-642-08491-1 (Print) 978-3-662-06227-2 (Online)Progress in Molecular and Subcellular Biology Volume 24 2000 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Stem Cell senescence |
| **2** |  | molecular mechanisms of cell senescence |
| **3** |  | Senescence and STASIS |
| **4** |  | Replicative senescence |
| **5** |  | Senescence genes and pathways |
| **6** |  | Mechanisms by which cells escape senescence |
| **7** |  | Common senescence/immortalization pathways |
| **8** |  | MID-TERM EXAM |
| **9** |  | Genomic approaches to identify senescence/immortalization genes and pathways |
| **10** |  | telomere biology of stromal and stem cells and its regulation |
| **11** |  | stages of cell senescence process independent of telomeres |
| **12** |  | The telomere and telomerase connection to aging and cancer |
| **13** |  | cell cycle and effects of stress on cells |
| **14** |  | immortalization |
| **15** |  | production of immortal cell lines |
| **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** |
| Yrd. Doç. Dr. Onur UYSAL |  |

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| **COURSE CODE** | **522803304** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **TRANSLATIONAL STEM CELL MEDICINE** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Immunomodulation, autologous versus allogeneic mesenchymal stem cells and clinical translation of mesenchymal stem cells therapies | | | | | | |
| **COURSE AIMS** | | | To learn the researches about immunomodulation, autologous and allogenic mesenchymal stem cells and clinical translocation of mesenchymal stem cell therapies | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of the this course, the students will learn about immunomodulation, autologous and allogeneic mesenchymal stem cells, and clinical translation of mesenchymal stem cell therapies. | | | | | | |
| **TEXTBOOK(S)** | | | Translational Stem Cell Research: Issues Beyond the Debate on the Moral Status of the Human Embryo (Stem Cell Biology and Regenerative Medicine) 2011th Editionby Kristina Hug (Editor), Göran Hermerén (Editor). Translational Regenerative Medicine Edited by:Anthony Atala and Julie Allickson ISBN: 978-0-12-410396-2 2015. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

|  |  |  |
| --- | --- | --- |
| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Immunomodulation |
| **2** |  | autologous versus allogeneic mesenchymal stem cells |
| **3** |  | therapeutic mechanisms of mesenchymal stem cells |
| **4** |  | production of trophic factors |
| **5** |  | differentiation potential and tissue engineering |
| **6** |  | distribution of mesenchymal stem cells after systemic infusion |
| **7** |  | migration to sites of injury and homing potential of mesenchymal stem cells after systemic infusion |
| **8** |  | MID-TERM EXAM |
| **9** |  | homing strategies to enhance efficacy and safety of mesenchymal stem cells therapy |
| **10** |  | clinical translation of mesenchymal stem cells therapies |
| **11** |  | preclinical studies with mesenchymal stem cells |
| **12** |  | efficacy, safety and regulatory status of mesenchymal stem cells |
| **13** |  | the safety issues: preclinical assessment (manufacturing consistency, genetic stability, dosing and pharmacokinetics, biodistribution, immunogenicity and immunotoxicity, tumorigenicity) |
| **14** |  | the safety issues: clinical assessment (current assays for stem cell therapy safety assessment, regulation of stem cell therapeutics) |
| **15** |  | the safety issues: clinical assessment (regulatory safety requirements for stem cell therapeutics) |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803305** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **PLURIPOTENT STEM CELLS** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | The pluripotency mechanisms in embryonic stem cells | | | | | | |
| **COURSE AIMS** | | | Learning the pluripotency and the role of molecular mechanisms in embryonic stem cells. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, pluripotency and role-playing molecular mechanisms in embryonic stem cells will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Pluripotent Stem Cell Biology - Advances in Mechanisms, Methods and Models.Edited by Craig S. Atwood and Sivan Vadakkadath Meethal, ISBN 978-953-51-1590-8  Embryonic Stem Cells - Differentiation and Pluripotent Alternatives.Edited by Michael S. Kallos, ISBN 978-953-307-632-4 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Zygote, blastomer and purple potency |
| **2** |  | Blastocyst and stem cell pluripotency |
| **3** |  | Pluripotent stem cell types (embryonic stem cell, embryonic carcinoma cell, embryonic germ cell) |
| **4** |  | Origin of Pluripotent cells |
| **5** |  | Pluripotensin criteria (immortality, non-differentiation, clonability, broad developmental potential) |
| **6** |  | Properties of embryonic stem cells |
| **7** |  | Pluripotensis in vitro and in vivo |
| **8** |  | MID-TERM EXAM |
| **9** |  | Pluripotency factors; Preservation of pluripotency (transcription factors and signal molecules) |
| **10** |  | The potential for in vitro differentiation of embryonic stem cells (cell cycle changes) |
| **11** |  | The importance of embryonic stem cells in repairing DNA damage |
| **12** |  | Clinical use of embryonic stem cells |
| **13** |  | Embryonic stem cell therapy applications in genetic diseases |
| **14** |  | Regenerative medicine |
| **15** |  | Future applications |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **7,306** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **CANCER STEM CELL BIOLOGY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Selda DELİORMAN KABADERE | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Cancer stem cell and molecular mechanism. | | | | | | |
| **COURSE AIMS** | | | Cancer, cancer stem cell hypothesis, learning the molecular mechanisms involved in cancer. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, cancer, cancer stem cell hypothesis, molecular mechanisms that play a role in cancer formation will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Advances in Cancer Stem Cell Biology. Editors: Roberto Scatena, Alvaro Mordente, Bruno Giardina.ISBN: 978-1-4614-0808-6 (Print) 978-1-4614-0809-3. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Stem cell and cancer; Cancer stem cell hypothesis |
| **2** |  | Tumor stem cells and malignant cells |
| **3** |  | Stem cell microenvironment (mesenchymal stem cells in tumor stroma) |
| **4** |  | Characterization of cancer stem cells |
| **5** |  | Cancer stem cell pathways (Hedgehog / GLI, Notch signaling pathways) |
| **6** |  | TGF-β and Wnt: proliferation factors and epigenetic modulation in normal and malignant stem cells |
| **7** |  | Role of PTEN in cancer with hematopoietic and intestinal stem cells |
| **8** |  | MID-TERM EXAM |
| **9** |  | Transcription factors in hematopoietic cancer stem cells |
| **10** |  | Stem cell chromatin pattern and DNA hypermethylation |
| **11** |  | Plasticity in multipotent tumor stem cells |
| **12** |  | Tumor cells in the sleep and metastasis |
| **13** |  | Tumor angiogenesis and neurogenesis |
| **14** |  | Role of microRNAs in stem cells and cancer stem cells |
| **15** |  | Cancer stem cell destruction strategies, repair mechanisms in stem cells and transformation to cancer stem cells |
| **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. Selda DELİORMAN KABADERE |  |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522801307** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS İN CARDIOLOGY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Alparslan BİRDANE | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cells from different sources in the treatment of cardiovascular disease and guiding principle for adopting new therapies | | | | | | |
| **COURSE AIMS** | | | To learn about new researches in the field of stem cell therapies in the treatment of cardiovascular diseases | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the students will learn about new researches in the field of stem cell therapies in the treatment of cardiovascular diseases. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell and Gene Therapy for Cardiovascular Disease Edited by:Emerson C. Perin, Leslie W. Miller, Doris A. Taylor and James T. Willerson ISBN: 978-0-12-801888-0 2015. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Guiding principle for adopting new therapies (patient safety is paramount and balance of risk) |
| **2** |  | important factors of stem cell delivery to the patient (type and nature of the injury, the timing of the therapy) |
| **3** |  | important factors of stem cell delivery to the patient (the ability of the cells to engraft to the host myocardium) |
| **4** |  | stem cells from different sources in the treatment of cardiovascular disease (human embryonic stem cells) |
| **5** |  | stem cells from different sources in the treatment of cardiovascular disease (resident cardiac stem cells) |
| **6** |  | stem cells from different sources in the treatment of cardiovascular disease (skeletal myoblasts) |
| **7** |  | stem cells from different sources in the treatment of cardiovascular disease (human adult bone marrow–derived stem cells) |
| **8** |  | MID-TERM EXAM |
| **9** |  | stem cells from different sources in the treatment of cardiovascular disease (mesenchymal stem cells) |
| **10** |  | stem cells from different sources in the treatment of cardiovascular disease (endothelial progenitor cells) |
| **11** |  | stem cells from different sources in the treatment of cardiovascular disease (endogenous cardiac stem cells) |
| **12** |  | stem cells from different sources in the treatment of cardiovascular disease (umbilical cord blood stem cells) |
| **13** |  | stem cells from different sources in the treatment of cardiovascular disease (induced pluripotent stem cells) |
| **14** |  | the role of paracrine factors secreted by the stem cells in the improvement of cardiac function |
| **15** |  | stem cell–based therapies for people suffering an acute MI |
| **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. Alparslan BİRDANE |  |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803308** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN ORTHOPEDICS** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ulukan İNAN | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell therapies in bone and articular diseases and traumas. | | | | | | |
| **COURSE AIMS** | | | To learn new research about stem cell therapies and activity in orthopedic diseases and traumas | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, new researches on stem cell therapies and activity in orthopedic diseases and traumas will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cells and Bone Tissue Rajkumar Rajendram, Victor R. Preedy, Vinood Patel January 23, 2013 by CRC Press Reference - 422 Pages - 17 Color & 70 B/W Illustrations ISBN 9781466578418 - CAT# K16834 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | The burden of musculoskeletal diseases and osteoarthritis |
| **2** |  | cartilage degeneration in osteoarthritis |
| **3** |  | articular cartilage and chondrocytes, cartilage regeneration and repair |
| **4** |  | stem cell application techniques in orthopedics (tendon repair, cartilage, bone) |
| **5** |  | animal data (cartilage repair, meniscus repair) |
| **6** |  | animal data (tendon repair) |
| **7** |  | animal data (intervertebral disc) |
| **8** |  | MID-TERM EXAM |
| **9** |  | clinical studies in orthopedic diseases |
| **10** |  | cell-based therapies for the treatment of chondral lesions |
| **11** |  | autologous chondrocytes implantation |
| **12** |  | mesenchymal stem cells implantation |
| **13** |  | biological scaffolds and its use in the treatment of chondral lesions |
| **14** |  | recent biomedical advances in articular cartilage repair |
| **15** |  | the ‘one step’ cell free cartilage reparative method |
| **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** |
| Doç. Dr. Ulukan İNAN |  |

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| **COURSE CODE** | **522803309** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME: STEM CELL IMMUNOLOGY AND DIAGNOSTIC METHODS** | | | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Nilgün KAŞİFOĞLU | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Effect of mesenchymal stem cells on immune cells, mesenchymal stem cell suppression of innate immunity, immunomodulatory effect of mesenchymal stem cells in adaptive immunity, diagnostic methods | | | | | | |
| **COURSE AIMS** | | | To learn about effect of mesenchymal stem cells on immune cells, mesenchymal stem cell suppression of innate immunity, immunomodulatory effect of mesenchymal stem cells in adaptive immunity, diagnostic methods | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, about effect of mesenchymal stem cells on immune cells, mesenchymal stem cell suppression of innate immunity, immunomodulatory effect of mesenchymal stem cells in adaptive immunity, diagnostic methods will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem cell immunology Catherine J. Wu 2013 by the Massachusetts General Hospital. Mesenchymal Stem Cells: Immunology and Therapeutic Benefits Najib El Haddad Stem Cells in Clinic and Research", Ali Gholamrezanezhad, ISBN 978-953-307-797-0, 2011 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE CODE** | **522803310** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL BIOCHEMISTRY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Sema USLU | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn (1.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | regulatory mechanisms of stem cell proliferation, differentiation, motility and polarity, signal transduction and cell signaling in stem cell, metabolisms of stem cell | | | | | | |
| **COURSE AIMS** | | | To examine biochemical aspects of regulatory, signaling and metabolism of stem cells | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the regulatory mechanisms, signaling mechanisms and metabolism of stem cells will be learned biochemically. | | | | | | |
| **TEXTBOOK(S)** | | | Biochemistry and Molecular Biology 4th Edition by William H. Elliott (Author), Daphne C. Elliott (Author) 2009. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Cell cycle, cell cycle regulation of stem cells |
| **2** |  | Stem cell aging, cell death |
| **3** |  | regulatory mechanisms of stem cell proliferation, differentiation, motility and polarity |
| **4** |  | cell membrane and receptor biochemistry |
| **5** |  | protein structure and function |
| **6** |  | cell membrane structure and function |
| **7** |  | signal transduction and cell signaling in stem cell |
| **8** |  | MID-TERM EXAM |
| **9** |  | growth factors or inhibitors in stem cell differentiation |
| **10** |  | İmportance of extracellular matrix and integrins in stem cell applications |
| **11** |  | metabolisms of stem cell |
| **12** |  | intermolecular interaction between proteins, lipids and carbohydrate chain in modulation of intra/extracellular information |
| **13** |  | biochemical processes in genome replication and repair |
| **14** |  | Biochemical approach to stem cell research |
| **15** |  | Future applications |
| **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. Sema USLU |  |

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| **COURSE CODE** | **522803311** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME: BIOSAFETY IN STEM CELLS RESEARCHS: PHARMACOLOGICAL AND TOXICOLOGICAL APPROACH** | | | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Engin YILDIRIM | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(1.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Biosafety in stem cell research | | | | | | |
| **COURSE AIMS** | | | To learn pharmacological and toxicological aspects of biosafety studies in stem cell research | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, biosafety studies in stem cell research will be learned in terms of pharmacology and toxicology. | | | | | | |
| **TEXTBOOK(S)** | | | Biosafety Resource Book. Andrea Sonnino Food and Agriculture Organization of the United Nations Rome, 2011. Bioethics and Biosafety M. K. Sateesh I. K. International Pvt Ltd, 25 Ağu 2008 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | 1) General preclinical study design |
| **2** |  | 2) Preclinical biosafety animal studies a) Screening tests |
| **3** |  | b) Drug toxicity studies |
| **4** |  | Acute toxicity |
| **5** |  | Subacute toxicity |
| **6** |  | Chronic toxicity |
| **7** |  | Specific toxicity studies (teratogenic, carcinogenic, mutagenic, effects on fertility) |
| **8** |  | MID-TERM EXAM |
| **9** |  | c) Pharmacokinetic and pharmacodynamic studies in animals |
| **10** |  | d) Chemical and pharmaceutical development |
| **11** |  | 3) Clinical evaluation |
| **12** |  | a) First period (Phase I) attempts (pharmacokinetic studies, bioavailability, drug safety |
| **13** |  | b) Second period (Phase II) attempts (optimal dose, the therapeutic dose range,the degree of therapeutic effect, side effect profile) |
| **14** |  | c) Third period (Phase III) attempts (bioequivalence, comparison of placebo and genetic drug) |
| **15** |  | d) Fourth period (Phase IV) attempts(post marceting studies) |
| **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** |
| Doç. Dr. Engin YILDIRIM |  |

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| **COURSE CODE** | **522803312** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL IN GROWTH AND REGENERATION** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | 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** |
| Autumn(3.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell biology and molecular mechanisms in the development and renewal of mammalian organ | | | | | | |
| **COURSE AIMS** | | | To learn stem cell biology and molecular mechanisms in the development and renewal of mammalian organ | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, stem cell biology and molecular mechanisms in the development and renewal mammalian organ will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cells and Tissue Engineering Mirjana Pavlovic, Bela Balint Springer-Verlag New York 2013. Stem Cells: From Mechanisms to Technologies Michal K. Stachowiak World Scientific, 2012 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | The role of stem cell in mammal organ growth and regeneration |
| **2** |  | pluripotency concept and pluripotent stem cell |
| **3** |  | pluripotent stem cell self-renewal |
| **4** |  | regulation of pluripotent stem cell self-renewal |
| **5** |  | asymmetric cell division and stem cells |
| **6** |  | cell extrinsic regulation of stem cell self-renewal |
| **7** |  | stem cell differentiation mechanisms |
| **8** |  | MID-TERM EXAM |
| **9** |  | molecular mechanisms of the development and the regeneration of organs |
| **10** |  | protective and directional effects of stem cells in regeneration and differentiation mechanisms |
| **11** |  | overgrowth pathways |
| **12** |  | overgrowth pathways disorders |
| **13** |  | the role of stem cells in cancer development |
| **14** |  | stem cell self-renewal |
| **15** |  | the role of tumor suppressors in stem cell self-renewal and aging |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

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| **COURSE CODE** | **522803313** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **CELL AND TISSUE BANKING** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Onur UYSAL | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | The aim of cell and tissue banking, using areas, freezing storage of cells and tissues and standards | | | | | | |
| **COURSE AIMS** | | | To learn the purpose of cell and tissue banking, using areas, storage of cells and tissues by freezing and standards | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the purpose of cell and tissue banking, using areas, storage by freezing of cells and tissues, and standardization will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Essentials of Tissue Banking Editors: Galea, George (Ed.) 2010 Springer ISBN 978-90-481-9142-0. Regulatory Issues in the Therapeutic Use of Stem Cells in Regenerative Medicine and Tissue Engineering", book edited by Jose A. Andrades, ISBN 978-953-51-1108-5, Published: May 22, 2013 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Aim of cell and tissue banking |
| **2** |  | guidance documents |
| **3** |  | human biological specimens: banked tissues include: bone, corneas, heart valves |
| **4** |  | human biological specimens: tendons, skin |
| **5** |  | human biological specimens: haematopoetic tissues, bone marrow and cord blood |
| **6** |  | human biological specimens: dura mater |
| **7** |  | human biological specimens: ear ossicles, and cartilage |
| **8** |  | MID-TERM EXAM |
| **9** |  | non-banked (stored) human biological specimens |
| **10** |  | common clinical uses for banked tissue |
| **11** |  | standards: process required for safe tissue transplantation |
| **12** |  | requirements for donor selection and various testing methods used to detect viruses |
| **13** |  | procedures: collection procedures of bone, skin, heart valve |
| **14** |  | infection control |
| **15** |  | cryopreservation of cell and tissue |
| **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** |
| Yrd. Doç. Dr. Onur UYSAL |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803314** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **INDUCED PLURIPOTENT STEM CELLS** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 3 | 2 |  | | 4 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Induced pluripotent stem cells (IPSc), reprogramming and therapeutic potential | | | | | | |
| **COURSE AIMS** | | | Learning induced pluripotent stem cells (IPSc), reprogramming and therapeutic potential | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, induced pluripotent stem cells (IPSc), reprogramming and therapeutic potential will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Induced Pluripotent Stem (iPS) Cells: Methods and Protocols. Editors: Turksen, Kursad, Nagy, Andras (Eds.) 2016 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Production, culture and characterization of pluripotent stem cells |
| **2** |  | re-programming factors |
| **3** |  | History of cellular reprogramming |
| **4** |  | Nuclear transfer and the cloning of animals |
| **5** |  | Reprogramming factors and alternative pluripotent states |
| **6** |  | Induced Pluripotent Stem Cells |
| **7** |  | Are iPSCs Truly Equivalent to ESCs? |
| **8** |  | MID-TERM EXAM |
| **9** |  | Mouse IPSc |
| **10** |  | human IPSc |
| **11** |  | Myc family genes, Nanog function in pluripotency |
| **12** |  | Oct-3/4 and Sox-2 function in pluripotency |
| **13** |  | Therapeutic potential of iPSCs |
| **14** |  | iPSCs and cell therapy |
| **15** |  | Current Challenges in iPSC Research |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803315** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **EPIGENETIC AND REPROGRAMMING** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Nilüfer ERKASAP | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Epigenetic concept and its importance in stem cell differentiation | | | | | | |
| **COURSE AIMS** | | | To learn epigenetic concept, the importance of stem cell differentiation, reprogramming and the mechanisms of pluripotency. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the epigenetic concept, the importance of stem cell differentiation, reprogramming and the mechanisms of pluripotency will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Epigenetic Mechanisms in Cellular Reprogramming Eds: Alexander Meissner, Jörn Walter ISBN: 978-3-642-31973-0 in Epigenetics and Human Health 2015. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Pluripotent stem cells and epigenetic |
| **2** |  | the factors that control gene expression |
| **3** |  | the factors that control gene expression molecular structures |
| **4** |  | the factors that control gene expression molecular structures they formed and their functions |
| **5** |  | epigenetic concept |
| **6** |  | the importance of epigenetic concept in stem cell differentiation |
| **7** |  | epigenetic reprogramming |
| **8** |  | MID-TERM EXAM |
| **9** |  | Mechanisms of epigenetic reprogramming |
| **10** |  | Mechanisms of epigenetic reprogramming and pluripotency |
| **11** |  | Intermediate stages of reprogramming |
| **12** |  | Possible mechanisms leading to DNA demethylation |
| **13** |  | progenitor cells and re-editing of epigenetic information |
| **14** |  | epigenetics in reprogramming of differentiated somatic cells and induced pluripotent stem cells |
| **15** |  | Therapeutic Potential of Stem Cell Metabolic Reprogramming |
| **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. Nilüfer ERKASAP |  |

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| **COURSE CODE** | **522803316** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN PEDIATRIC SURGERY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Hüseyin İLHAN | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell applications in pediatric surgery | | | | | | |
| **COURSE AIMS** | | | Learning that the usage potentials and recent developments of mesenchymal stem cells in pediatric surgery | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the usage potential and last developments of mesenchymal stem cells in pediatric surgery will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Pediatric Surgery: Diagnosis and Management. Devendra Gupta, Shilpa Sharma, Richard G. Azizkhan.ISBN-13: 978-0071719872  Stem Cells in Clinic and Research. Edited by Ali Gholamrezanezhad, ISBN 978-953-307-797-0 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | In pediatric surgery, the routes of administration of mesenchymal stem cells (intravascular infusion, local percutaneous injection, local intrarticular injection) |
| **2** |  | Mesenchymal stem cells in Graft-Versus-Host Diseases (GVHD) |
| **3** |  | Autoimmune diseases |
| **4** |  | Lung diseases |
| **5** |  | Cardiovascular diseases |
| **6** |  | Cell types in myocardial regeneration |
| **7** |  | Cardiac stem cell therapy in myocardial infarction |
| **8** |  | MID-TERM EXAM |
| **9** |  | Cardiac stem cell therapy in congenital heart disease, liver diseases |
| **10** |  | Inflammatory bowel disease, mesenchymal stem cell therapy in Crohn's disease |
| **11** |  | Osteoarticular diseases include mesenchymal stem cells in pediatric osteoarticular diseases |
| **12** |  | Clinical applications in pediatric osteoarticular diseases (osteogenesis imperfecta, juvenile idiopathic arthritis, simple bone cyst, femoral head osteonecrosis) |
| **13** |  | Duchenne Muscular Dystrophy (DMD), Duchenne Muscular Dystrophy (DMD) mesenchymal stem cell therapy |
| **14** |  | Unresolved issues (cell retention and engraftment, mechanism of stem cell therapy in cardiac failure, route of administration, cell type-autologous or allogeneic) |
| **15** |  | Future applications |
| **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. Hüseyin İLHAN |  |

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| **COURSE CODE** | **522803317** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **BONE AND MUSCULOSKELETAL TISSUE ENGINEERING** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Nusret KÖSE | | 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** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Musculoskeletal system bioengineering, selection of biomaterials, building scaffolds | | | | | | |
| **COURSE AIMS** | | | Learning the muscle-bone structure, selection of biomaterials, building scaffolds and their usage. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, muscle-bone structure, biomaterial selection, building scaffolds and usage will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell and Tissue Engineering Edited by: Song Li, 2011. Tissue Engineering, Stem Cells, and Gene TherapiesEditors: Elçin, Y. Murat, 2003. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Bone tissue structure and function |
| **2** |  | Tendon tissue structure and function |
| **3** |  | Cartilage tissue structure and function |
| **4** |  | Bone healing |
| **5** |  | Biomaterials |
| **6** |  | Metals |
| **7** |  | Ceramics |
| **8** |  | MID-TERM EXAM |
| **9** |  | Polymers |
| **10** |  | Building scaffolds that can be used as an extracellular matrix |
| **11** |  | Ideal properties of building scaffolds |
| **12** |  | Strength of building scaffolding |
| **13** |  | Composite scaffoldings |
| **14** |  | Artificial building scaffoldings |
| **15** |  | Bone and cartilage tissue engineering applications of building scaffolds |
| **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. Nusret KÖSE |  |

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| **COURSE CODE** | **522803318** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL NICHE** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Ferruh YÜCEL | | 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** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell niche, structure, stem cell niche in regenerative medicine | | | | | | |
| **COURSE AIMS** | | | To learn new information about stem cell niche, structure, stem cell niche in regenerative medicine | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, new information about stem cell niche, structure, stem cell niche in regenerative medicine will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Biology in Stem Cell Niche Editors: Turksen, Kursad (Ed.) 2015. Stem Cell Niche Methods and Protocols Editors: Kursad Turksen ISBN: 978-1-62703-507-1 2013. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| --- | --- | --- |
| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Mesenchymal stem cells |
| **2** |  | soluble factors in the microenvironment |
| **3** |  | niche mechanisms (primary maintenance signals, additional signals, asymmetric division) |
| **4** |  | the stem cell niche |
| **5** |  | effects of secretory factors on mesenchymal stem cells |
| **6** |  | paracrine factors and niche structure |
| **7** |  | extracellular matrix proteins as a reservoir of growth factors |
| **8** |  | MID-TERM EXAM |
| **9** |  | extracellular matrix interactions with mesenchymal stem cells |
| **10** |  | extracellular matrix is a functional component of the stem cell niche |
| **11** |  | adhesion in the stem cell niche: biological roles and regulation |
| **12** |  | classes of adhesion molecules that mediate stem cell-niche interactions (cadherin and integrin family) |
| **13** |  | biological functions of adhesion molecules in stem cell regulation (niche anchorage and homing) |
| **14** |  | controlling stem cell self-renewal via signaling |
| **15** |  | the stem cell niche in regenerative medicine |
| **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. Ferruh YÜCEL |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803319** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL PROTEOMIC** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Derya ÜSTÜNER | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Proteomic concept, methods used in stem cell analysis and application areas | | | | | | |
| **COURSE AIMS** | | | To learn proteomic concept, methods used in stem cell analysis and application areas | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, proteomic concept, methods used in stem cell analysis and application areas will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Wang, J., Trowbridge, J.J., Rao, S. and Orkin, S.H., Proteomic studies of stem cells (July 14, 2008), StemBook, ed. The Stem Cell Research Community, StemBook, doi/10.3824/stembook.1.4.1 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| --- | --- | --- |
| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | proteomics concept and stem cells |
| **2** |  | sample preparation and protein extraction |
| **3** |  | two-dimensional electrophoresis |
| **4** |  | mass spectrometry, ms-based protein profiling, ms-based quantitative analysis |
| **5** |  | profiling and differential expression analysis |
| **6** |  | membrane proteomics |
| **7** |  | post-translational modification |
| **8** |  | MID-TERM EXAM |
| **9** |  | heterogeneity of proteome |
| **10** |  | application of protein array to stem cell proteomics |
| **11** |  | secretomics |
| **12** |  | transplantation proteomics |
| **13** |  | stem cell protein networks and signaling pathways for pluripotency |
| **14** |  | proteomic studies of stem cells |
| **15** |  | Future applications |
| **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** |
| Yrd. Doç. Dr. Derya ÜSTÜNER |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803320** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **NEXT GENERATION SEQUENCING AND BIOINFORMATICS IN STEM CELL RESEARCHES** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | New generation sequencing technologies and use in stem cell research | | | | | | |
| **COURSE AIMS** | | | Learning the use of next generation sequencing technologies in stem cell research | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the use of new generation sequencing technologies in stem cell research will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Next Generation Sequencing - Advances, Applications and Challenges", book edited by Jerzy K Kulski, ISBN 978-953-51-2240-1, Published: January 14, 2016. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | DNA methylation data and epigenome new techniques |
| **2** |  | sequencing technologies |
| **3** |  | bioinformatic assays for pluripotency |
| **4** |  | differentiation assays |
| **5** |  | immunophenotype characterization |
| **6** |  | RNA-Seq data production and processing |
| **7** |  | functional analysis |
| **8** |  | MID-TERM EXAM |
| **9** |  | transcription factor binding sites (TFBS) analysis on expressed genes |
| **10** |  | gene expression profiling |
| **11** |  | epigenetic profiles |
| **12** |  | NGS data analysis |
| **13** |  | clinical applications of NGS |
| **14** |  | advances of NGS in therapeutics |
| **15** |  | Applications in stem cell researches |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803321** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **TISSUE ENGINEERING IN PEDIATRIC SURGERY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Baran TOKAR | | 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** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Tissue engineering in pediatric surgery | | | | | | |
| **COURSE AIMS** | | | Learning that applications of tissue engineering in pediatric surgery | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, applications of tissue engineering in pediatric surgery will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Principles of Tissue Engineering Robert Lanza, Robert Langer, Joseph P. Vacanti Academic Press, 2000 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Tissue engineering and biotechnology |
| **2** |  | Cell sourcing (Embryonic and Adult stem cells) |
| **3** |  | Scaffolds and polymers |
| **4** |  | Characteristics of an ideal scaffold |
| **5** |  | Types of scaffolds |
| **6** |  | Bioreactors |
| **7** |  | Tissue engineering and pediatric surgery |
| **8** |  | MID-TERM EXAM |
| **9** |  | Tissue engineering of muscle, cartilage and bone |
| **10** |  | Cardiovascular tissue engineering |
| **11** |  | Pancreas, esophagus and intestinal tissue engineering |
| **12** |  | Liver replacements and tissue engineering |
| **13** |  | Kidney and urinary bladder tissue engineering |
| **14** |  | Lung tissue engineering |
| **15** |  | The future of tissue engineering in Pediatric surgery |
| **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. Baran TOKAR |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803322** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN CARDIOVASCULAR SURGERY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Behçet SEVİN | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell therapies in heart diseases, stem cell therapies in coronary artery diseases | | | | | | |
| **COURSE AIMS** | | | Learning that stem cell therapies in heart diseases, stem cell therapies in coronary artery diseases, stem cell therapies in ischemic mitral insufficiency, stem cell therapy in trans-coronary therapy. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, stem cell therapies in heart diseases, stem cell therapies in coronary artery diseases, stem cell therapies in ischemic mitral regurgitation, stem cell therapies in trans-coronary therapy will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Regenerative Medicine Using Pregnancy-Specific Biological Substances editor: Niranjan Bhattacharya,Phillip Stubblefield  Stem Cell and Gene Therapy for Cardiovascular Disease, 1st Edition. Editor(s) : Perin, Miller, Taylor, Willerson 2015Imprint:Academic PressPrint Book ISBN :9780128018880 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Spectrum of stem cells investigated (mesenchymal stem cells, adipose-derived mesenchymal stem cells, cardiac stem cells, c-kit+ cardiac stem cells) |
| **2** |  | Spectrum of stem cells investigated (cardiosphere-derived cells, embryonic stem cells, induced pluripotent stem cells) |
| **3** |  | Modes of stem cell delivery (transvascular approaches, intracoronary delivery, intravenous infusion, direct injection into the ventricular Wall) |
| **4** |  | Modes of stem cell delivery (transepicardial injection, transendocardial injection, transcoronary vein injection) |
| **5** |  | Potential therapeutic mechanisms of stem cells (differentiation of transplanted stem cells into cardiac cells, formation of new blood vessels from transplanted stem cells, paracrine effect, cell fusion) |
| **6** |  | Stem cell therapy for heart disease |
| **7** |  | Stem cell therapy for coronary artery disease |
| **8** |  | MID-TERM EXAM |
| **9** |  | Stem cell therapy for congestive heart failure |
| **10** |  | Coronary artery bypass grafting and stem cell applications |
| **11** |  | Left ventricular restoration, ischemic mitral regurgitation stem cell therapies |
| **12** |  | Trans-coronary therapy stem cell therapies |
| **13** |  | Peripheral arterial diseases stem cell therapies |
| **14** |  | Chronic obstructive pulmonary disease stem cell therapies |
| **15** |  | Root cell therapies in pleural diseases |
| **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. Behçet SEVİN |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522803323** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN EAR, NOSE AND THROAT DISEASES** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Armağan İNCESULU | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Mesenchymal stem cell therapies in ear, nose and throat surgery | | | | | | |
| **COURSE AIMS** | | | Mesenchymal stem cell therapies in ear, nose and throat surgery, animal models and stem cell applications in hearing loss regeneration studies, learning of future applications | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, mesenchymal stem cell therapies in ear, nose and throat surgery, animal models in hearing loss regeneration studies, stem cell applications and future applications will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cells in Clinic and Research. Edited by Ali Gholamrezanezhad, ISBN 978-953-307-797-0  Ear, Nose, and Throat Diseases. Behrbohm.ISBN:9783136712030 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Mesenchymal stem cell therapies in otorhinolaryngology-head and neck surgery |
| **2** |  | Vocal fold mucosa regeneration (cell therapy, growth factor therapy, mesenchymal stem cell applications) |
| **3** |  | Kohlear damage repair |
| **4** |  | Animal models in hearing loss regeneration studies |
| **5** |  | Hearing loss treatment with mesenchymal stem cells |
| **6** |  | Mesenchymal stem cells in human inner ear treatments |
| **7** |  | Mesenchymal stem cell therapies in the Kohlear hair regeneration (embryonic stem cells, adult stem cells, mesenchymal stem cells) |
| **8** |  | MID-TERM EXAM |
| **9** |  | Pluripotent stem cells and their use in hearing loss |
| **10** |  | Stem cells in squamous head and neck cancers |
| **11** |  | Cell therapy in subglottis stenosis |
| **12** |  | Mesenchymal stem cells (bone, cartilage, fat, dermal matrix replacement, vocal fold, hair cell replacement treatments) in tissue replacement therapy |
| **13** |  | Inner ear stem cell transplantation |
| **14** |  | Clinical trials |
| **15** |  | Future applications |
| **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. Armağan İNCESULU |  |

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| **COURSE CODE** | **522803324** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN UROLOGICAL DISEASES** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. İyimser ÜRE | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Autumn(3.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell therapies in urogenital duct-derived stem / progenitor cells and urological diseases | | | | | | |
| **COURSE AIMS** | | | To learn urogenital duct-derived stem / progenitor cells and stem cell therapies in urological diseases | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, stem cell therapies in urogenital duct-derived stem / progenitor cells and urological diseases will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Mesenchymal Stem Cells for Cell Therapy and Tissue Regeneration in Urology in Regenerative Medicine and Tissue Engineering - Cells and Biomaterials", ed: Daniel Eberli, ISBN 978-953-307-663-8, 2011. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Stem/progenitor cells derived from the genitourinary tract (bladder, kidney, testis, urine) |
| **2** |  | mesenchymal stem cells application in urinary tract tissue regeneration (urothelial cell) |
| **3** |  | mesenchymal stem cells application in urinary tract tissue regeneration (urothelial differentiation of mesenchymal stem cell) |
| **4** |  | stem cells for treatment of bladder dysfunction |
| **5** |  | bladder cell transplantation and regenerative medicine |
| **6** |  | cell therapy for stress urinary incontinence |
| **7** |  | penile endogenous stem cells |
| **8** |  | MID-TERM EXAM |
| **9** |  | erectile dysfunction (mechanism and cause) |
| **10** |  | erectile dysfunction (stem cell therapy in erectile dysfunction) |
| **11** |  | Peyronie’s disease (mechanism) |
| **12** |  | Peyronie’s disease (stem cell therapy in Peyronie’s disease) |
| **13** |  | stem cells in the treatment of infertility |
| **14** |  | application of adipose-derived stem cells for prostate disease |
| **15** |  | application of adipose-derived stem cells for kidney disease |
| **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** |
| Yrd. Doç. Dr. İyimser ÜRE |  |

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| **COURSE CODE** | **522804301** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL DIFFERENTIATION** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Onur UYSAL | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 3 | 2 |  | | 4 | | 7,5 | | Compulsory |
|  | | | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | | | |
| **MID-TERM EXAM** | | | **Activity** | | | **Quantity** | | **Percentage (%)** | |
| 1st Mid-Term | | | 1 | | 40 | |
| 2nd Mid-Term | | |  | |  | |
| Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (………) | | |  | |  | |
| **FINAL EXAM** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Molecular mechanisms of stem cell differentiation | | | | | | |
| **COURSE AIMS** | | | Learning the properties and differentiation mechanisms of stem cells at molecular level | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the differentiation mechanisms of stem cells will be learned at the molecular level. | | | | | | |
| **TEXTBOOK(S)** | | | Essentials of Stem Cell Biology (Second Edition) Edited by:Robert Lanza, John Gearhart, Brigid Hogan, Douglas Melton, Roger Pedersen, E. Donnall Thomas, James Thomson and Sir Ian Wilmut ISBN: 978-0-12-374729-7 2009. Stem Cells, Tissue Engineering and Regenerative Medicine Edited by: David Warburton (University of Southern California, USA) 552pp Feb 2015 ISBN: 978-981-4612-77-7 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Stem cells and their properties |
| **2** |  | cell-matrix interactions |
| **3** |  | matrix structure and organization, matrix chemistry, mechanical properties of the matrix |
| **4** |  | differentiation of stem cells |
| **5** |  | transcription factors in stem cells differentiation |
| **6** |  | signalling pathways controlling stem cells differentiation (Wnt signalling pathway, Hedgehog signalling pathway, TGF β-superfamily signalling pathways) |
| **7** |  | additional regulators of stem cells differentiation (miRNAs in stem cell differentiation) |
| **8** |  | MID-TERM EXAM |
| **9** |  | additional regulators of stem cells differentiation (mechanical stimulation in stem cell differentiation) |
| **10** |  | in vitro differentiation of stem cells |
| **11** |  | in vitro differentiation potential (mesodermal lineages) |
| **12** |  | in vitro differentiation potential (ectodermal lineages) |
| **13** |  | in vitro differentiation potential (endodermal lineages) |
| **14** |  | initiatiation of differentiation process of stem cells |
| **15** |  | selection of a particular differentiation pathway of multipotent stem cells |
| **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** |
| Yrd. Doç. Dr. Onur UYSAL |  |

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| **COURSE CODE** | **522804302** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL LINES IN GMP** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Onur UYSAL | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Optimization and standardization of stem cell culture protocols according to Good Manufacturing Practices in clinical practice | | | | | | |
| **COURSE AIMS** | | | To learn the optimization and standardization of stem cell culture protocols according to Good Manufacturing Practices in clinical applications | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the optimization and standardization of stem cell culture protocols according to Good Manufacturing Practices will be learned in clinical applications. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cells and Good Manufacturing Practices, Methods, Protocols, and Regulations. Turksen, Kursad (Ed.) 2015 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | GMP in stem cell-based therapies |
| **2** |  | GMP and culture conditions |
| **3** |  | optimization and standardization of stem cell culture protocols for clinical use |
| **4** |  | GMP-grade stem cells |
| **5** |  | GMP validation of materials and protocols (SOPs) |
| **6** |  | derivation, culture and storage in GMP facility |
| **7** |  | quality control |
| **8** |  | MID-TERM EXAM |
| **9** |  | GMP biosafety |
| **10** |  | validation of functionality according to applications |
| **11** |  | optimization and standardization of stem cells differentiation protocols |
| **12** |  | GMP-grade stem cells-derived cell line |
| **13** |  | mesenchymal stem cell manufacturing for clinical use |
| **14** |  | GMP production of MSCs |
| **15** |  | clinical trials |
| **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** |
| Yrd. Doç. Dr. Onur UYSAL |  |

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| **COURSE CODE** | **522804303** | **DEPARTMENT** | Stem Cell | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN GENERAL SURGERY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Enver İHTİYAR | | 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(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell applications in general surgery diseases. | | | | | | |
| **COURSE AIMS** | | | Learning of stem cell therapies in general surgery diseases and especially cancer treatment. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, stem cell therapies will be learned in general surgical diseases and especially cancer treatment. | | | | | | |
| **TEXTBOOK(S)** | | | Progress in Stem Cell Transplantation,Edited by Taner Demirer, ISBN 978-953-51-2227-2.  Pluripotent Stem Cell Biology - Advances in Mechanisms, Methods and Models,Edited by Craig S. Atwood and Sivan Vadakkadath Meethal, ISBN 978-953-51-1590-8. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Plasticity of mesenchymal stem cells |
| **2** |  | Immun system and immunomodulation |
| **3** |  | Potential risks of mesenchymal stem cell therapies |
| **4** |  | Repair characteristics of mesenchymal stem cells (liver repair, kidney repair, colon repair, fibroblastic differentiation) |
| **5** |  | Mesenchymal stem cells in liver transplantation: risks and benefits |
| **6** |  | Cytokines secreted by mesenchymal stem cells in liver injury |
| **7** |  | Clinical studies on mesenchymal stem cells in the treatment of liver diseases |
| **8** |  | MID-TERM EXAM |
| **9** |  | Mesenchymal stem cell treatment in acute and chronic renal ischemia |
| **10** |  | Mesenchymal stem cell treatment in renal transplantation |
| **11** |  | Potential role of mesenchymal stem cells in pancreatic islet transplantation |
| **12** |  | Clinical results of pancreatic islet transplantation |
| **13** |  | Unresolved problems in human islet transplantation |
| **14** |  | Inflammatory bowel disease and mesenchymal stem cells |
| **15** |  | Effect of mesenchymal stem cells on tumor mechanism, mesenchymal stem cells after cancer and regenerative therapy |
| **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. Enver İHTİYAR |  |

|  |  |  |  |  |  |
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| **COURSE CODE** | **522804304** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **APPLICATIONS OF CELL THERAPY IN PLASTIC SURGERY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Aydan KÖSE | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell therapies in plastic surgery applications, wound and burn healing approaches, clinical stem cell research | | | | | | |
| **COURSE AIMS** | | | To learn the efficacy of stem cell therapies in plastic surgery and burn cases | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the effectiveness of stem cell therapies in plastic surgery and burn cases will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Qingfeng Li and Mei Yang (2012). Stem Cell Research: A New Era for Reconstructive Surgery, Selected Topics in Plastic Reconstructive Surgery, Dr Stefan Danilla (Ed.) Innovations in Plastic and Aesthetic Surgery Editors: Eisenmann-Klein, Marita, Neuhann-Lorenz 2008. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Stem cell therapy |
| **2** |  | stem cells and bone regeneration |
| **3** |  | cartilage tissue engineering |
| **4** |  | stem cells and vascularization |
| **5** |  | stem cells and breast tissue engineering |
| **6** |  | wound healing, pathophysiology of normal wound healing, phases of normal wound healing (inflammatory phase, proliferative phase, remodeling phase) |
| **7** |  | nonhealing, chronic wounds, traditional approaches to wound healing |
| **8** |  | MID-TERM EXAM |
| **9** |  | stem cells and skin regeneration |
| **10** |  | stem cell populations for cutaneous repair (mesenchymal stem cells, bone marrow-derived MSCs, adipose-derived mscs, cord blood and extra-fetal tissue, skin stem cells, embryonic and induced pluripotent stem cells) |
| **11** |  | skin tissue engineering, scaffolds and wound healing |
| **12** |  | skin grafts (allogenic skin graft, autogenic skin graft, uncultured skin autograft, cultured skin autograft, cell cultured epithelial autograft) |
| **13** |  | physiology of burn wound healing |
| **14** |  | stem cell therapies on experimental burn models, stem cells and burn wound healing |
| **15** |  | clinical studies with cell-based therapy |
| **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. Aydan KÖSE |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522804305** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL AND DIABETES** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Nur KEBAPÇI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell applications in the treatment of diabetes | | | | | | |
| **COURSE AIMS** | | | Learning to obtain beta cells from stem cells in the treatment of type 1 and type 2 diabetes, learning problems and other applications. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, studies on obtaining beta cells from stem cells in the treatment of type 1 and type 2 diabetes, problems encountered and other applications will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell Therapy for Diabetes (Stem Cell Biology and Regenerative Medicine) by Shimon Efrat. ISBN-13: 978-1607613657.  Progress in Stem Cell Transplantation,Edited by Taner Demirer, ISBN 978-953-51-2227-2. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Pancreas structure and function |
| **2** |  | Definition and pathogenesis of diabetes |
| **3** |  | Type 1 diabetes treatment and problems |
| **4** |  | Type 2 diabetes treatment and problems |
| **5** |  | In the treatment of diabetes, stem cell sources (embryonic stem cells, pancreatic islet stem cells, pancreatic duct root cells, pancreatic stromal cells, hematopoietic stem cells, inducible stem cells, mesenchymal stem cells) |
| **6** |  | Stem cell approaches in the treatment of type 1 diabetes |
| **7** |  | Stem cell approaches in the treatment of type 2 diabetes |
| **8** |  | MID-TERM EXAM |
| **9** |  | Beta cell production and transplantation from pluripotent stem cells |
| **10** |  | Post-transplantation immunomechanism |
| **11** |  | High blood sugar reduction studies with stem cells |
| **12** |  | Stem cell applications in diabetic wounds |
| **13** |  | Advantages and problems in stem cell application |
| **14** |  | Regenerative medicine |
| **15** |  | Future applications |
| **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. Nur KEBAPÇI |  |

|  |  |  |  |  |  |
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| **COURSE CODE** | **522804306** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **CLINICAL TISSUE ENGINEERING** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Hüseyin AVCI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | | Techniques used in tissue engineering. | | | | | | |
| **COURSE CONTENT** | | | To be able to understand the latest techniques and application areas used in tissue engineering. | | | | | | |
| **COURSE AIMS** | | | At the end of this course, the latest techniques and application areas used in tissue engineering will be learned. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, XXXX will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell and Tissue Engineering Edited by: Song Li, 2011. Tissue Engineering, Stem Cells, and Gene TherapiesEditors: Elçin, Y. Murat, 2003. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Introduction to tissue engineering |
| **2** |  | Biotransport |
| **3** |  | Bioelectric |
| **4** |  | Biomechanics |
| **5** |  | Fluid mechanics |
| **6** |  | Mechanism of solid bodies |
| **7** |  | Viscoelasticity |
| **8** |  | MID-TERM EXAM |
| **9** |  | From living to to industry: biomaterials |
| **10** |  | From industry to living organisms: biomaterials |
| **11** |  | programmed self-assembly (bottom up technique) |
| **12** |  | Three-dimensional (3D) bioprinting |
| **13** |  | the role of bioreactors in tissue engineering |
| **14** |  | use of scaffolds in clinical researches |
| **15** |  | future applications |
| **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** |
| Yrd. Doç.Dr. Hüseyin AVCI |  |

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| **COURSE CODE** | **522804307** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **NEURAL STEM CELL** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Emel ULUPINAR | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Neural stem cell biology, isolation and culture of neural stem cells, neural stem cell sources for therapeutic use | | | | | | |
| **COURSE AIMS** | | | To learn neural stem cell biology, isolation and culture of neural stem cells, neural stem cell sources in therapeutic use | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, neural stem cell biology, isolation and culture of neural stem cells, neural stem cell sources in therapeutic use will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Neural Stem Cells Methods and Protocols Editors: Leslie P. Weiner ISBN: 978-1-58829-846-1 2008. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| --- | --- | --- |
| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Neural stem cell biology |
| **2** |  | adult neural stem cell niches |
| **3** |  | neural stem cells in the developing brain |
| **4** |  | the function of neural stem cells in vivo |
| **5** |  | neural induction of pluripotent stem cells |
| **6** |  | neural differentiation of pluripotent stem cells |
| **7** |  | isolation of neural stem cells |
| **8** |  | MID-TERM EXAM |
| **9** |  | culture of neural stem cells |
| **10** |  | sources of neural stem cells for therapeutic use |
| **11** |  | mobilization of endogenous neural stem cells |
| **12** |  | neural stem cells for cell replacement approaches |
| **13** |  | neural stem cells for cell replacement approaches: requirements and available in vitro systems |
| **14** |  | preclinical and clinical researches in neural stem cell |
| **15** |  | neural stem cell transplantation in central nervous system disorders |
| **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. Emel ULUPINAR |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522804308** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **CURRENT ASPECTS OF TISSUE ENGINEERING** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Yrd. Doç. Dr. Mine TOKER | | 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(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | the use of stem cells in tissue engineering and cell-based therapeutic approaches | | | | | | |
| **COURSE AIMS** | | | Learning using stem cells in tissue engineering and cell based therapeutic approaches | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the use of stem cells in tissue engineering and cell-based therapeutical approaches will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell and Tissue Engineering Edited by: Song Li, 2011. Tissue Engineering, Stem Cells, and Gene TherapiesEditors: Elçin, Y. Murat, 2003. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Cell based therapeutical tools and their ethical debates |
| **2** |  | the analysis of tissue dinamics |
| **3** |  | tissue and cell homoestasis |
| **4** |  | cell signal network |
| **5** |  | the utilization of extracellular matrix components (ECM) in tissue engineering |
| **6** |  | the definition of ECM components and biocompatible materials |
| **7** |  | the definition of cell sources |
| **8** |  | MID-TERM EXAM |
| **9** |  | cell culture techniques |
| **10** |  | cell differentiation: the importance of 2D and 3D culture techniques |
| **11** |  | the potential utilization of stem cells in tissue engineering |
| **12** |  | the architecture in tissue engineering |
| **13** |  | Tissue engineering For Regeneration of Damaged Tissues |
| **14** |  | Bone, cartilage, vascular and nerve tissu engineering |
| **15** |  | Cardiac, pancreas, skin, and nerve tissue engineering |
| **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** |
| Yrd. Doç. Dr. Mine TOKER |  |

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| **COURSE CODE** | **522804309** | **DEPARTMENT** | Stem Cell | | |
| **COURSE NAME** | | **HUMAN REGENERATION** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Cell and tissue regeneration in adult human and animals, molecular and cellular basis of regeneration | | | | | | |
| **COURSE AIMS** | | | To learn regeneration of adult human and animal cells and tissues, cellular molecular bases of regeneration, tissue engineering and applications in regenerative medicine | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, regeneration of adult human and animal cells and tissues, cellular molecular bases of regeneration, tissue engineering and applications in regenerative medicine will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell Repair and Regeneration Volume 3 Edited by: Nataša Levičar 2008. Regeneration: Stem Cells and Beyond Eds: Heber-Katz, Ellen (Ed.) 2004. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | The biology of human mesenchymal stem cells |
| **2** |  | mesenchymal stem cells: from culture to clinic |
| **3** |  | towards broader approaches to stem cell signaling and therapeutics |
| **4** |  | pluripotent stem cells from the early embryo |
| **5** |  | tissue engineering and regeneration as a therapeutic alternative to transplantation |
| **6** |  | cell and tissue regeneration in adult human and animals |
| **7** |  | molecular and cellular basis of regeneration |
| **8** |  | MID-TERM EXAM |
| **9** |  | tissue and organ regeneration |
| **10** |  | regeneration of model organisms and animals (planarian and vertebrates: amphibians, mice, rats) |
| **11** |  | finger regeneration |
| **12** |  | regeneration of the ribs, liver regeneration |
| **13** |  | regeneration of the kidney, heart regeneration |
| **14** |  | stem cells in regenerative medicine |
| **15** |  | tissue-engineering in regenerative medicine and applications |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI |  |

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| **COURSE CODE** | **522804310** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN NEUROSURGERY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Prof. Dr. Erhan COŞAN | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Stem cell therapies in the cases of neurosurgery | | | | | | |
| **COURSE AIMS** | | | To learn new approaches about stem cell therapies in cases of cerebral surgery and trauma | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, new approaches to stem cell therapies will be learned in the cases of neurosurgery and in trauma. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell Therapy in Neurological Disorders 2014 by NeuroGen Brain and Spine Institute Pvt. Ltd. ISBN 81-86876-06-5 Ms. Akshata Shetty | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Sources and characteristics of mesenchymal stem cells |
| **2** |  | Phenotype of mesenchymal stem cells |
| **3** |  | Action and safety profile of mesenchymal stem cells |
| **4** |  | Stem cells in CNS regeneration and plasticity |
| **5** |  | Neuronal stem cells |
| **6** |  | The extracellular matrix: A niche for neuronal stem cells |
| **7** |  | Stem cell therapy for ischemic stroke |
| **8** |  | MID-TERM EXAM |
| **9** |  | Animal Models of traumatic brain injury |
| **10** |  | Stem cell therapy for traumatic brain injury |
| **11** |  | Stem cell therapy for spinal cord injury |
| **12** |  | Stem cell therapy for brain tumour |
| **13** |  | Stem cell therapy for temporal lobe epilepsy |
| **14** |  | Stem cell therapy for degenerative disc disease |
| **15** |  | Clinical trials |
| **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. Erhan COŞAN |  |

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| **COURSE CODE** | **522804311** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELL APPLICATIONS IN PEDIATRIC NEUROLOGY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Kürşat Can ÇAKMAN | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring(2.mt) | 2 | 0 |  | | 2 | | 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 | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 50 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Use of stem cells in neurological diseases such as motor neuron diseases | | | | | | |
| **COURSE AIMS** | | | Stem cell use in neurological diseases such as motor neuron diseases, autism and cerebral palsy | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, stem cell usage will be learned in neurological diseases such as motor neuron diseases, autism and cerebral palsy. | | | | | | |
| **TEXTBOOK(S)** | | | Neural Stem Cell Assays, editor(s): Navjot Kaur, Mohan C. Vemuri. Online ISBN: 9781118308295 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Stem cell therapies in motor neuron diseases |
| **2** |  | Stem cell therapies in cerebral palsi |
| **3** |  | Stem cell therapies in autism |
| **4** |  | Stem cell therapies in traumatic brain injury |
| **5** |  | Stem cell therapies in spinal cord injury |
| **6** |  | Subacute sclerosing panencephalitis stem cell therapies |
| **7** |  | Stem cell therapies in pediatric myelin diseases |
| **8** |  | MID-TERM EXAM |
| **9** |  | Stem cell therapies Osteogenesis imperfecta |
| **10** |  | Stem cell therapies Muscular dystrophy |
| **11** |  | Stem cell therapies Bronchopulmonary dysplasia |
| **12** |  | Stem cell therapies in cardiac valvular diseases |
| **13** |  | Stem cell therapies Diabetes mellitus |
| **14** |  | Stem cell therapies in lysosomal storage disease |
| **15** |  | Stem cell therapies in leukodystrophies, clinical studies |
| **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** |
| Doç. Dr. Kürşat Can ÇAKMAN |  |

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| **COURSE CODE** | **522804312** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **STEM CELLS IN DISEASE AND PHYSIOLOGY** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Dr. Öğr. Üyesi Sibel GÜNEŞ | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Investigating human disease using stem cell models, Stem cell-derived vasculature: A potent and multidimensional technology for basic research, disease modeling, and tissue engineering., Nano and microcarriers to improve stem cell behaviour for neuroregenerative medicine strategies: Application to Huntington's disease., Induced neural stem cells as a means of treatment in Huntington's disease., Alzheimer's disease, dementia, and stem cell therapy., An Update on Human Stem Cell-Based Therapy in Parkinson's Disease., Stem cell treatment of degenerative eye disease., Stem Cell Therapies for Reversing Vision Loss., Stem cell therapy for kidney disease., Progress of the application of stem cell therapy for end-stage liver disease, Complications Following Stem Cell Therapy in Inflammatory Bowel Disease., Fractones: extracellular matrix niche controlling stem cell fate and growth factor activity in the brain in health and disease, Wnt/catenin signaling in adult stem cell physiology and disease., Fundamental Principles of Stem Cell Banking. | | | | | | |
| **COURSE AIMS** | | | Gaining knowledge about examination, analysis and development of stem cell behavior in disease treatment strategies by using medicine and engineering techniques. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, stem cell behavior in disease treatment strategies will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | Stem Cell Biology in Health and Disease, Editör: Thomas Dittmar, 2009.  Developmental and Stem Cell Biology in Health and Disease, Ahmed El-Hashash 2014.  Stem Cells and Human Diseases, Editörler: Rakesh Srivastava, Sharmila Shankar, 2012. | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Investigating human disease using stem cell models |
| **2** |  | Stem cell-derived vasculature: A potent and multidimensional technology for basic research, disease modeling, and tissue engineering. |
| **3** |  | Nano and microcarriers to improve stem cell behaviour for neuroregenerative medicine strategies: Application to Huntington's disease. |
| **4** |  | Induced neural stem cells as a means of treatment in Huntington's disease. |
| **5** |  | Alzheimer's disease, dementia, and stem cell therapy. |
| **6** |  | An Update on Human Stem Cell-Based Therapy in Parkinson's Disease. |
| **7** |  | Stem cell treatment of degenerative eye disease. |
| **8** |  | MID-TERM EXAM |
| **9** |  | Stem Cell Therapies for Reversing Vision Loss. |
| **10** |  | Stem cell therapy for kidney disease. |
| **11** |  | Progress of the application of stem cell therapy for end-stage liver disease |
| **12** |  | Complications Following Stem Cell Therapy in Inflammatory Bowel Disease. |
| **13** |  | Fractones: extracellular matrix niche controlling stem cell fate and growth factor activity in the brain in health and disease |
| **14** |  | Wnt/catenin signaling in adult stem cell physiology and disease. |
| **15** |  | Fundamental Principles of Stem Cell Banking. |
| **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** |
| Dr. Öğr. Üyesi Sibel GÜNEŞ | 13.12.2018 |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522804313** | **DEPARTMENT** | **STEM CELL** | | |
| **COURSE NAME** | | **GENE TRANSFER TECHNOLOGIES IN STEM CELLS** | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Ayla EKER SARIBOYACI | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring | 3 | 2 |  | | 4 | | 7,5 | |  |
|  | | | | | | | | | |
| **ASSESMENT CRITERIA** | | | | | | | | | |
| **MID-TERM EXAM** | | | **Activity** | | | **Quantity** | | **Percentage (%)** | |
| 1st Mid-Term | | | 1 | | 40 | |
| 2nd Mid-Term | | |  | |  | |
| Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (………) | | |  | |  | |
| **FINAL EXAM** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | The content of this course: Gene transfer vectors, Gene transfer techniques: Genetic methods, Gene transfer techniques: Chemical methods, Gene transfer techniques: Physical / mechanical methods, Gene expression inhibition (knocking out or silencing), Gene insertion and gene deletion techniques, controlled gene expression, gene therapy approaches in stem cells. | | | | | | |
| **COURSE AIMS** | | | The aim of this course: Gaining the knowledge and skill of molecular structure and usage purpose of current gene transfer methods by considering stem cell properties  - Developing laboratory skills in gene transfer to stem cells. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course: which gene transfer should be made and how the stem cells are taken into consideration.will be learned | | | | | | |
| **TEXTBOOK(S)** | | | “Primary and Stem Cells: Gene Transfer Technologies and Applications”  1st ed. 2012 Edition  “Gene Delivery Approaches for Mesenchymal Stem Cell Therapy: Strategies to Increase Efficiency and Specificity.” [Stem Cell Rev.](https://www.ncbi.nlm.nih.gov/pubmed/28815481) 2017 “Gene Biotechnology” 1st ed. 2016 Edition | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | The basis of gene transfer approaches to stem cells |
| **2** |  | Gene transfer vectors and elements |
| **3** |  | Gene transfer techniques: biological methods |
| **4** |  | Gene transfer techniques: chemical methods |
| **5** |  | Gene transfer techniques: physical / mechanical methods |
| **6** |  | Gene expression inhibition (knockout or silencing) |
| **7** |  | Literature study |
| **8** |  | MID-TERM EXAM |
| **9** |  | Gene insertion and gene deletion techniques |
| **10** |  | Literature study |
| **11** |  | Controlled gene expression |
| **12** |  | Literature study |
| **13** |  | Gene therapy approaches in stem cells |
| **14** |  | Literature study |
| **15** |  | Literature study |
| **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** |
| Doç. Dr. Ayla EKER SARIBOYACI | **13.12.2018** |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522804316** | **DEPARTMENT** | Stem Cell | | |
| **COURSE NAME** | | Principles of mechanotransduction and mechanobiology | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Doç. Dr. Eray ATALAY | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring (2.mt) | 2 | 0 |  | | 2 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Basics of mechanobiology at the molecular, cellular and tissue level and its effect on tissue remodelling | | | | | | |
| **COURSE AIMS** | | | Understanding the basic principles of mechanobiology and its impact at the cellular and tissue level | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the student will have an understanding of the basic of mechanobiology and mechanotransduction, their impact on cell behavior such as differentiation and migration along with its genomic effects and how mechanobiology can be exploited in regenerative medicine and tissue engineering. Furthermore, a brief introduction will be provided on cell and matrix mechanical characterization. | | | | | | |
| **TEXTBOOK(S)** | | | Atala A, Lanza R, Mikos T, Nerem R. Principles of Regenerative Medicine: Elsevier Science, 2018. | | | | | | |
| **REFERENCES** | | | Tee S, Bausch AR, and Janmey PA. The mechanical cell. Curr. Biol. 2009; 19(17):R745-8. [PMID: 19906576]  Ingber DE. Cellular tensegrity: defining new rules of biological design that govern the cytoskeleton. J. Cell. Sci. 1993; 104 ( Pt 3):613-27. [PMID: 8314865]  Ingber DE. Tensegrity I. Cell structure and hierarchical systems biology. J. Cell. Sci. 2003; 116(Pt 7):1157-73. [PMID: 12615960]  Wirtz D. Particle-tracking microrheology of living cells: principles and applications. Annu Rev Biophys 2009; 38:301-26. [PMID: 19416071]  Gardel ML, Shin JH, MacKintosh FC, Mahadevan L, Matsudaira P, and Weitz DA. Elastic behavior of cross-linked and bundled actin networks. Science 2004; 304(5675):1301-5. [PMID: 15166374]  Storm C, Pastore JJ, MacKintosh FC, Lubensky TC, and Janmey PA. Nonlinear elasticity in biological gels. Nature 2005; 435(7039):191-4. [PMID: 15889088]  Koenderink GH, Dogic Z, Nakamura F, Bendix PM, MacKintosh FC, Hartwig JH, Stossel TP, and Weitz DA. An active biopolymer network controlled by molecular motors. Proc. Natl. Acad. Sci. U.S.A. 2009; 106(36):15192-7. [PMID: 19667200]  Zemel A, Bischofs IB, and Safran SA. Active elasticity of gels with contractile cells. Phys. Rev. Lett. 2006; 97(12):128103. [PMID: 17026002]  Zemel A, Rehfeldt F, Brown AEX, Discher DE, and Safran SA. Cell shape, spreading symmetry and the polarization of stress-fibers in cells. J Phys Condens Matter 2010; 22(19):194110. [PMID: 20458358] | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Introduction to biomechanics and basic principles |
| **2** |  | Introduction to mechanotransduction 1 |
| **3** |  | Introduction to mechanotransduction 1 |
| **4** |  | Journal club |
| **5** |  | Mechanical link between the cell and the matrix |
| **6** |  | Journal club |
| **7** |  | Mechanotransduction and fibrosis |
| **8** |  | MID-TERM EXAM |
| **9** |  | Mechanotransduction and tumor development |
| **10** |  | Mechanical properties of the matrix in relation to stem cell fate |
| **11** |  | Journal club |
| **12** |  | Mechanical determinants of tissue development (morphogenesis) |
| **13** |  | Mechanobiology and biomechanics in tissue engineering |
| **14** |  | Journal club |
| **15** |  | Basics of cellular and matrix mechanical characterization |
| **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** |
| Doç. Dr. Eray ATALAY | 25.11.2021 |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522804317** | **DEPARTMENT** | STEM CELL | | |
| **COURSE NAME** | | Cellular and molecular mechanisms of autoimmune diseases | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Öğr. Gör. Dr. Tuğba SEMERCİ SEVİMLİ | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring (4.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Examining the molecular basis of autoimmune diseases and examining current therapy approaches by considering stem cell properties. | | | | | | |
| **COURSE AIMS** | | | - To direct research on stem cell therapy approaches by considering the molecular basis of autoimmune diseases and stem cell properties.  -Development of laboratory skills in in vitro disease models. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the molecular basis of autoimmune diseases and how stem cell applications take place in the treatment will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | “Stem Cell Transplantation for Autoimmune Diseases and Inflammation”Springer Nature Switzerland AG 2019, Print ISBN 978-3-030-23420-1“Autoimmune Diseases Contributing Factors, Specific Cases of Autoimmune Diseases, and Stem Cell and Other Therapies”Published: July 25th 2012, DOI: 10.5772/2896, ISBN: 978-953-51-0693-7 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Autoimmune disease prevalence and molecular basis |
| **2** |  | Immunosuppression and stem cell |
| **3** |  | Immune regulation and stem cell |
| **4** |  | Stem cell therapy approaches in autoimmune diseases |
| **5** |  | Production and transplantation of stem cells for regenerative purposes |
| **6** |  | Hematopoietic stem cell transplantation and its importance in autoimmune diseases |
| **7** |  | Adipose tissue-derived mesenchymal stem cell transplantation and its importance in autoimmune diseases |
| **8** |  | MID-TERM EXAM |
| **9** |  | Genetically modified stem cell therapy in autoimmune diseases |
| **10** |  | Interferon-gamma modified stem cell therapy in autoimmune diseases |
| **11** |  | Stem cell therapy approaches in Inflammatory Bowel Diseases (IBD) |
| **12** |  | Stem cell therapy approaches in Graves' Disease |
| **13** |  | Stem cell therapy approaches in Urticaria |
| **14** |  | Stem cell therapy approaches in Systemic Lupus Erythematosus (SLE) |
| **15** |  | Stem cell therapy approaches in Myasthenia Gravis |
| **16** |  | Stem cell therapy approaches in Familial Mediterranean Fever (FMF) |
| **17** |  | Stem cell therapy approaches in Addison's Disease |
| **18** |  | 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** |
| Öğr. Gör. Dr. Tuğba SEMERCİ SEVİMLİ | 27.11.2021 |

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| --- | --- | --- | --- | --- | --- |
| **COURSE CODE** | **522804318** | **DEPARTMENT** | STEM CELL | | |
| **COURSE NAME** | | Current Approaches in Gene and Stem Cell Therapy | | | |
| **INSTRUCTOR NAME** | | **COURSE LANGUAGE** | **COURSE CATAGORY** | | |
| Öğr. Gör. Dr. Tuğba SEMERCİ SEVİMLİ | | Turkish | **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** | | | | |
| **TEORIC** | **PRACTICE** | **LABORATORY** | | **CREDIT** | | **ECTS** | | **TYPE** |
| Spring (2.mt) | 3 | 2 |  | | 4 | | 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** | | | Quiz | | |  | |  | |
| Homework | | |  | |  | |
| Project | | |  | |  | |
| Oral Exam | | |  | |  | |
| Other (Written Exam) | | | 1 | | 60 | |
| **MAKE-UP EXAM** | | | **Oral** | **Written** | | **Oral and Written** | | **Multiple Choice** | |
|  | **X** | |  | |  | |
| **PREREQUISITE(S)** | | |  | | | | | | |
| **COURSE CONTENT** | | | Importance of genomic and cellular regulation technologies in gene and stem cell therapy | | | | | | |
| **COURSE AIMS** | | | -Orientation to molecular research in gene and stem cell therapy.  -Development of laboratory skills. | | | | | | |
| **COURSE OBJECTIVES** | | | At the end of this course, the importance of genomic and cellular regulation technologies, which have a wide application in gene and stem cell therapy, will be learned. | | | | | | |
| **TEXTBOOK(S)** | | | A Handbook of Gene and Cell Therapy by Clévio Nóbrega, Liliana Mendonça, et al. | Jun 28, 2020Regulatory Aspects of Gene Therapy and Cell Therapy Products: A Global Perspective (Advances in Experimental Medicine and Biology, 871) by Maria Cristina Galli and Mercedes Serabian | Sep 25, 2015 | | | | | | |
| **REFERENCES** | | | Electronic databases and scientific books about the subject | | | | | | |

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| **COURSE SYLLABUS** | | |
| **WEEK** | **DATE** | **SUBJECTS/TOPICS** |
| **1** |  | Gene therapy, the end point and expectations |
| **2** |  | Therapeutic gene regulation |
| **3** |  | Ex vivo and in vivo gene regulation |
| **4** |  | CRISPR and other gene regulation technologies |
| **5** |  | Cellular therapy potential and advantages |
| **6** |  | Methods of generating RNAi in stem cells and RNAi in stem cell therapies |
| **7** |  | Induced pluripotent stem cells and RNAi |
| **8** |  | MID-TERM EXAM |
| **9** |  | Nanoparticle RNAi transport systems in stem cells |
| **10** |  | Combination of RNAi and stem cells in the treatment of CNS diseases |
| **11** |  | Combination of RNAi and stem cells in cartilage damage treatments |
| **12** |  | Combination of RNAi and stem cells in the treatment of hematological malignancies |
| **13** |  | Combination of RNAi and stem cells in the treatment of congenital diseases |
| **14** |  | Combination of RNAi and stem cells in the treatment of autoimmune diseases |
| **15** |  | Cancer stem cells and RNAi |
| **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** |
| Öğr. Gör. Dr. Tuğba SEMERCİ SEVİMLİ | 27.11.2021 |