



	2022-2023 Academic Year List of Courses Offered in Foreign Language										
	Institute of Health Sciences Sağlık Bilimleri Enstitüsü										
	Department <i>Bölüm</i>	Course Code Ders Kodu	ECTS AKTS	Course Title Dersin Adı	Semester <i>Dönem</i>	Course Content Dersin İçeriği	Academic Staff Dersi Veren Öğretim Elemanı	Online Available <i>Çevrimiçi</i>			
1	Gene and Cell Therapy Gen ve Hücre Tedavisi	7002	7	Scientific Project Writing Techniques	Spring	General overview of the genome structure and organization of human genome and genomes of various different microorganisms, providing students with detailed knowledge on various different basic and advanced techniques used in DNA manipulation and proteomics approaches, and discussion of the purpose and principles of use of these techniques in genome-based research.	Prof. Dr. Ahter Dilşad Şanlıoğlu	-			
2	Gene and Cell Therapy Gen ve Hücre Tedavisi	7004	7	Tissue Originated Stem Cells	Spring	Introduction of significant laboratory techniques used in isolation, characterization, culturing, genetic manipulation and reprogramming of stem cells, and evaluation of the potential use of stem cells in human diseases and injuries.	Prof. Dr. Ahter Dilşad Şanlıoğlu	-			
3	Gene and Cell Therapy Gen ve Hücre Tedavisi	7006	7	Non-viral Gene Delivery Systems	Spring	Therapeutic application of DNA pharmaceuticals is limited due to the stability problems of DNA in the circulation. Naked DNA is rapidly eliminated from the circulation after intravenous administration, due to the digestion by nucleases and to the hepatic uptake clearance. The development of effective and safer systems useful for in vivo transfection is needed in order to develop medicines for gene therapy. Gene delivery systems include viral and non-viral vectors. Viral vectors are the most effective, but their application is limited by their immunogenicity and oncogenicity. Non-viral vectors, however, are safer, of low cost and more reproducible. This course discusses physical and chemical non-viral gene transfer methods and non-viral particular and vesicular delivery systems.	Prof. Dr. Salih Şanhoğlu	-			
4	Gene and Cell Therapy Gen ve Hücre Tedavisi	7008	7	Quality of Biological/Biotechnology- Derived/Biosimilar Medicinal Products	Spring	This course aims to provide basic knowledge about the production and formulation of pharmaceuticals derived by recombinant DNA technology, peptide protein delivery systems, non-viral DNA delivery systems and regulatory issues about biopharmaceuticals	Dr. Öğr. Üyesi Devrim Demir Dora	-			
5	Gene and Cell Therapy Gen ve Hücre Tedavisi	7010	7	Mast Cells and Mast Cell-Targeted Therapeutic Strategies	Spring	This course will cover the general phenotypic and functional features of mast cells and their involvement in various physiologic and pathologic conditions, and also involve the discussion of therapeutic implications of mast cells in various diseases, such as neurodegenerative diseases, tumor growth and inflammatory/angiogenesis-related diseases	Doç. Dr. A. Yasemin Göksu Erol	-			
6	Gene and Cell Therapy Gen ve Hücre Tedavisi	7012	7	Medical Physiology I	Spring	Description and discussion of the physiological functions of blood, heart, circulation, respiration and kidneys; understanding the regulatory functions of these systems in homeostasis under basal conditions.	Doç. Dr. Mehmet Bülbül	-			

7	Gene and Cell Therapy Gen ve Hücre Tedavisi	7014	7	Hallmarks of Cancer	Spring	The objective of this course is to introduce common characteristics of cancer through discussion of the Hallmarks of Cancer as described by Hanahan and Weinberg in their seminal papers of 2000 and 2011. Molecular and cellular mechanisms involved in initiation, progression and spread of cancer will be covered. One major emphasis will be on current therapy strategies and novel developments within targeted cancer therapydiseases and gene therapy are given special emphasis.	Dr. Öğr. Üyesi Hande Koçak	-
8	Gene and Cell Therapy Gen ve Hücre Tedavisi	7016	4	Reprogenetics	Spring	Description of the molecular biological mechanisms during oogenesis, spermatogenesis and early embryogenesis, and discussion of the current improvements in the molecular biological events during these early developmental stages.	Doç. Dr. Saffet Öztürk	-
9	Gene and Cell Therapy Gen ve Hücre Tedavisi	7018	7	Calcium Signaling	Spring	Calcium ions (Ca2+) and signaling impact nearly every aspect of cellular life. The objective of the course is to describe the fundamental molecular processes involved in maintaining intracellular Ca2+ homeostasis, and their roles in the generation and decoding of Ca2+ and Ca2+-mediated signals. At the end of this course, the students will learn about the molecules, structures, ion-channels, and pumps involved in calcium signaling to maintain intracellular calcium homeostasis. In addition, the students will describe the principles of common methods including those of microscope-based fluorometry in living cells, confocal and multiphoton imaging and electrophysiology used for calcium imaging. Moreover, they will be able to analyze and interpret the existing literatures related to calcium signaling critically.	Doç. Dr. Soner Doğan	-
10	Gene and Cell Therapy Gen ve Hücre Tedavisi	7020	7	Microbial Biotechnology	Spring	This course provides an overview of how microbes (e.g., bacteria, and yeast) are manipulated to solve practical problems through biotechnology. Topics include basics in microbial life, ecology and metabolism, methods used in microbial technology, industrial microbiology, microbes in drug development.	Prof. Dr. Mehmet İnan	-
11	Gene and Cell Therapy Gen ve Hücre Tedavisi	7022	7	Stem Cell and Regenerative Medicine	Spring	Experimental studies show that stem cells are important in immune system modulation and give effective results on the treatment approach in many different diseases in cellular treatments. In vitro and in vivo experimental studies demonstrate the efficacy of mesenchymal stem cells in autoimmune diseases, spinal cord injuries, and repair of tissue damage. In this course, the effects of stem cells on regenerative medicine, ethical factors and experimental approaches will be discussed.	Prof. Dr. Tunç Akkoç	-
12	Gene and Cell Therapy Gen ve Hücre Tedavisi	7026	6	Applications of Bioinformatics-II	Spring	With this course, we are aiming the students to gain the ability of analyzing all kinds of genetic changes in DNA and RNA, and to understand the important of protein structure that plays role in function. We are also aiming to give students a basic bioinformatics knowledge on how to use databases and analysis tools. This class will be offered as an elective course to both master and PhD students in every semester.	Doç. Dr. Atıl Bişgin	-
13	Gene and Cell Therapy Gen ve Hücre Tedavisi	7028	7	Clinical Case Studies in Medical Genetics	Spring	Any medical or genetic counseling student, advanced undergraduate, graduate student in genetics or genomics, resident in any field of clinical medicine, practicing physician, or allied medical professional in nursing or physical therapy should find this lecture series to be a thorough but not exhaustive presentation of the fundamentals of human genetics and genomics as applied to health and disease.	Prof. Dr. Salih Şanhoğlu Doç. Dr. Serdar Ceylaner	-
14	Gene and Cell Therapy Gen ve Hücre Tedavisi	8002	7	Development of Pancreatic Islets and R	Spring	Analysis of the development of pancreatic islets, and also growth of the different cell types constituting the islets with special emphasis on beta cells, their relations with human diseases, including a detailed look on the therapeutic potentials of current research approaches.	Prof. Dr. Ahter Dilşad Şanlıoğlu	-

15	Gene and Cell Therapy Gen ve Hücre Tedavisi	8004	7	Clinical Applications of Gene and Cell Therapy	Spring	In cell therapy, there is significant future potential for tissue regeneration and even replacement of damaged tissues with either various types of progenitor cells or even with iPS cells. According to FDA, 10-20 gene and cell therapy products is expected to be approved every year by 2025. This lecture emphasizes the importance of recent clinical trials in gene and cell therapy field.	Prof. Dr. Salih Şanlıoğlu	-
16	Gene and Cell Therapy Gen ve Hücre Tedavisi	8006	7	Cell and Gene Therapy	Spring	The ultimate goal of cell and gene therapy is to provide remedies for all the major obstacles to successful outcomes of HCT. Regulatory T-cell or mesenchymal stromal cell infusions aim to prevent or treat GvHD. Tumor antigen-specific T cells, CAR T cells, α/β TCR T cells, and NK cells can prevent or treat leukemic relapse, and T cells targeting multiple viruses can reduce transplant morbidity and mortality. Finally, gene therapy is being used not only in malignant but also in nonmalignant hematologic disorders.	Prof. Dr. Salih Şanlıoğlu	-
17	Gene and Cell Therapy Gen ve Hücre Tedavisi	8008	7	Good Manufacturing Practice of Biotechnological/Biological Products	Spring	This course aims to provide knowledge about the 'ICH Quality Quidelines' quality requirements of biotechnological/biological medicinal products which are produced according to Good Manufacturing Practice (GMP) rules.	Dr. Öğr. Üyesi Devrim Demir Dora	-
18	Gene and Cell Therapy Gen ve Hücre Tedavisi	8010	7	Cancer Cell and Cancer Stem Cell Biology and Therapeutic Applications	Spring	Different mechanisms contribute to intratumor heterogeneity, including genetic mutations, the microenvironment, and the existence of subpopulations of cancer cells named cancer stem cells (CSCs). Cancer stem cells found in primary tumors are characterized by their increased renewal capacity and the ability to recapitulate the heterogeneity. In this context, the main aim of this course is, besides giving a basic knowledge of cancer cell culture, to increase the knowledge of cancer stem cell biology, and to clarify the mechanisms of stem cell quiescence.	Doç. Dr. A. Yasemin Göksu Erol	-
19	Gene and Cell Therapy Gen ve Hücre Tedavisi	8012	7	Telomers and Telomerase	Spring	All the molecular components of telomeres and telomerase will be described at the level of both structure and function. The course discussions will cover the physiological consequences of telomeric and telomerase dysfunction in various organisms, spanning from yeast to humans. One major emphasis of these discussions will be on the role of telomerase in cancer cell proliferation. The other major emphasis will be on the role of telomerase in aging and premature-aging diseases such as dyskeratosis congenita.	Dr. Öğr. Üyesi Hande Koçak	-
20	Gene and Cell Therapy Gen ve Hücre Tedavisi	8014	7	Clinical Development of Biotechnology-Derived Medicinal Products and Biosimilars	Spring	First human inn studies that must be completed at the clinical stage in the process of development and licensing of medicinal products originating from biotechnology. Design and purposes of Phase I, Phase II, Phase III and Phase V studies after licensing, Methods used in the selection of doses to be applied in transition to the first clinical studies in humans. Clinical studies that need to be completed for different product classifications of biosimilar medicinal products. Product classes differences between requirements. differences in the results of biotechnology products used in the clinical efficacy of biotech products. Indications of biosimilar extrapolation, interchangeable uses of innavator medicinal products, global regulations in this regard. international guidelines for the development of biotechnological medicinal products and biosimilar, information on clinical data requirements in these guidelines.	Prof. Dr. Sadi Özdem	-
21	Gene and Cell Therapy Gen ve Hücre Tedavisi	8016	7	Pluripotent Stem Cells in Research and Therapy	Spring	Stem cell biology, the methods of obtaining stem cells, the stem cells in laboratory conditions will be enlarged according to the type of cell you want will be given detailed information about. In addition to this, the students will be taught the current current used for the genetic modification of the stem cells and will be given about the investigation of the disease mechanisms of stem cells	Dr. Öğr. Üyesi Sevim Kahraman Dirice	-
22	Gene and Cell Therapy Gen ve Hücre Tedavisi	8018	7	Transplantation Immunology	Spring	Today, organ transplantation is commonly used as a lifesaver in the final failure of organs such as kidney, liver, heart and lung. In addition, bone marrow transplantation is common in the treatment of some immunodeficiencies and malignancies, while pancreas, corneal and composite tissue transplantations are widely used to improve the quality of life. The aim of this course is to provide students with an understanding of organ and tissue immunology	Prof. Dr. Sadi Köksoy	-

23	Gene and Cell Therapy Gen ve Hücre Tedavisi	8020	7	Immune Gene and Cell Therapy	Spring	This course focuses on the role of the immune system in diseases and conditions such as cancer, autoimmunity, infectious diseases and regression; different diseases that may benefit from immune-, gen- and cell therapy; and potential immune-, gene- and cell therapy approaches in the treatment of these disease.	Prof. Dr. Barbaros Oral	-
24	Gene and Cell Therapy Gen ve Hücre Tedavisi	8022	6	Genomics in Clinical Sciences	Spring	General overview of the genome structure and organization of different organisms, providing students with detailed knowledge on various different basic and advanced techniques used in DNA manipulation and proteomics approaches, and discussion of the purpose and principles of use of these techniques in genome-based research.	Doç. Dr. Atıl Bişgin	-
25	Gene and Cell Therapy Gen ve Hücre Tedavisi	8024	7	Cancer Biology	Spring	The objective of this course is to explain the basic signaling pathways and genes that are related to the development of cancer. At the end of the course, the students will be able to describe the properties of cell cycle, oncogenes, tumor suppressor genes, tumor viruses, growth factors, receptors and explain angiogenesis, prevention of cancer, targeted drug development in cancer and animal models used for cancer studies. Moreover, they will be able to analyze and interpret the existing literatures related to the lectures critically.	Prof. Dr. Devrim Gözüaçık	-
26	Gene and Cell Therapy Gen ve Hücre Tedavisi	5002	7	Methods and Protocols in CRISPR Gene Editing	Spring	Genetic manipulation tools have been built on top of the CRISPR-Cas9 system, such as CRISPR-based gene activation, gene interference, base editing, DNA methylation, and histone acetylation. Among all the already harnessed CRISPR-Cas systems utilized for gene editing, the CRISPR-Cas9 system is still the most extensively developed and broadly used one. This lecture is intended to assist graduates, and researchers with detailed guidelines and methods for the CRISPR gene editing field.	Prof. Dr. Salih Şanhoğlu	-
27	, Gene and Cell Therapy Gen ve Hücre Tedavisi	5004	7	Gene Therapy Vectors: Protocols	Spring	Gene therapy, on a basic level, is defined as the delivery of nucleic acids to a cell in order to produce a desired effect. There are many methods that can be utilized in order to deliver nucleic acids to cells; however, the most efficient and adaptable method is the use of viral vectors. Viruses have naturally evolved over millennia to develop elegant mechanisms used to evade host immunity, gain entry to a cell, deliver their genetic material, and hijack host cell machinery in order to produce progeny virions. Viral vectors-based gene therapy harnesses this awesome power of nature in order to efficiently deliver a desired genetic payload to cells of interest. The fundamental concept of a viral vector is relatively simple. First, the genes from the viral genome that are responsible for viral replication or untoward host response (i.e., disease) are removed, leaving only the genetic information that is absolutely essential for viral assembly. Next, the desired genetic payload is inserted into the modified viral genome. Finally, the resulting recombinant viral vector, containing the desired genetic material, is assembled in cultured cells and purified. This compilation of protocols is expected to serve as a valuable resource for graduate students, as well as for basic and clinical researchers in the industry and academia.	Prof. Dr. Salih Şanhoğlu	-
28	Gene and Cell Therapy Gen ve Hücre Tedavisi	5006	7	Animal Models of Diabetes	Spring	The main purpose of this course is to introduce researchers to the animal model of diabetes for both studing molecular pathogenesis of diabetes and the testing of the therapeutic efficacy of novel compounds.	Prof. Dr. Salih Şanhoğlu	-
29	Gene and Cell Therapy Gen ve Hücre Tedavisi	5008	7	Scientific Article Writing Techniques	Spring	In this course, the structure of scientific articles used and prepared in Health Sciences education and research is introduced to graduate students, and the main rules of scientific article preparation are taught. Scientific article types and parts are handled one by one, students are provided to apply what they have learned and are evaluated. Good and bad examples of the topics covered will be presented to the students in relation to the field of Medical Biology and other fields.	Prof. Dr. Ahter Dilşad Şanlıoğlu	-
30	Gene and Cell Therapy Gen ve Hücre Tedavisi	5010	7	Gene Manipulation and Genomics Applications	Spring	General overview of the genome structure and organization of human genome and genomes of various different microorganisms, providing students with detailed knowledge on various different basic and advanced techniques used in DNA manipulation and proteomics approaches, and discussion of the purpose and principles of use of these techniques in genome-based research.	Prof. Dr. Ahter Dilşad Şanlıoğlu	-

31	Gene and Cell Therapy Gen ve Hiicre Tedavisi	5014	7	In Vitro Fertilization Procedures and Fertillity Preservation Methods	Spring	In this course, both basic knowledge of assisted reproductive techniques and andrology laboratory techniques are involved. This course also provides the discussion of cryopreservation methods for fertility preservation and the challenges of their applications.	Doç. Dr. A. Yasemin Göksu Erol	-
32	Gene and Cell Therapy <i>Gen ve Hiicre Tedavisi</i>	5016	7	Human Fetal Growth and Development	Spring	The fetal period (Weeks 9 - 38), is a time of extensive growth and differentiation of organ primordia established in the embryonic period. This course will cover the key events of human development during the fetal period and abnormal fetal development, as well.	Doç. Dr. A. Yasemin Göksu Erol	-
33	Gene and Cell Therapy <i>Gen ve Hiicre Tedavisi</i>	5018	6	Molecular Basis of Diseases	Spring	This course aims to cover the different molecular mechanisms underlying the pathologies of different diseases. The discussion will start from the specific mechanisms of mutagenesis and related phenotypes and will continue with the molecular mechanisms of various diseases including mitochondrial diseases, prion diseases and epigenetic-related diseases, telomere biology disorders and trinucleotide repetitive disorders. The final part of the course will focus on the molecular genetics of cancer.	Dr. Öğr. Üyesi Hande Koçak	-
34	Gene and Cell Therapy Gen ve Hiicre Tedavisi	5020	6	Advanced Human Molecular Genetics	Spring	The role and importance of molecular genetic applications in human health is tried to be given in this course. The role of genes in the emergence of human diseases, the role of susceptibility to diseases is explained. In this context, topics such as genetic tests, personalized medicine, pharmacogenetics and population screening are discussed. In addition, the mechanism of human diseases using genetically modified animals, how to use genes in the treatment of diseases are the subjects of this course.	Dr. Öğr. Üyesi Ersin Akıncı	-
35	Gene and Cell Therapy Gen ve Hiicre Tedavisi	5022	7	Ion Channels	Spring	Hodgkin-Huxley Model, Basic Properties of Pores, Diffusion and Behaviour of Ions in solution, The structures of ion channels, Ion selectivity, Voltage-gated ion channels, Extracellular ligand gated ion channels, Mechanosensitive and cell volume-regulated ion channels, other ion channels	Prof. Dr. Semir Özdemir	-
36	Gene and Cell Therapy Gen ve Hiicre Tedavisi	5024	6	Genetic Counseling and Ethics in Health Sciences	Spring	With this course, we are aiming the students to have basic knowledge about molecular genetics in clinical use and to understand the disease basics at molecular level by teaching the gene structure and human development. In addition, we are also aiming the student to have have basic knowledge about medicolegal issues and to be able to give genetic counseling. This class will be offered as an elective course to both master and PhD students in every semester.	Doç. Dr. Atıl Bişgin	-
37	Gene and Cell Therapy Gen ve Hiicre Tedavisi	5032	7	Biochemistry of gene expression	Spring	This course covers various aspects of gene expression from a molecular genetic and biochemical perspectives. The topics covered include: genome and gene structure, the processes of transcription and translation in prokaryotes and eukaryotes, the structures and functions of RNA polymerase and the ribosome, structures of gene promoters, and a detailed mechanistic examination of how gene expression is regulated in the cell.	Dr. Öğr. Üyesi Reha Onur Azizoğlu	-