

ISTINYE UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL BIOLOGY AND GENETICS (THESIS)
COURSE DESCRIPTIONS

1st SEMESTER

Genome And its Molecular Structure | 3 ECTS

Mapping and sequencing of genomes; history and structure of genomic diversity, genomic approaches to human diversity and diseases; genomic softwares, introduction to system biology.

Mendelian And Non Mendelian Inheritance Types | 2 ECTS

Monohybrid, dihybrid and trihybrid inheritance, Cell division (mitosis, meiosis) Extensions of Mendelian inheritance, incomplete dominance, codominance, multiple alleles and heredity of blood groups, lethal genes, epistasis, linkage and mapping, non-nuclear inheritance, sex chromosomes, sex-linked inheritance and non-Mendelian inheritance.

Molecular Techniques And Application Areas | 3 ECTS

Light and electron microscopy, spectroscopic techniques in biology, circular dichroism, the principles of chromatography, protein purification using chromatographic techniques, electrophoretic methods, identification of proteins and nucleic acids by electrophoresis, radioactive labelling methods, membrane filtration and dialysis techniques, centrifugation methods, PCR, nucleic acid sequencing methods.

Mutation and mutation screening methods | 5 ECTS

Mutations and mutation types, chromosomes and gene mutations, chemical mutagens, physical mutagens, mutations and dose relationships, mutagenesis, mutations and cancer, mutagenicity test types, chromosomal aberration, SOS Chromo Test, Ames test, Comet Assay, SCE, micronucleus test, Allium Test.

Seminar | 5 ECTS

Oral presentation

Master Of Science Thesis Advisory-1 | 2 ECTS

Guiding the thesis of the graduate student, providing the student with the knowledge, skills and attitude about the thesis project.

Master of Science Specialized Field Course-1 | 5 ECTS

Investigation on study fields and developments on these study fields of all students, under the supervision of an advisor, who are progressing their M.Sc. thesis.

Microorganism Genetics | 5 ECTS

Genetic structure and system in prokaryotes, extrachromosomal genetic materials (plasmids, transposons, episomes), DNA replication, gene expression and regulation of gene expression, mutations, transformation of genetic material, transduction and transfection by conjugation, bacterial global communication mechanisms, yeast genetics, virus genetics.

Karyotype Writing Rules | 5 ECTS

Learning the ability to read, write and interpret normal and pathological karyotype. To learn normal and pathological karyotype writing according to ISCN rules.

2nd SEMESTER

Tissue And Cell Culture | 3 ECTS

Tissue culture, cell culture laboratory and equipment, safety rules, applications in human cells.

Molecular Basis Of Diseases | 2 ECTS

Bond structures of organic molecules, structure and functions of basic biological molecules, structural metabolic processes and their relation to cell physiology while evaluating structural information in terms of molecular evolution and molecular foundations of structural and metabolic changes under pathophysiological conditions.

Epigenetics | 3 ECTS

Definition of epigenetics, regulation of gene expression, histone code hypothesis and histone modifications, DNA methylation, X-inactivation and the role of epigenetic modifications in diseases.

Ethics Of Scientific Writing And Publication | 5 ECTS

Scientific research and scientific research processes, methodology, subject determination, defining the problem, purpose, importance, limitations. Data collection processes and analysis methods, types of scientific publications, unethical behaviors and ethical violations during research, legal regulations.

Master of Science Thesis Advisory-2 | 2 ECTS

Guiding the thesis of the graduate student, providing the student with the knowledge, skills and attitude about the thesis project.

Master of Science Specialized Field Course-2 | 5 ECTS

Investigation on study fields and developments on these study fields of all students, under the supervision of an advisor, who are progressing their M.Sc. thesis.

Molecular Immunology | 5 ECTS

Key ligands of immune system elements, natural killer cells, dendritic cells, receptors of T and B cells, expressions of co-stimulants, steps of protein processing, B lymphocyte cloning, in vitro immune system cultures, intracellular cytokine staining, immunological ELISA methods and their use, autoimmune system in animal models.

Non Coding Regions In Genome | 5 ECTS

Interactions and functions of non-coding regions with gene structure. Repetitive regions in the genome, their place, importance and functions. Satellites and telomer DNA. Transposons and genome organization.

3rd SEMESTER

Master Of Science Thesis Advisory-3 | 5 ECTS

Guiding the thesis of the graduate student, providing the student with the knowledge, skills and attitude about the thesis project.

Master of Science Specialized Field Course-3 | 5 ECTS

Investigation on study fields and developments on these study fields of all students, under the supervision of an advisor, who are progressing their M.Sc. thesis.

Thesis Project | 20 ECTS

4th SEMESTER

Master Of Science Thesis Advisory-4 | 5 ECTS

Guiding the thesis of the graduate student, providing the student with the knowledge, skills and attitude about the thesis project.

Master of Science Specialized Field Course-4 | 5 ECTS

Investigation on study fields and developments on these study fields of all students, under the supervision of an advisor, who are progressing their M.Sc. thesis.

Thesis Project | 20 ECTS