4.2 Programme learning outcomes:

Aims

1. To cultivate molecular biologists, researchers, and scientists who possess the competence to advance their acquired knowledge in molecular biology and genetics in both disciplinary and interdisciplinary areas of specialisation such as genetics, genomics and developmental biology, medical biology and genetics, biotechnology, synthetic biology and bioinformatics and, who are thereby equipped with the ability to lay the foundations for future technologies and to utilise them effectively.
2. To enhance students' awareness of social responsibility and commitment to the common good by equipping them with the ability to act responsibly in ways that promote environmental awareness, sustainability, accessibility, inclusivity, and well-being, as well as fostering their critical thinking and ethical decision-making skills.
3. To develop and implement innovative educational approaches that meet current scientific and societal challenges, broaden students' career prospects and scientific proficiency, and promote interdisciplinary interaction and specialization.
4. To build stronger links between the university and industry that enable students to develop problem-solving, entrepreneurial, and lifelong learning skills, strengthen their theoretical knowledge through practice, and enhance their employability.
5. To actively integrate artificial intelligence and technological solutions into education and research, continuously enhance digitalisation initiatives, and consequently apply teaching, learning, and assessment methods that address current demands.
6. To increase the Department's international recognition and facilitate the exchange of knowledge and experience among faculty and students at national and global levels through national and international academic exchange programmes, collaborative projects, and dual degree opportunities.

Objectives

The objective of this programme is to cultivate molecular biologists, researchers, and scientists who

- Possess a strong foundation of knowledge to conduct advanced-level studies in the field of molecular biology and genetics; have internalised scientific thinking; and are capable of formulating solution methods for theoretical or applied problems by employing their scientific thinking skills,
- Act responsibly in ways that promote environmental awareness, sustainability, accessibility, inclusivity and well-being and who have acquired skills in critical thinking, entrepreneurship, problem solving, ethical decision-making, and lifelong learning,
- Have the skills of using and developing current artificial intelligence and information technologies and the competence to advance their acquired knowledge in molecular biology and genetics in both disciplinary and interdisciplinary areas of specialisation such as genetics, genomics and developmental biology, medical biology and genetics, biotechnology, synthetic biology and bioinformatics,
- Are able to use molecular biology and genetics terminology in both Turkish and English, conduct field-related research, collaborate in team-based settings, and effectively present their work,
- Have the competence to work in managerial, research, and applied roles in national and international institutions in both the public and private sectors as individuals with the ability to

define their career goals and manage their professional development and who are committed to professional ethical values.

Programme Learning Outcomes

Upon successful completion of the programme, students will be able to

PO-1) Comprehend the fundamental structures and processes in the field of molecular biology and genetics, analyse the functioning of biological systems, cells and genes at the cellular and molecular levels, design experiments, apply laboratory techniques; evaluate the obtained data and interpret the results.

PO-2) Select appropriate methods for identifying, interpreting and solving problems in the life sciences employing the fundamental concepts, principles and theories of molecular biology and genetics.

PO-3) Understand and interpret phenomena, processes, equipment or products, identify problems; select and apply appropriate scientific methods for solutions and effectively use statistical methods and bioinformatics tools to analyse experimental data using their knowledge of molecular biology and genetics.

PO-4) Synthesise knowledge acquired from different disciplines through an interdisciplinary approach.

PO-5) Advance their acquired knowledge in molecular biology and genetics in both disciplinary and interdisciplinary areas of specialisation such as genetics, genomics and developmental biology, medical biology and genetics, biotechnology, synthetic biology and bioinformatics.

PO-6) Use at least one programming language and computer and artificial intelligence technologies widely employed in molecular biology and genetics for problem-solving, data analysis, and simulations.

PO-7) Follow scientific and technological developments in molecular biology and genetics and related fields, assess career opportunities, identify personal and professional development goals, and adopt lifelong learning strategies to achieve these goals.

PO-8) Act with a sense of social responsibility and justice and in accordance with professional ethical principles, quality standards, and universal values by taking into account potential legal and societal consequences of their scientific research and professional activities.

PO-9) Work effectively both independently and as part of a team.

PO-10) Access reliable sources of information, conduct literature reviews, and design and carry out academic research in the field of molecular biology and genetics.

PO-11) Effectively communicate topics, research, and problem solutions in the field of molecular biology and genetics to all relevant stakeholders using appropriate molecular biology and genetics terminology, both orally and in writing, in Turkish and in English.

Occupational Profile of Graduates

Graduates of the Bachelor Programme in Molecular Biology and Genetics possess a solid foundation of knowledge in molecular biology and genetics, with the ability to evaluate biological systems from a multi-layered and holistic perspective. They have developed competencies in generating creative and analytical solutions to problems, adapting to rapidly evolving scientific and technological advancements, and are open to interdisciplinary and transdisciplinary collaborations. Equipped with a solution-oriented mindset and a research culture, they are prepared for employment across a variety of sectors.

Graduates may pursue academic careers by continuing their studies in master's and doctoral programmes in molecular biology, genetics, biotechnology, medical biology, and related fields

and may contribute to research and development activities in universities, research institutes, hospitals, genetic diagnostic centres, biotechnology firms, and pharmaceutical companies.
In addition to the high-quality discipline-specific education they receive:
Graduates who have completed the “Biotechnology Certificate Programme” may work in product development, production, and quality control units within the biotechnology and pharmaceutical industries, as well as in the fields of bioprocess engineering and industrial biotechnology, and in R&D institutions focusing on biosensor technologies.
Graduates who have completed the “Genetics, Genomics and Developmental Biology Certificate Programme” may work in universities, public research institutes, genetic diagnostic centres, and public and private sector educational and R&D institutions.
Graduates who have completed the “Medical Biology and Genetics Certificate Programme” may work in genetic diagnostic centres, hospitals, molecular testing laboratories, clinical research organisations, and institutions involved in pharmacogenetic-based drug development.
Graduates who have completed the “Data Science Certificate Programme” or the “Statistics in Health Sciences Certificate Programme” may work in organisations requiring biological data analysis, including those within environmental and healthcare services.

Graduation Requirements
The Bachelor’s Degree is awarded to students who have successfully completed all courses in the curriculum, and have obtained accumulative grade point average of at least 2.0 on scale 2.0-4.0.