AGU Graduate School of Engineering & Science
Bioengineering M.Sc. Program

Program Records

About the Program	Bioengineering is an interdisciplinary field that applies the engineering principles to biological systems by integrating biology and medicine with engineering to address challenges and solve problems related to living systems. It aims to understand, modify, or control medical systems by integrating medicine and biology with engineering. This field not only creates knowledge and develops innovative approaches but also help in the prevention, diagnosis, and treatment of diseases, and designs products that provide traceability of physiological functions. It is an interdisciplinary field that applies basic life sciences and engineering principles, methodologies and concepts to life and living systems through laboratory research, aiming to extend human lifespan and improve quality of life. Bioengineering encompasses a wide range of subfields, each with specific applications and goals. For example, in the biomaterials, tissue engineering and regenerative medicine, bioengineering focuses on creating materials or devices to replace or improve functions of tissues or organs in human body. This includes the development of synthetic tissues and organs that can restore lost functions. In the bioinstrumentation area, it deals with design and development of devices and systems for disease diagnosis and monitoring. This includes the creation of advanced biosensors and diagnostic chips, often utilizing nanotechnology and biomimetic approaches to improve sensitivity and specificity. Another branch of bioengineering is drug delivery technology, which involves the development of controlled release systems and smart nanocarriers, especially for the diagnosis and treatment of life-threatening diseases. This technology ensures that therapeutic agents are delivered effectively to specific sites in the body, maximizing efficacy and minimizing side effects. Bioengineering also plays a crucial role in the biosynthesis of animal and plant products, utilizing biological processes to produce valuable compounds. Additionally, the field encompasses cellular and molecular engineering, focusing on recombinant DNA technology, food safety, and the development of new biotechnological products with high added value. Moreover, bioinformatics is another subfield of bioengineering, based on new developments in data science to analyze and interpret complex biological data. This area supports the development of personalized medicine, genomics, and other cutting-edge applications. Altogether, bioengineering field of study focuses on the advancement and development of tools, materials, systems, and devices for use in the biological sciences and medicine. Overall, bioengineering graduate program provides a comprehensive education that blends fundamental life sciences with advanced engineering techniques, where the students are equipped to make significant contributions to healthcare and biotechnology.
Program Objectives	Providing original and innovative solutions for local and global problems through interdisciplinary education and research experience gained from basic sciences and engineering fields. Taking part in research and development projects in national and international organizations. Undertaking the design, production and control of the products, as a researcher and entrepreneur.
Qualification Awarded	Master of Science (M.Sc.) Degree / M.Sc. in Bioengineering
Length of Program & Credits	2 years & 120 ECTS
Level of Qualification	Second Cycle (Master of Science) Degree; QF-EHEA: Level 2, EQF-LLL: Level 7
Mode of Study	Full Time
Field of Study	Natural Science, Engineering-Life Science

Admission Requirements	Bachelor's degree diploma; a passing or acceptable score from the English Proficiency Exam of Abdullah Gul University, YDS (Foreign Language Exam), YÖKDİL (Foreign Language Exam for Higher Education Institutions), or TOEFL; an acceptable score from the Academic Personnel and Postgraduate Education Entrance Exam (ALES - Mathematical Score Type) min 70; a passing score at the oral interview for the concerned Master's program. International students are admitted based on the criteria posted by the university.
Recognition of Credit Mobility	Course substitutions, medium of instruction of a previous course must be English, its final grade must be at least 3.00 out of 4.00 and approval of a relevant University Board is required. Lateral Transfer: Spending at least one semester at the master's program currently enrolled in, taking at least 2 credit courses and passing them with at least 3.00 out of 4.00
Graduation Requirements & Regulations	Successful completion of 1 Introduction to Scientific Research Methods and Scientific Publication Ethics course, 1 compulsory course, 6 Elective courses (at least half of these elective courses must be BENG5XX coded) and a Seminar course; a minimum grade point average (GPA) of 3.00; earning 120 ECTS credits; successful submission and defence of a thesis and fulfil the publication requirements* for graduation from MSc Program. * Publication requirements for graduation from MSc Program At least one (1) national or international poster/oral presentation.
Occupational Profiles of Graduates	Bioengineers can be employed in the industrial fields such as health care, medical devices, and drug research in different departments such as research and development, quality control and marketing besides academic career in universities.
Access to Further Studies	Graduates may apply to PhD programs.
Assessment & Grading Policy	Based on Abdullah Gul University Graduate Education and Examination Regulation rules.

Letter Grade	Coefficient	Score	Status
A	4,00	90-100	Pass
A-	3,67	87-89	Pass
B+	3,33	83-86	Pass
B	3,00	80-82	Pass
B-	2,67	77-79	Pass
C+	2,33	73-76	Pass
C	2,00	70-72	Failed
C-	1,67	64-69	Failed
D+	1,33	56-63	Failed
D	1,00	50-55	Failed
F	0,00	0-49	Failed

Information letters	Explanation
NA	Not Attended
W	Withdrawn
I	Incomplete
T	Transferred
S	Satisfactory
U	Unsatisfactory
P	In Progress
EX	Exempt

Program Outcomes	PO1.	Apply knowledge of mathematics, science and engineering.
	PO2.	Ability to have scientific and ethical values.
	PO3.	Solve unexpected and encountered problems in related applications.

PO4. Plan activities required for professional development and critically evaluate the accuracy and relevancy of knowledge and skills acquired.

PO5. Share opinions or solution offers to the problems to specialists or non-specialists by supporting these with qualitative and quantitative data.

PO6. Have competency in a foreign language to follow the literature in bioengineering and communicate with their peers.

PO7. Use computer software and communication and information technologies required in the field of bioengineering competently to access scientific resources.

PO8. Comply with social, scientific and ethical values in the process of collecting, interpreting and using data for reporting the results in the field of bioengineering.

PO9. Awareness of the environmental protection and work/laboratory safety.

PO10. Have the skills to work in interdisciplinary subjects.

PO11. Solve complex engineering problems by having skills to use modern devices required for the practices.

PO12. Have competency in keeping up with global innovations and developments in bioengineering and in related fields.

TQF-HE & Program Outcomes Coverage

	Knowledge	**Skills**	**Competences**			
	Theoretical Conceptual	Cognitive Practical	Work Independently and Take Responsibility	Learning	Communication and Social	Field Specific
PO1	X		X	X		
PO2					X	
PO3	X		X			
PO4					X	X
PO5				X	X	
PO6		X	X			X
PO7	X	X		X		X
PO8					X	
PO9			X		X	
PO10	X	X	X			
PO11	X	X	X	X		
PO12		X		X		X

Institutional & Program Outcomes (IOs) Coverage *

	IO1	IO2	IO3	IO4	IO5	IO6	IO7
P01	X						
PO2	X	X					
PO3	X				X		
PO4	X				X		X
PO5					X		
PO6					X	X	X
PO7			X	X			
PO8			X				X
PO9	X				X		
PO10	X				X		
PO11	X				X		
PO12		X					

* Link for the AGU Institutional Student Learning Outcomes (IOs)
https://cat.agu.edu.tr/Pages/KurumsalOgrencmeCiktilari.aspx?lang=en-US

Curriculum

Sem.	Code	Course	T	P	C	ECTS
1st	BENG550	Bioengineering A Conceptual Approach	3	0	3	7,5
	GCC1001	Introduction to Scientific Research Methods and Scientific Publication Ethics	3	0	3	7,5
	BENG5XX	MSc Elective	3	0	3	7,5
	BENG5XX	MSc Elective	3	0	3	7,5
		semester credits	**12**	**0**	**12**	**30**
2nd	BENG5XX	MSc Elective	3	0	3	7,5
	XXX XXX	Elective	3	0	3	7,5
	XXX XXX	Elective	3	0	3	7,5
	XXX XXX	Elective	3	0	3	7,5
		semester credits	**12**	**0**	**12**	**30**
3rd to 4th	BENG500	Seminar	0	2	0	5
	BENG597	MSc Special Topics	4	0	0	10
	BENG599	MSc Thesis	0	1	0	45
		semester credits	**4**	**3**	**0**	**60**
		TOTAL	**28**	**3**	**24**	**120**

Curriculum Summary

%		Courses	Credit	ECTS
6,25	**YÖK/HEC Courses** GCC1001 *	1	3	7,5
6,25	**Compulsory Courses** BENG550	1	3	7,5
37,5	**Electives Courses *** BENG5XX, XXX XXX (BENG6XX and other graduate programs)	6	18	45
4,2	**Seminar** BENG500	1	0	5
8,3	**MSc Special Topics** BENG597	1	0	10
37,5	**MSc Thesis** BENG599	1	0	45
100,0	**TOTAL**	**11**	**24**	**120**

***** At least half of them must be taken from the BENG program; other elective courses can be taken with the same ECTS from other graduate programs.
The semester in which the courses will be offered is under the authority of the Program Executive Board.