

**ASIIN Seal** 

## **Accreditation Report**

Bachelor's Degree programme Molecular Biology and Genetics

Master's Degree Programme Medical Biotechnology

Provided by Eastern Mediterranean University, North Cyprus

Version: 23 June 2023

## **Table of Content**

Α	About the Accreditation Process	3
В	Characteristics of the Degree Programmes	5
С	Peer Report for the ASIIN Seal	7
	1. The Degree Programme: Concept, content & implementation	7
	2. The degree programme: structures, methods and implementation	. 14
	3. Exams: System, concept and organisation	. 22
	4. Resources	. 24
	5. Transparency and documentation	. 28
	6. Quality management: quality assessment and development	. 30
D	Additional Documents	.33
E	Comment of the Higher Education Institution (09.11.2021)	.34
F	Summary: Peer recommendations (15.11.2021)	.44
G	Comment of the Technical Committees (22.11.2021)	.46
	Technical Committee 10 – Life Sciences (19.11.2021)	46
	Technical Committee 14 – Medicine (22.11.2021)	. 46
н	Decision of the Accreditation Commission (07.12.2021)	.48
I	Fulfilment of Requirements (09.12.2022)	.51
	Analysis of the peers and the Technical Committees (02.12.2022)	. 51
	Decision of the Accreditation Commission (09.12.2022)	. 54
J	Fulfilment of Requirements (23.06.2023)	.55
	Analysis of the peers and the Technical Committees (12.06.2023)	. 55
	Decision of the Accreditation Commission (23.06.2023)	. 56
A	opendix: Programme Learning Outcomes and Curricula	.57

## **A** About the Accreditation Process

Name of the degree	ame of the degree (Official) English trans- Labels ap- Previous			Involved
programme (in origi-	lation of the name	plied for <sup>1</sup>	accredita-	Technical
nai language)			tion (issu-	Commit-
			ing agency,	tees (TC) <sup>2</sup>
			validity)	
Bachelor's pro-	Bachleor's programme	ASIIN	AHPGS un-	10, 14
gramme Molecular	Molecular Biology and		til	
Biology and Genetics	Genetics		30.09.2020	
Master's programme	Master's programme	ASIIN	-	10, 14
Medical	Medical Biotechnology			
Biotechnology				
Date of the contract: 2	25.09.2020			
Submission of the fina	l version of the self-asses	sment report	: 29.06.2021	
Date of the audit: 20.0	09. – 24.09.2021			
at: Eastern Mediterrai	nean University, Famagus	ta, North Cyr	orus	
Peer panel:				
Dr. Regina Holzhauser,	, St. Ingbert			
Prof. Dr. Hans-Martin	Jäck, University of Erlange	n-Nürnberg		
Prof. Dr. Hans-Jörg Jac	obsen, University of Hann	over		
Prof. Dr. Markus Schna	are, University of Marburg			
Osman Yetkin, M.Sc., PhD student, Near East University				
Representative of the				
Rainer Arnold				
Responsible decision-				
Accreditation Commission for Degree Programmes				

<sup>&</sup>lt;sup>1</sup> ASIIN Seal for degree programmes;

<sup>&</sup>lt;sup>2</sup> TC: Technical Committee for the following subject areas: TC 10 – Life Sciences, TC 14 - Medicine

#### Criteria used:

European Standards and Guidelines as of 15.05.2015

ASIIN General Criteria as of 28.03.2014

Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019

## **B** Characteristics of the Degree Programmes

a) Name	Final degree (origi- nal/English trans- lation)	b) Areas of Specialization	c) Corre- sponding level of the EQF <sup>3</sup>	d) Mode of Study	e) Dou- ble/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor's pro- gramme Molecu- lar Biology and Genetics	Bachelor of Science	-	6	full time, part time	no	8 Semester	139 EMU CP (credit points) 240 ECTS	Fall + Spring Se- mester, 2011
Master's programme Medical Biotechnology	Master of Science	-	7	full time, part time	no	2 Semester	30 EMU CP (credit points) 60 ECTS	Fall + Spring Se- mester, 2019

<sup>&</sup>lt;sup>3</sup> EQF = The European Qualifications Framework for lifelong learning

For the <u>Bachelor's degree programme Biology and Genetics</u>, Eastern Mediterranean University (EMU) has presented the following profile on its webpage:

"Molecular Biology and Genetics program at EMU offers a Bachelor of Science degree upon completion of a 4-year curriculum taught in English. Students are mainly educated in molecular biology and various fields of genetics. In addition, courses include other fields of biology such as immunology and neuroscience. Well-rounded education is achieved by courses in mathematics, physics, chemistry, computer science and other fields embedded in the curriculum. In the first year, students are introduced to fundamentals of biological sciences in general and molecular biology in particular. Following, specialized courses provide in-depth knowledge in various aspects of genetics and molecular biology, both in theory and in practice through laboratory experience. Students are also offered several elective options in order to further develop themselves according to their own interests, such as in fields of nutrigenomics and genetic epidemiology."

For the <u>Master's degree programme Medical Biotechnology</u>, Eastern Mediterranean University (EMU) has presented the following profile on its webpage:

"Medical Biotechnology program offers a well-rounded curriculum. Molecular Biology and Genetics, and Fundamentals of Biotechnology are the compulsory courses of the program. For the successful completion of the program, a term project is also necessary. In addition, students will take 8 different elective courses. Wide range of elective courses provides students to expand their horizons in their specific areas of interest. Such courses include Genome Editing and Gene Therapy; Medical Biotechnology in Diagnostics and Therapeutics; Biomarkers and Drug Development; Applications of Biotechnology in Assisted Reproduction and Vaccines and Immunity."

## **C** Peer Report for the ASIIN Seal

## 1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

#### Evidence:

- Objectives-Module-Matrix
- Self-Assessment Report
- Study plans
- Module descriptions
- Webpage Eastern Mediterranean University: https://www.emu.edu.tr/en
- Webpage Department of Biological Sciences: https://etseq2.urv.cat/etseq/en/15-ensenyaments.html
- Webpage Ba Molecular Biology and Genetics: https://www.emu.edu.tr/en/programs/molecular-biology-and-genetics-undergraduate-program/891
- Webpage Ma Medical Biotechnology: https://www.emu.edu.tr/en/programs/medical-biotechnology-masters-program-without-thesis/1570

#### Preliminary assessment and analysis of the peers:

The peers refer to the Subject-Specific Criteria (SSC) of the Technical Committee Life Sciences as a basis for judging whether the intended learning outcomes of the <u>Bachelor's degree programme Molecular Biology and Genetics</u> and the <u>Master's degree programme</u> <u>Medical Biotechnology</u> as defined by EMU correspond with the competences as outlined by the SSC. As a result, they come to the following conclusions:

Graduates of the <u>Bachelor's degree programme Molecular Biology and Genetics</u> should understand the fundamental biological process and be capable of applying the scientific and technological methods of the biological sciences. In addition, graduates should acquire relevant scientific knowledge in the different biological areas such as molecular biology, biochemistry, biostatistics, molecular biology, cell biology, microbiology, and related natural sciences (chemistry, physics, and mathematics). Furthermore, students learn about the molecular basis of modern genetics, like structure and function of DNA and RNA, gene expression and regulation, and protein synthesis. Moreover, students should acquire the ability to work practically in a laboratory and to apply biological lab equipment and methods.

Finally, graduates of the <u>Bachelor's degree programme Molecular Biology and Genetics</u> should have adequate competencies in oral and written communication skills, be adaptive to the development of biological sciences, and have adequate English proficiency as well as a social and academic attitude.

The programme educational objectives and learning outcomes are expected to equip the graduates with life skills required to develop and adapt to the broad spectrum of possible occupations. Graduates have the opportunity to find employment in a various fields including teaching, clinical genetics, bioinformatics, pharmaceutical and biotechnology companies, diagnostic laboratories, and research institutes. However, the job perspectives in North Cyprus are very limited because there are only a few biotech or pharmaceutical companies. One possibility is to work in a Covid testing centre; another is to work as a teacher in a private school. After additional training in education, they can also become high school teachers in public schools in Turkey or North Cyprus. Due to the relatively poor job opportunities in North Cyprus, most graduates of the Bachelor's programme join a Master's programme, either abroad or in North Cyprus.

The intended learning outcomes of the <u>Master's degree programme Medical Biotechnol-ogy</u> include acquiring advanced theoretical and practical skills in areas such as human genome and gene expression, genomics and proteins, DNA technology, epigenetics, bi-omarkers, and drug development. Graduates should be able to understand and apply diagnostic and therapeutic methods and tools of medical biotechnology and discuss eth-ical, legal and social issues relevant to the field of medical biotechnology.

Based on the Self-Assessment Report and the discussions during the online audit, the peers see that graduates of the <u>Master's degree programme Medical Biotechnology</u> acquire the necessary subject-related competencies. In addition, they have advanced their knowledge in areas such as diagnostic, therapeutics, and drug development.

Furthermore, graduates should be able to solve subject-relevant problems and present the results, have trained their analytical and logical abilities, and be aware of possible social, ethical, and environmental effects of their actions. During their studies, students have also acquired the necessary social competences, such as the ability to work in a team, present and discuss results, and communicate with other experts.

With the increasing importance of Biomedical Sciences and Health Sciences to society in various fields, graduates of the <u>Master's degree programme Medical Biotechnology</u> have a

wide range of career opportunities. These include but are not limited to positions in the biotechnology sector, diagnostic and molecular laboratories, and pharmaceutical companies. However, the job perspectives in North Cyprus are minimal. There are only a few companies in the local biotechnology sector, and currently, these companies mainly concentrate on conducting and analysing Covid-19 tests. Consequently, most graduates either stay at a university or try to pursue an academic career, or they have to go to Turkey or other countries (mainly in Europe) to find adequate jobs.

In summary, the auditors are convinced that the intended qualification profiles of both programmes under review allow graduates to take up an occupation, which corresponds with their qualification. The degree programmes are designed in such a way that they meet the goals set for them. The peers conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification (EQF 6 for the Bachelor's programme, and EQF 7 for the Master's programme); both programmes also correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences. However, in both programs, students need to conduct a research-oriented laboratory project in biomedical sciences.

#### Criterion 1.2 Name of the degree programme

#### Evidence:

• Self-Assessment Report

#### Preliminary assessment and analysis of the peers:

The auditors believe that the English names of both degree programmes correspond with the intended aims and learning outcomes and the primary course language (English).

#### **Criterion 1.3 Curriculum**

#### Evidence:

- Objectives-Module-Matrix
- Self-Assessment Report
- Study plans
- Module descriptions
- Webpage Department of Biological Sciences: https://etseq2.urv.cat/etseq/en/15-ensenyaments.html

- Webpage Ba Molecular Biology and Genetics: https://www.emu.edu.tr/en/programs/molecular-biology-and-genetics-undergraduate-program/891
- Webpage Ma Medical Biotechnology: https://www.emu.edu.tr/en/programs/medical-biotechnology-masters-program-without-thesis/1570

#### Preliminary assessment and analysis of the peers:

The <u>Bachelor's degree programme Molecular Biology and Genetics</u> as well as <u>the Master's</u> <u>degree programme Medical Biotechnology</u> are both offered by the Department of Biological Sciences, which is part of the Faculty of Arts and Sciences of EMU.

Both degree programmes are taught in English. However, there is one exception, HIST280 History of Turkish Reforms. This history course in the Bachelor's programme is compulsory only for Turkish-speaking students and is taught in Turkish. International students instead take TUSL181 Communication in Turkish.

The <u>Bachelor's degree programme Molecular Biology and Genetics</u> is designed for four years and at least 139 EMU credit points (CP) need to be achieved by the students (this is equivalent to 240 ECTS points).

The courses in the first two semesters convey basic knowledge of biology, chemistry, mathematics, and languages (Turkish and English). The focus is on courses in physics, computer sciences, organic chemistry, genetics, and molecular cell biology in the third and fourth semesters. In addition, courses on the different subject-specific sciences such as biostatistics, biochemistry, bioinformatics, microbiology, developmental biology, genomics and proteomics, genetics, bioethics, systems biology, and immunology are offered from the fifth to the eighth semester. These are all compulsory courses amounting to 210 ECTS points. In addition, students, starting with the fifth semester, can choose different electives, which total 30 ECTS points.

The peers point out that the program lacks a graduation paper or research project required at the end of the Bachelor's programme. However, they consider a Bachelor's thesis an essential part of academic studies because it demonstrates the students' ability to conduct a research project and to summarise and present the results. This should include the formulation of a research hypothesis, the design of a research project, literature research, practical laboratory work, and a written report, including a discussion of the results in view of the relevant corresponding literature. In addition, the Bachelor's thesis serves as an effective tool to measure the academic level of theoretical and practical competencies obtained by a soon-to-be graduate. At the same time, it prepares students for master's degree studies, where scientific research is one of the central objectives. For example, it would be possible to split the final project into two parts. The first part (under graduation project I) could be conducted in the seventh semester and require students to do literature research and to prepare a research proposal for their project. The second part (under graduation project II) could be conducted in semester eight; it should include the necessary practical work in the lab, a written report, and an oral defence. Therefore, the peers expect EMU to introduce a compulsory final research-oriented project into the Bachelor's curriculum. The recommended minimum scope of the final project is 6 ECTS points or 180 hours of students' workload, and the programme's goal should be to introduce students to research activities and independent practical laboratory work.

The curriculum of the <u>Master's degree programme Medical Biotechnology</u> is designed for two semesters and consists of 30 EMU credit points (CP), which is equivalent to 60 ECTS points. Ideally, students should take 5 courses per semester and finish their studies within two semesters. However, some students choose to take fewer courses per semester and finish their studies within 1.5 years.

There are three compulsory courses in the <u>Master's degree programme Medical Biotech-</u><u>nology</u>. The course "Molecular Biology and Genetics" (7 ECTS points) covers eukaryotic gene expression and regulation, eukaryotic cellular processes, and epigenomics. In addition, relevant ethical, legal and social issues are discussed. In the course "Fundamentals of Biotechnology" (7 ECTS points), basic concepts in biotechnology are introduced. In addition, the history, development, and current applications of biotechnological products are outlined and serve as the basis for the elective courses. The third compulsory course is the "Term Project", here students prepare an independent semester project on a selected topic. The project needs to be written and to be evaluated in a presentation in front of a three-member scientific jury. However, the peers point out that the term project is not equivalent to a Master's thesis; it is a literature survey and a summary of the current scientific knowledge about a particular subject. In addition, no credits are awarded for the "Term Project", although it is a compulsory module. For this reason, the peers expect EMU to find out about the students' workload of the "Term Project" and award the appropriate amount of ECTS points for it.

Concerning the missing Master's thesis, the peers emphasise that graduates of the <u>Master's</u> <u>programme Medical Biotechnology</u> should be able to discuss complex life science issues as well as own research results comprehensively and in the context of current international research and present these (e.g., final project/Master's thesis) in writing as well as orally. The final project should encompass an independent scientific achievement appropriate indepth to the intended level of education. It could, therefore, be associated with an initial experimental phase. Similar to the suggestions concerning the Bachelor's programme, the final project could be split up into two parts.

Complementing the compulsory courses, students can choose electives from a course list provided by the Department of Biological Sciences. Students need to take eight different elective courses according to their specific areas of interest. Electives include, for example, courses such as "Genome Editing and Gene Therapy", "Medical Biotechnology in Diagnostics and Therapeutics", "Biomarkers and Drug Development", "Applications of Biotechnology in Assisted Reproduction", "Vaccines and Immunity", and "Epigenetics and Epigenomics".

Part-time studies are possible in both degree programmes. According to EMU's academic regulations, students can register for the programme on a part-time basis upon the recommendation of the Department Chair or Dean and the consent of the Rector's office, if they have a valid reason. Some students take this opportunity because they have to work to finance their studies and living expenses. As a result, part-time students have a reduced workload and take longer to finish their degrees.

During the optional summer semester, students have the opportunity to complete their workload and to make up for missed or failed courses.

The information about the curricula of both degree programmes and the respective module descriptions are available on the programmes' webpages.

#### **Criterion 1.4 Admission requirements**

#### Evidence:

- Self-Assessment Report
- EMU admission requirements: https://www.emu.edu.tr/en/prospective-students/admission-requirements/1180
- EMU tuition fees: https://www.emu.edu.tr/fees

#### Preliminary assessment and analysis of the peers:

Applications to all EMU undergraduate programmes are accepted twice a year. The applicant must verify her/his successful graduation from secondary school and must provide additional relevant certified documents, such as transcripts and photocopy of the passport or birth certificate. Students who hold an Associate Degree or a National Diploma can apply as transfer student to the Bachelor Degree programmes at EMU. All applicants with English as a second language must take the EMU English Proficiency Exam or present documents demonstrating their English proficiency level. Applicants who are citizens of Turkey are placed through the Turkish National University Entrance Examinations. Citizens of North Cyprus are required to sit for the EMU English reference Examination. The EMU entrance exam takes place in July annually; it consists of 100 multiple choice questions on four main subjects, each comprising 25 questions: mathematics, science, Turkish language, and social sciences. Applicants from countries other than Turkey or North Cyprus are enrolled based on the set quota for third countries and their performance in high school. During the audit, the peers learned that the Registrar's Office of EMU decides on the admission of the students and that the Department of Biological Sciences is just informed about the result. However, the peers point out that the admission criteria for international students applying for the Bachelor's programme (high school grades and verification of English proficiency) must be made transparent, e.g. by publishing them on EMU's web page.

There is no fixed number of places for admission, while approximately 50 new students are enrolled in the programme each semester. However, there is a limit for students in each course; if many students are taking one class, the group is divided, and the course is taught twice. Therefore, the Department of Biological Sciences can accept a maximum of around 50 new students every year; this number is determined by the available laboratory places and the number of teachers and lab instructors.

Admission procedures take place in summer for the fall semester and in winter for the spring semester. Applicants are advised to make their applications by the end of December or August for spring and fall semesters, respectively. Application deadlines are announced on the website of the Department of Biological Sciences and of the Registrar's Office. Prospective students are required to apply online. As the programme is taught in English, evidence of sufficient English proficiency is required. If a prospective student does not have a sufficient English language qualification, English proficiency is assessed by an examination at EMU. If the English level does not meet the requirements students, need to take additional English languages classes (English Language Preparatory Year Programme).

Academic Year	International Students	Students from North Cyprus	Students from Turkey	Total
2016-2017	204	60	16	280
2017-2018	175	71	14	260
2018-2019	453	65	14	532
2019-2020	526	75	15	616

In the following table, the number of applications for the Bachelor's programme is shown:

Applicants to the <u>Master's degree programme Medical Biotechnology</u> need to have a Bachelor's degree in molecular biology and genetics, or a related natural or molecular sciences field with a GPA of at least 2.5 (out of 4.0). Candidates who do not fulfil the required criteria, may be obliged to take deficiency courses offered as part of EMU's Molecular Biology and Genetics undergraduate programme. Since the Master's programme is fairly new, statistical data is only available from 2019. In 2019, there were 65 applications for the <u>Master's degree programme Medical Biotechnology</u>, which have enrolled as new students. The number is similar for 2020.

In terms of financial support of students, EMU has a well-developed scholarship system, which offers different levels of tuition discounts from 25 %, 50 % up to 100 %. In addition, students with a high GPA can apply for a scholarship also during their studies. All relevant information is provided on EMU's webpage.

During the discussion with the students, the peers learn that some students are self-paying and have to cover the tuition fees and their living expenses on their own. However, almost all students from Turkey and North Cyprus receive scholarships that cover between 50 % and 100 % of the tuition fees, which are approximately \$ 800 per course in the Master's programme and around \$ 700 per course in the Bachelor's programme.

In summary, the auditors confirm that the admission requirements support the students in achieving the intended learning outcomes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

The peers appreciate that EMU has initiated a curriculum revision processes for both programmes in order to offer compulsory final projects which would create opportunities for every student to carry out hands-on experimental (wet-laboratory) research. The peers support these plans and expect EMU to submit the updated curricula and the related module descriptions for the graduation projects in the further course of the procedure.

As EMU now awards 10 ECTS point for the "Term Project" in the Master's programme, the peers are satisfied to this respect.

The peers consider criterion to be mostly fulfilled.

## 2. The degree programme: structures, methods and implementation

#### **Criterion 2.1 Structure and modules**

#### **Evidence:**

- Self-Assessment Report
- Study plans
- Module descriptions

#### Preliminary assessment and analysis of the peers:

The <u>Bachelor's degree programme Molecular Biology and Genetics</u> comprises 40 courses, out of which 34 are obligatory and 6 are electives. In addition, there are 5 courses planned for each semester; thus, the curriculum should be completed within 8 semesters (4 years).

The curriculum of the <u>Master's degree programme Medical Biotechnology</u> consists of 11 courses, three of them are compulsory, and eight are electives.

After analysing the module descriptions and the study plans, the peers agree that in the <u>Bachelor's degree programme Molecular Biology and Genetics</u> as well as in the <u>Master's</u> <u>degree programme Medical Biotechnology</u> the individual courses correspond with the definition of "module" in the sense that each course is a sum of coherent learning and teaching units.

The arrangement of the courses is presented in the study plans, and each course's intended learning outcomes are specified in the respective module description. The module descriptions, which are accessible via the programmes' webpages, also describe the content and training activities as well as the educational and assessment methods of each course.

Furthermore, for each of the two programmes, EMU provides Objective-Module Matrices that clearly exhibit what module's intended learning outcome should be achieved.

Due to Covid restrictions in the last two semesters, some practical courses could not be conducted by the students in the laboratories but were demonstrated online by the teachers. However, starting with the upcoming semester (fall semester 2021/22), students will be allowed to enter the laboratories and do practical work there.

Concerning the curriculum of the Bachelor's programme, the peers see that there are some redundancies. For example, cell communication and cell structure are covered in several courses (see Objectives-Module-Matrix). In addition, the peers consider that one course in organic chemistry is sufficient; it could be offered in the third semester and the course in biochemistry in the fourth semester. Therefore, the peers suggest resolving these redundancies and offering only one course in organic chemistry. This would open up the possibility of integrating a final project into the curriculum.

Moreover, the peers see that genom-wide gene expression analysis (RNAseq) is so far not covered by the curriculum. It should be part of the Bioinformatics module. Besides these aspects, the peers confirm that the curriculum of the Bachelor's programme is well designed and covers all essential fields of theoretical molecular biology and genetics.

During the audit, one of the most critical issue was the question, whether students of the Bachelor's as well as of the Master's programme gain enough practical experiences in the laboratories. The graduates criticise that they did not have enough hands-on experience in dry and wet labs when they joined Master's programmes in Europe: Their theoretical and writings skills are very good, but there is a lack of research-oriented laboratory work in the curriculum of the Bachelor's programme. This deficit needs to be solved; the introduction of a compulsory Bachelor's thesis is one crucial step in this direction. This would give graduates a better starting point and further promote their job perspectives or the admission into a master's or PhD program. However, some graduates are accepted by Master's programmes in Europe which is a proof for the high quality of the programme and the motivation and international attitude of the students. However, it is emphasized that most European and North American universities require a research-oriented laboratory project as requirement for admission to master or doctoral programs. Therefore, the peers again emphasise the mandatory requirements for a bachelor's and master's thesis.

Bachelor's students especially appreciate the broad scientific education in the first semesters and the focus on neuroscience and molecular biology in the higher semesters. In addition, students decided to study at EMU because of the university's good reputation, the international atmosphere at the Department of Biological Sciences and the affordable tuition fees.

Concerning the Master's programme, the peers point out that there need to be researchoriented courses in the curriculum and students need to carry out independent scientific and practical work in Medical Biotechnology.

The employers corroborate this assessment and stress that interns from European countries have more practical experience with laboratory work than those from EMU. However, students from the Department of Biological Sciences have a very good theoretical knowledge, but they show deficiencies putting it into practise.

The peers emphasise that a higher proportion of the curriculum of the Bachelor's as well as of the Master's programme needs to be dedicated to practical and research-oriented work (e.g., experimental laboratory work, practical exercises, project work, excursions and field trips).

During the audit, the peers discussed with the programme coordinators if there are any cooperations with companies. They learn that the industrial base in North Cyprus is rather

limited particularly in molecular biology and biotechnology. For this reason, there are almost no opportunities for the Department of Biological Sciences to establish cooperations with local companies. Hence, the Department of Biological Sciences should expand their field of view and try to contact companies in the Middle East and Europe, especially for conducting internships and final projects. Furthermore, the peers see that there is a restriction for the international students to get a visa for European Countries, especially for students from Africa and Asia. Nevertheless, EMU and the Department of Biological Sciences should strive to co-operate with some companies; this would further promote the student's scientific education and offer them the opportunity to gain valuable practical experiences.

In summary, the peers gain the impression that the choice of modules and the curriculum's structure ensures that the intended learning outcomes of the respective degree programme can be achieved.

#### International Mobility

EMU's International Office manages the international mobility of students, administrative staff, and teachers to increase EMU's international visibility and attract qualified international students and staff members.

On the one hand, students of the Department of Biological Sciences come from 23 different countries, and there is a very international atmosphere at the Department. On the other hand, not many students spend some time abroad during their studies. Moreover, the academic mobility is limited due to visa restrictions; e.g., only one or two students from the Department of Biological Sciences go abroad every year. EMU offers some exchange programmes for all students, the organisation is supported by the International Office, and the teachers also offer support and advice in choosing a suitable university. However, students usually have to cover the costs by themselves.

In general, EMU and the Department of Biological Sciences have an international orientation and try to attract students worldwide. In addition, most of the staff members have spent some considerable time at international universities, e.g., for doing their PhD. However, the political isolation of North Cyprus and the lack of official access to the European academic market are the main challenges for the University on its way to establishing and enhancing relationships with western higher education institutions. The peers point out that they appreciate the international character of the degree programmes at EMU on the one hand; on the other hand, they encourage the Department of Biological Sciences to offer more opportunities for their students to spend some time during their studies abroad. Political issues should not hamper the development of research and academic exchange in science, and even more so when it concerns natural and medical sciences. A good starting point is the teachers' international connections; they could also be used for offering students the opportunity to conduct their final project at an international university.

The peers observe that EMU's transfer policies do not fully comply with the Lisbon Convention on recognizing qualifications. According to it, recognition of credits acquired outside EMU should be granted unless EMU proves substantial differences in the achieved competences. Currently, the Department and the Faculty Board have to agree with the learning agreement before the students go abroad, and the content of the course must be at least 80 % similar to the content of the course at EMU. EMU needs to establish a regulation that defines an adequate set of conditions for recognising credits acquired outside EMU, which are aligned with the Lisbon Convention.

Due to the restrictions in cooperation with European universities, the programmes at EMU appeal primarily to applicants from Asian, Arabic and African countries, which constitutes a developing market with an increasing demand for higher education. This strategy complies with the general strategy of EMU to be competitive in the Middle East, North Africa and Eastern Mediterranean. The programme manager emphasises that although their students cannot participate in such European exchange programmes like ERASMUS, it is possible for them to establish contacts with European and American universities individually.

#### **Criterion 2.2 Work load and credits**

#### Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions

#### Preliminary assessment and analysis of the peers:

The auditors appreciate that EMU applies the European Credit Transfer and Accumulation System (ECTS). According to EMU's regulations, 30 hours of student workload (including lecture hours and self-study hours) are equivalent to one ECTS point. The auditors confirm that the information about the workload in hours (including the distinction between class-room work and self-studies) is available to the students. The awarded ECTS points and the underlying students' total workload is based and regularly verified through the student surveys, which have detailed questions regarding how much time students spend on each course. However, the peers point out that the information about the awarded ECTS points and the students' total workload should also be included in the module descriptions. In addition, EMU uses a credit point system, in which for each lecture hour (per week) a student is awarded 1 EMU credit and for each laboratory hour 0.5 EMU credits.

The students confirm in discussion with the peers that the workload is adequate and that it is possible to finish the programmes within four years (Bachelor's programme) or one year (Master's programme).

The peers learned during the audit that students mostly drop out of the Bachelor's programme within the first two semesters because they did not expect how demanding the programme is and thus do not cope with the courses and leave the programme. Several students struggle with calculus; for this reason, the Department of Biological Sciences designed Math 150, which is offered primarily for Molecular Biology students. Before, there was a general course in calculus for science and engineering students. This change has increased the passing rate and students' satisfaction. For this reason, the peers point out that it would also be helpful to offer classes in physics and chemistry particularly tailored for biologists, just like calculus. The courses can still be taught by a teacher from the Department of Chemistry or respectively the Department of Physics. Still, the content should be adjusted to the needs of the molecular biology and genetics students; it should include applied problem-oriented case studies to show the importance of mathematics, chemistry, and physics for biological and medical sciences.

Other students leave the programme for personal or financial reasons. However, there is no structural problem within the programme that would cause students to drop out.

Based on the study plans, the statistical data, and the students' comments, the auditors conclude that there are no obstacles to the quality of teaching and the level of education due to the workload.

#### **Criterion 2.3 Teaching methodology**

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions

#### Preliminary assessment and analysis of the peers:

The <u>Bachelor's degree programme Molecular Biology and Genetics</u>, as well as the <u>Master's</u> <u>degree programme Medical Biotechnology</u>, are face-to-face degrees, which make use of several different educational methods for each course such as practical work, presentations, assignments, exercises, lectures, and papers.

Predesigned laboratory experiments are compulsory for students to gain hands-on experience. Written assignments such as term papers are frequently used as tools to promote critical thinking and scientific writing skills and literature search abilities. In-class exercises are often included. Most classes also promote class participation and discussion. In several courses, students are given presentation assignments to promote their scientific presentation skills.

To supplement the curriculum, the Department of Biological Sciences organises the "Medical Biotechnology Webinar Series" every semester. Scientists from different parts of the world give talks about their research, including cancer biology and infectious diseases. Webinars are carried out in small groups so students can get a chance to talk to the speakers and ask questions. Other activities are Molecular Biology and Genetics career days. These events feature scientists working in different fields and help students to decide upon their future careers.

EMU's educational model is intended to actively involving students in the learning processes, and focuses on continuous assessment. Therefore, training activities and assessment forms applied in the courses should facilitate the acquisition of the intended learning outcomes.

Master's and PhD students should be more involved in teaching and supervising Bachelor's students. This would also help reduce the teachers' workload and open up space for introducing a final project.

Teachers and students use a digital learning platform to present documents and interact with each other. Via the platform, students can access electronic mails and academic information and register for courses online.

In summary, the auditors consider the applied teaching methods and the underlying didactic concept as appropriate and helpful in supporting the students in achieving the intended learning outcomes.

#### **Criterion 2.4 Support and assistance**

#### Evidence:

• Self-Assessment Report

#### Preliminary assessment and analysis of the peers:

EMU offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, every student is assigned to an academic advisor. Each academic advisor is a member of the academic staff and is a student's first port of call for advice or support on academic or personal matters. The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development, and help with problems with other teachers. In addition, each student has an alternate adviser, who can help the student if their "regular advisor" cannot be contacted. Furthermore, the Department Chair has access to records and academic details of all students registered in the Department and provides close guidance to first-time academic advisers.

All students of the <u>Master's degree programme in Medical Biotechnology</u> have the same academic adviser, who guides them for registration-related issues and makes sure that the students follow the curriculum correctly to ensure their success and timely graduation. This is possible because there are only a few students in the programme.

Besides the Department of Biological Sciences, support for undergraduate students is provided by the Faculty of Arts and Sciences, Registrar's Office (Student Services Office), Accounting Office, the Rector's Office, Student Affair Division, Health Center, and the Psychological Counselling Center.

The peers learn that the members of the teaching staff and especially the programme coordinators are available for any issues regarding the degree programmes and offer academic advice. They appreciate this "open door policy" and also notice the excellent and open-minded relationship between students and teaching staff. In addition, there are enough resources available to provide individual assistance, advice and support for all students. The support system helps students to achieve the intended learning outcomes and to complete their studies successfully and without delay. It is one of the strong points of the Department of Biological sciences.

#### Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

The peers agree with the changes in the curriculum of the Bachelor's programme with respect to removing of one of the organic chemistry courses and to shifting the biochemistry course from 6th to 4th semester. Similarly, the peers are satisfied that their suggestions concerning the physics courses are adopted and that EMU will offer new physics courses, which are tailored specifically for biologists and biomedical scientists.

The peers consider criterion 2 to be mostly fulfilled.

### 3. Exams: System, concept and organisation

#### Criterion 3 Exams: System, concept and organisation

#### Evidence:

- Self-Assessment Report
- Module descriptions
- Study plans
- EMU Academic Calendar
- EMU Regulation for Examinations and Evaluation

#### Preliminary assessment and analysis of the peers:

According to the Self-Assessment Report, the students' academic performance is evaluated based on their attendance and participation in class, laboratory work and reports, assignments, homework, quizzes, presentations, mid-term exam, and the final exam at the end of class each semester. The form and length of each exam are mentioned in the module descriptions available to the students via EMU's homepage.

The most common evaluation type used is written examinations; however, quizzes, laboratory work, assignments (small projects, reports, etc.), presentations, seminars, and discussions may contribute to the final grade. Written examinations, either closed-book or open-book, typically include short answers, essays, problem-solving or case-based questions, and calculation problems. Some lecturers also give multiple-choice or true-false questions in examinations or quizzes. The grade from laboratory work usually consists of laboratory skills, discussions, reports, and oral exams. In addition, students can acquire "extra credits" for additional assignments within the course to improve their grades. Extra credits can contribute a maximum of 5 % to the final grade.

The Department of Biological Sciences requires at least 70 % attendance for each course throughout one academic semester. Students are informed about mid-term and final exams via the Academic Calendar. The final grade results from the different activities in the course (e.g., laboratory work, mid-term exam, the final exam, quizzes or other given assignments).

Make-up exams for mid-terms are usually scheduled for the end of the semester, one week before final exams. For those students who miss a final exam or fail a module, re-sit exams are held at the end of each semester after the final exams. If students have any issues regarding fair grading of the exams, they can appeal to the Department for re-evaluation by an independent committee. Bachelor's students can retake a class as many times as they want; they just have to repeat the course and pay extra tuition fees for it. In the Master's programme, students can only retake a failed course once.

The peers point out that there is no obligatory research-oriented graduation/thesis research project envisaged in the curriculum. A research-oriented final project needs to be included in both degree programmes. This is the gold standard of higher education in most European and North American universities. The university explains that the programme module structure follows the Turkish Higher Education Council (YÖK) criteria, according to which graduate projects for Molecular Biology and Genetics programmes are not required. Bachelor's students can join the teachers' research projects, but it is not a compulsory task, and is done voluntarily. More students should take this possibility and would be a good starting point in establishing an obligatory final research-oriented final project.

Furthermore, the peers point out that research projects can be designed that can be included in a final Bachelor's and Master's theses. At the same time, Master's students can help the teachers to supervise and instruct Bachelor's students during their research project in the lab. In addition, designing and writing an application for a research grant could also be a suitable topic for a final project, and it is also possible to conduct low budget final projects. Other possibilities are developing a joint thesis project that can be performed by several students as a group work and co-operating with other universities outside Cyprus and companies to find suitable topics for the final projects.

The peers discuss with the students how many and what kind of exams they have to take each semester. They learn that for each course there is one mid-term exam and one final exam in every semester. Usually, there are additional practical assignments or tests (quizzes). The final grade is the sum of the sub-exams. The students appreciate that there are several short exams instead of one big exam. Nevertheless, students think that two graded quizzes per course would be enough; otherwise, the number of exams (including mid-term and final exams) would be too high. In addition, the students criticise that the contribution of the quizzes to the final grade (30 %) is very high, and they would appreciate if the share would be reduced. The peers support this view and suggest that the number of graded quizzes per course should not exceed two per semester. Otherwise, the exam load would be too high.

The students confirm that they are well informed about the examination schedule, the examination form, and the grading rules. However, they point out that the grading system is different in other departments of EMU. For example, in the Department of Biological Sciences, it is necessary to get 90 % to receive an A; in other departments only 85 % are required. This seems unfair to the students, and it would be helpful to have the same grading scheme in every department.

The peers conclude that the criteria regarding the examinations system, concept, and organization of exams are fulfilled and that the examinations are suitable to verify whether the intended learning outcomes are achieved or not.

#### Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The peers appreciate that EMU will make the differences in the grading systems transparent to the students.

The peers consider criterion 3 to be mostly fulfilled.

### 4. Resources

#### Criterion 4.1 Staff

#### Evidence:

- Self-Assessment Report
- Staff handbook
- EMU regulation for Appointment of Academic Staff
- EMU research Policies and Guidelines

#### Preliminary assessment and analysis of the peers:

At EMU, the full-time staff members hold various academic positions. There are full professors, associate professors, assistant professors, and laboratory instructors. Specifically, at the Department of Biological Sciences the faculty consists of only one full professor, four assistant professors, and five laboratory instructors. Practical laboratory work is supported by three part time instructors as the high teaching load of the professors prevents in depth supervision of lab work (see below).

The academic position of each teacher is based on research activities, publications, teaching, supervision of students and other supporting activities. For example, a professor needs to hold a PhD degree. The peers especially appreciate the gender politics at the Department of Biological Sciences; three of the five professors are female. The auditors discuss with EMU's management how new staff members are hired. Vacancies are publicly announced via the official webpage of the University. EMU hires new staff members according to the needs and requests of the departments. New academic staff members are usually employed as instructors or assistant professors. The EMU regulation for Appointment of Academic Staff describes further details about the application and decision-making process.

The peers see that the teachers at the Department of Biological Sciences are professionally qualified and obtained their PhD degrees from abroad. Their research and teaching qualification profiles fit well with the scientific focus of the degree programmes. Furthermore, their research experiences correspond with the goals of the degree programmes. In addition, the peers point out that the teaching staff is very dedicated to the Department of Biological Sciences as well as to their students.

During the discussion with the auditors, the teachers pointed out that their teaching load is 12 hours per week. Therefore, they have only limited opportunities to follow their research interests at EMU during the semester. This is primarily due to their high teaching load, the limited laboratory space, which is primarily used for teaching, and, most importantly, the lack of research funding for consumables. Consequently, teachers usually conduct their research activities during the summer months and almost always depend on their international contacts. Based on the publication records in the teachers' CVs, the peers conclude that the scientific contribution of all teachers was very good; however, the output significantly decreased after they started working at EMU. In addition, there is no sabbatical possible for the teachers at EMU, and they can only apply for unpaid leave.

In contrast, the official promotion criteria create a high pressure to publish papers. However, due to a heavy workload and lacking research funding, it might be almost impossible for most teachers to achieve the necessary scientific publications in their research and have an extensive teaching load. In addition, during the audit, the peers learn that the lab manager position at the Department of Biological Sciences is vacant. This situation needs to be alleviated and the position should be filled as soon as possible.

Considering that the number of full-time teachers at the Department of Biological Sciences is already relatively low compared to international standards (the teacher-student ratio is around 1 to 30), it is evident that the Department of Biological Sciences is understaffed and needs more full-time academic staff members. In addition, more time is required for teaching additional practical laboratory work, and most importantly, for the supervision of mandatory research-oriented final projects.

#### **Criterion 4.2 Staff development**

#### **Evidence:**

- Self-Assessment Report
- Staff Handbook

#### Preliminary assessment and analysis of the peers:

Typically, new full-time academic staff members are guided by more experienced staff in several areas, including course preparation, teaching, and academic advising. In addition, full-time members guide part-time staff members in the same manner. Further development of the teachers is achieved by encouraging them to attend national and international scientific and educational events. This is done by the EMU administration as well as the Department of Biological Sciences.

Funds are provided for project development as well as conference attendance via the EMU Research Advisory Board. In addition, research leaves (a semester or longer) can be granted for academic staff wanting to pursue research at different institutes or universities around the world. However, during these leaves, the teachers are not paid by EMU. Rules and regulations for the publication awards and research leave are published on EMU's webpage.

At the Department of Biological Sciences, scientific talks and presentations are open to all academic staff members, facilitating scientific communication within the Faculty. In addition, webinars are given by different staff members and outside speakers on different research topics.

#### **Criterion 4.3 Funds and equipment**

Evidence:

• Self-Assessment Report

#### Preliminary assessment and analysis of the peers:

EMU provides funding of both programmes and the facilities, and the primary source of income are the students' tuition fees and funds from the Ministry of Education.

Because of the limited industrial base in North Cyprus, there are no cooperations with companies. In addition, EMU faculty do not have many opportunities to apply for research funding from international institutions and to participate in joint international research projects. This is due to the very unusual and unique political situation of North Cyprus, as it is not a recognised political territory that neither is its own country nor belongs to Turkey. So most funding sources are not available to the EMU faculty members.

This strongly restricts their possibilities of developing and conducting own on-site research projects at EMU. Another adverse effect of this situation is a custom-based delay in delivering chemicals and lab materials, which is not the fault of EMU but is an issue that all universities in North Cyprus must encounter.

The peers learn during the audit that EMU's management distributes the budget among the departments. As a result, the department does not have a fixed budget. Still, there is only one budget for the whole university, and the departments have to apply to EMU's general management for funds either for hiring new staff members or purchasing equipment once a year. This is a rather unfortunate situation. It would be more useful to provide a separate budget for the Department of Biological Sciences to maintain instruments and purchase essential chemicals and lab material on short notice. In addition, EMU must consider that study programmes in biomedical sciences (e.g., at the Department of Biological Sciences) need more funds than other programmes because of expensive equipment and chemical and supplies for laboratory work.

The peers see that the available budget is sufficient for adequately conducting teaching and learning activities in both degree programmes. The modern laboratories include almost all essential equipment. However, there are also some shortcomings. For example, a fluorescence-based flow cytometer must be added for single-cell analysis, a standard method in modern cell biology, neurology, and immunology labs. In addition, in the chemistry laboratory, more instruments for analytical analysis are needed. The peers also emphasise that students should have enough funds to carry out their final projects and the involved research activities. Another critical aspect is the limited space in the laboratories. The peers strongly recommend that it is urgently necessary to open up a new laboratory as intended by the Department of Biological Sciences. Currently, the different courses have to use the same biology laboratory; this laboratory is well equipped but only a limited number of workplaces are available. On the other hand, the chemistry and the physics laboratories are sufficiently equipped to conduct the respective experiments.

Since it is essential for students to gain sufficient practical experience in laboratory work, the peers also strongly recommend increasing the scope of practical laboratory work. Usually, students do the experiments together in groups of two to five students (depending on the course); however, there should be enough instruments and laboratory space (including fume hoods) to conduct the experiments by groups of two to a maximum of three students. Otherwise, students may not acquire the necessary hands-on experience in conducting experiments and in the responsible and safe use of chemicals.

The students also express their satisfaction with the library and the available books and access to electronic literature and scientific databases. Especially they commend EMU's

comprehensive digital platform and good IT infrastructure. Students can access all necessary information and documents about the programmes online. The peers consider this is one of the strong points of EMU and the Department of Biological Sciences.

EMU students have access to the University Central Library. According to the information provided by EMU, the Central Library is a four-storied building with an enclosed area of 7000 m<sup>2</sup>. The building is equipped with Wi-Fi and a central heating and cooling system. Its capacity is about 1,200 seats. The library is open for students and staff members from 09:00 to 22:30 on working days and 10:00 to 20:00 on weekends. During exam periods, the library funds are available till 1:00, and the 1st floor stays open throughout the night.

In summary, the peer group judges the available funds, the technical equipment, and the infrastructure (laboratories, library, seminar rooms etc.) to comply – besides the mentioned restrictions- with the requirements for adequately sustaining the degree programmes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

The peers appreciate that formal documentation on initiating the hiring process for the vacant position of laboratory manager and for an additional academic staff member has been sent to the Rector's office. They hope that the positions will be filled soon.

The peers support the Department of Biological Sciences in their request to the Rector's office to purchase a flow cytometer.

The peers consider criterion 4 to be mostly fulfilled.

## 5. Transparency and documentation

#### **Criterion 5.1 Module descriptions**

#### Evidence:

- Self-Assessment Report
- Module descriptions

#### Preliminary assessment and analysis of the peers:

EMU provides module descriptions that include all necessary information about teaching methods, awarded credit points, intended learning outcomes, content, admission and examination requirements, forms of assessment, details explaining how the final mark is calculated, and biographical references. However, while analysing the module handbooks, the peers see that the module descriptions (course outlines) do not include the necessary information about the awarded ECTS points and the students' total workload (contact hours, time for self-studies). For this reason, the peers expect EMU to update the module descriptions and include all required information.

The module descriptions for the Bachelor's programme are accessible to all stakeholders via the programme's webpage. However, this is not the case in the Master's programme. The study plan is accessible here, but the module descriptions are not linked with the listed courses. Consequently, the peers require EMU to make the module descriptions of the master's programme available to all stakeholders, e.g., by publishing them on the programme's webpage.

#### **Criterion 5.2 Diploma and Diploma Supplement**

#### Evidence:

- Self-Assessment Report
- Sample Transcript of Records
- Sample Diploma Certificate
- Sample Diploma Supplement

#### Preliminary assessment and analysis of the peers:

The peer group confirms that a Diploma Supplement is issued to all graduates of the <u>Bachelor's programme Molecular Biology and Genetics</u>. It includes all necessary information about the structure and content of the respective degree programme. It also informs about the qualification gained, including the achieved learning outcomes and the level and status of the pursued and successfully completed studies.

Unfortunately, EMU could not provide a similar Diploma Supplement for the <u>Master's pro-</u> <u>gramme Medical Biotechnology</u>. For this reason, the peers expect EMU to draft a Diploma Supplement, similar to the one for the Bachelor's programme, and to hand it out to every student upon graduation.

The Transcript of Records lists all the graduate courses, the achieved credits, grades, and cumulative GPA.

#### **Criterion 5.3 Relevant rules**

#### **Evidence:**

- Self-Assessment Report
- Webpage Eastern Mediterranean University: https://www.emu.edu.tr/en
- Webpage Department of Biological Sciences: https://etseq2.urv.cat/etseq/en/15-ensenyaments.html
- Webpage Ba Molecular Biology and Genetics: https://www.emu.edu.tr/en/programs/molecular-biology-and-genetics-undergraduate-program/891
- Webpage Ma Medical Biotechnology: https://www.emu.edu.tr/en/programs/medical-biotechnology-masters-program-without-thesis/1570

#### Preliminary assessment and analysis of the peers:

The auditors confirm that the rights and duties of both EMU and the students are clearly defined and binding. All rules and regulations are published in Turkish and English on the university's webpage. However, it would be necessary to link the curriculum of the <u>Master's programme Medical Biotechnology</u> on the programme's webpage with the course outlines and EMU needs to draft a guideline for recognising credits achieved outside EMU that is aligned with the Lisbon Convention.

#### Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The peers expect EMU to provide the necessary information about the degree programmes on its website as soon as possible and to submit a sample of a complete Diploma Supplement for the Master's programme in the further course of the procedure.

The peers consider criterion 5 to be mostly fulfilled.

## 6. Quality management: quality assessment and development

Evidence:

• Self-Assessment Report

#### Preliminary assessment and analysis of the peers:

EMU has three main bodies responsible for organising and implementing the quality assurance processes. The University Quality Coordination and Evaluation Board, which is at the same time the University Executive Board, reviews evaluation reports, defines quality policies and ensures their implementation. Academic Units Evaluation and Quality Improvement Commission are both established by the University Executive Board and are responsible for evaluating quality improvement actions.

Students give their feedback on the courses through anonymous online questionnaires at the end of each semester. They assess various aspects such as students' understanding, lecturer's preparation, course delivery, lecturer's proficiency, explanation of course objectives, and references in each enrolled course. The feedback is categorised from strongly disagree to agree strongly, the results of the surveys are visible to the course instructor, the Department Chair, and the Dean. In case of negative feedback, the Department Chair supervises the course instructor and supports staff development and improvement.

Students are involved in the university's decision-making bodies, such as the EMU Senate and the University Executive Board. A student representative is a member of each of these boards. In particular, the Department Board includes four full-time teachers and a student. In addition, there is an open-door policy at EMU, meaning that students can refer to any faculty or administration member directly to express their comments and questions.

All degree programmes at EMU are subject to continuous external evaluation by the YÖK -Turkish Higher Education Council from Turkey. The most recent on-site evaluation of the Faculty of Arts and Sciences and the Department of Biological Sciences was performed in April 2021. The Department of Biological Sciences also relies on international accreditation for continuous improvement and quality assessment.

The auditors observed that the courses are rather small. Consequently, there is a direct contact between programme coordinators and students and the possibility of personally discussing course deficits. The auditors understand that the students' feedback is taken seriously by the teaching staff and the programme coordinators and changes are made if there is negative feedback. But they point out that it is also necessary to directly discuss the results of the satisfaction surveys. During the audit, students and graduates confirmed that they would like to see the direct consequences of the surveys. From the peers' point of view, it is necessary to close the feedback loops and actively involve the students in the quality assurance processes. This would motivate them to participate if changes and adjustments are directly visible to them and explain to them what consequences the surveys have.

In addition, the peers point out that it is not clear how the students' representatives on the different boards are selected or chosen; this should be made transparent. Moreover, it would be useful to establish a speaker for each year and have them meet regularly and join the Faculty and Department Board.

EMU has established the Alumni Communication and Career Research Directorate (MIKA) that is responsible for staying in contact with the alumni. In addition, teachers communicate directly with alumni, and social media (e.g. Facebook, Instagram) is actively used to contact the alumni. Employers are not formally involved with the quality assurance processes at EMU, but they can inform the teachers if they have some suggestions on further developing the degree programmes.

In summary, the peer group confirms that the quality management system is suitable for identifying weaknesses and improving the degree programmes. The students are involved in the process, but the feedback loops need to be closed and the students' involvement in the panels could be increased.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The peers support the plans to hold a "Student Survey Outcome Meeting" at the end of each semester to discuss the students' comments and suggestions. However, EMU should provide documentation of these meetings and make transparent what consequences the discussions will have.

The peers consider criterion 6 to be mostly fulfilled.

0

## **D** Additional Documents

Before preparing their final assessment, the panel asks that the following missing or unclear information should be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

• none

## E Comment of the Higher Education Institution (09.11.2021)

#### EMU provides the following detailed statement:

EMU Department of Biological Sciences presents the response statement to ASIIN Draft Report dated 15 October 2021. This statement is organized into the following 4 sections:

- I. A point-by-point response to each required change with action items
- II. A list of suggestions by the ASIIN team and areas to be developed by the Department
- III. A list of comments by the ASIIN team to be conveyed to the Rector's Office
- IV. Minor clarifications

We would like to state that Department of Biological Sciences has made plans and has taken formal action to start implementing all the revisions and updates required by the ASIIN auditor team.

Especially, the Departmental Board would like to extend their gratitude to the ASIIN team for the time they have taken to evaluate our programs; and particularly for their constructive comments and suggestions, which would aid in further improving and developing both programs.

#### SECTION I

#### COMMENTS/SUGGESTIONS/POINTS MADE by ASSIN AUDITORS and RESPONSE STATE-MENTS by the DEPARTMENT OF BIOLOGICAL SCIENCES

#### Comment 1 (ASIIN Report Pages 9, 10, 11, 22)

"However, in both programs, students need to conduct a research-oriented laboratory project in biomedical sciences."

"The peers point out that the program lacks a graduation paper or research project required at the end of the Bachelor's programme."

" The first part (under graduation project I) could be conducted in the seventh semester and require students to do literature research and to prepare a research proposal for their project. The second part (under graduation project II) could be conducted in semester eight; it should include the necessary practical work in the lab, a written report, and an oral defence. Therefore, the peers expect EMU to introduce a compulsory final research-oriented project into the Bachelor's curriculum."

" The final project should encompass an independent scientific achievement appropriate indepth to the intended level of education. It could, therefore, be associated with an initial experimental phase. Similar to the suggestions concerning the Bachelor's programme, the final project could be split up into two parts."

" The peers point out that there is no obligatory research-oriented graduation/thesis research project envisaged in the curriculum. A research-oriented final project needs to be included in both degree programmes."

#### Response 1

Department has initiated curriculum revision processes for both programs to integrate compulsory projects which would create opportunities for every single student to carry out handson experimental (wet-laboratory) research. The curriculum revisions, already discussed with the Dean of Faculty of Arts and Sciences and the Director of the Institute for Graduate Studies, are as follows:

#### Molecular Biology & Genetics Undergraduate Program

7<sup>th</sup> Semester: addition of the new compulsory course BIOL4XX Graduation Project 1 (3 EMU Credits – ECTS to be calculated based on student surveys after completion of the courses for the first time)

The course is to entail proposal and initiation of an undergraduate-level individual research project (experimental wet laboratory work) under the supervision of one of the full-time members of the Department.

8<sup>th</sup> Semester: addition of the new compulsory course BIOL4XX Graduation Project 2 (3 EMU Credits – ECTS to be calculated based on student surveys after completion of the courses for the first time)

The course is to entail continuation, the write-up and oral defence of the individual research project (experimental wet laboratory work) started in the previous term (Graduation Project 1) under the supervision of one of the full-time members of the Department.

Allocation of the new courses mentioned above: Reduction of 1 organic chemistry course (4 EMU credits) and reducing physics credits by a total of 2 credits (these details are further discussed below), would create room for adding the above mentioned 2 courses to the curriculum (6 EMU credits in total).

#### Medical Biotechnology Master's Program

1<sup>st</sup> Semester: addition of the new compulsory course BIOL5XX Research Project 1 (3 EMU Credits – ECTS to be calculated based on student surveys after completion of the courses for the first time)

The course is to entail proposal and initiation of a Master's-level individual research project (experimental wet laboratory work) under the supervision of one of the full-time members of the Department.

2<sup>nd</sup> Semester: addition of the new compulsory course BIOL5XX Research Project 2 (3 EMU Credits – ECTS to be calculated based on student surveys after completion of the courses for the first time)

The course is to entail continuation, the write-up and oral defence of the individual research project (experimental wet laboratory work) started in the previous term (Research Project 1) under the supervision of one of the full-time members of the Department.

Allocation of the new courses mentioned above: The new compulsory courses will add up to 6 EMU credits, consequently, 2 elective courses (total of 6 EMU credits) would be removed from the current curriculum. Total of 6 elective courses would remain.

#### Comment 2 (ASIIN Report Page 11)

".. the peers expect EMU to find out about the students' workload of the "Term Project" and award the appropriate amount of ECTS points for it."

#### **Response 2**

ECTS of the compulsory BIOL599 Term Project has been calculated as 10 and this information has been made available on the Diploma Supplement (also newly-generated based on the ASIIN Audit Team's suggestion as further discussed below.) (Please see **Attachment 1**)

#### Comment 3 (ASIIN Report Page 15)

" Concerning the curriculum of the Bachelor's programme, the peers see that there are some redundancies. For example, cell communication and cell structure are covered in several courses (see Objectives-Module-Matrix)."

#### **Response 3**

Department of Biological Sciences teaching staff are in process of revising their curricula to reduce any redundancies and to apply these changes to their courses starting from Spring 2022 semester.

#### Comment 4 (ASIIN Report Page 15)

" In addition, the peers consider that one course in organic chemistry is sufficient; it could be offered in the third semester and the course in biochemistry in the fourth semester. Therefore, the peers suggest resolving these redundancies and offering only one course in organic chemistry. This would open up the possibility of integrating a final project into the curriculum.

#### **Response 4**

Department has initiated the necessary formal communications with the Department of Chemistry and Physics under the supervision of the Faculty of Arts and Sciences Dean's Office and agreed upon carrying out the following curriculum changes.

Removal of one of the Organic Chemistry courses (4 EMU credits) and keeping only 1 Organic Chemistry Course (only in the 3<sup>rd</sup> Semester and 4 EMU credits in total)

Shifting BIOL320 Biochemistry to earlier in the program from 6<sup>th</sup> semester to 4<sup>th</sup> semester

#### Comment 5 (ASIIN Report Page 15)

" Moreover, the peers see that genom-wide gene expression analysis (RNAseq) is so far not covered by the curriculum. It should be part of the Bioinformatics module."

#### **Response 5**

BIOL312 Bioinformatics and Computational Biology course content and course outline has been revised accordingly (**Attachment 2**).

#### Comment 6 (ASIIN Report Page 18)

" However, the peers point out that the information about the awarded ECTS points and the students' total workload should also be included in the module descriptions. "

#### **Response 6**

As of Spring 2022 Semester, all course outlines will include EMU credits along with calculated ECTS credits as seen in the example provided in **Attachment 2.** 

#### Comment 7 (ASIIN Report Page 19)

" it would also be helpful to offer classes in physics and chemistry particularly tailored for biologists, just like calculus. The courses can still be taught by a teacher from the Department of Chemistry or respectively the Department of Physics. Still, the content should be adjusted to the needs of the molecular biology and genetics students; it should include applied problem-oriented case studies to show the importance of mathematics, chemistry, and physics for biological and medical sciences. "

#### **Response 7**

Department has initiated the necessary formal communication with the Department of Chemistry and Physics under the supervision of the Faculty of Arts and Sciences Dean's Office and agreed upon carrying out the following curriculum changes.

Removal of PHYS101 Physics I (4 EMU credits) in the 3<sup>rd</sup> semester and replace it with a new PHYS1XX course tailored specifically for biologists and biomedical scientists (3 EMU credits).

Removal of PHYS102 Physics II (4 EMU credits) in the 4<sup>th</sup> semester and replace it with a new PHYS1XX course tailored specifically for biologists and biomedical scientists (3 EMU credits).

#### Comment 8 (ASIIN Report Page 25)

" In addition, during the audit, the peers learn that the lab manager position at the Department of Biological Sciences is vacant. This situation needs to be alleviated and the position should be filled as soon as possible."

#### **Response 8**

Formal documentation on initiating the hiring process for the laboratory manager position has been once again sent to the Rector's office on 29.09.2021 (Attachment 3).

#### Comment 9 (ASIIN Report Page 25)

" Considering that the number of full-time teachers at the Department of Biological Sciences is already relatively low compared to international standards (the teacher-student ratio is around 1 to 30), it is evident that the Department of Biological Sciences is understaffed and needs more full-time academic staff members. In addition, more time is required for teaching additional practical laboratory work, and most importantly, for the supervision of mandatory research-oriented final projects."

#### **Response 9**

Formal documentation on initiating the hiring process for a full-time academic faculty member as early as February 2022 (beginning of the Spring 2022 Academic term) has been sent to the Rector's office on 1 November 2021 (**Attachment 4**).

#### Comment 10 (ASIIN Report Page 27)

" For example, a fluorescence-based flow cytometer must be added for single-cell analysis, a standard method in modern cell biology, neurology, and immunology labs."

#### Response 10

Preliminary assessment for equipment purchase has been done by the Department, and a potential technical requirements for the requested flow cytometer is shown in **Attachment 5**. This will be formally requested from the Rector's Office during the next laboratory budget availability.

#### Comment 11 (ASIIN Report Page 29)

"this is not the case in the Master's programme. The study plan is accessible here, but the module descriptions are not linked with the listed courses. Consequently, the peers require EMU to make the module descriptions of the master's programme available to all stakeholders, e.g., by publishing them on the programme's webpage. "

#### **Response 11**

Addition of the necessary information to the EMU website have been requested from the Director of EMU Information Technologies. However, since these changes are to affect all Master's program websites, they could not be implemented right away. We do have a response from the Director that the changes are now in process of being implemented (**Attachment 6**).

#### Comment 12 (ASIIN Report Page 29)

" Unfortunately, EMU could not provide a similar Diploma Supplement for the Master's programme Medical Biotechnology. For this reason, the peers expect EMU to draft a Diploma Supplement, similar to the one for the Bachelor's programme, and to hand it out to every student upon graduation."

#### Response 12

Under the supervision of the Rector's Office, Student Affairs Vice Rector, a diploma supplement has been designed (preliminary stage) and will soon be finalized and formally approved to be submitted to graduates of the Medical Biotechnology program. (**Attachment 1**).

#### Comment 13 (ASIIN Report Page 31)

" But they point out that it is also necessary to directly discuss the results of the satisfaction surveys. During the audit, students and graduates confirmed that they would like to see the direct consequences of the surveys. From the peers' point of view, it is necessary to close the feedback loops and actively involve the students in the quality assurance processes. This would motivate them to participate if changes and adjustments are directly visible to them and explain to them what consequences the surveys have."

#### **Response 13**

Departmental Board has decided to hold a specific Student Survey Outcomes Meeting at the end of each term and discuss the students' comments/suggestions/issues in general, following the usual Department Chair-Instructor meetings on the topic. Each instructor will then be responsible in conveying the expected changes regarding their courses to the students at the beginning of the term and then implementing the necessary revisions, whenever the given course if offered again.

#### **SECTION II**

#### ADDITIONAL POINTS MADE BY THE ASIIN TEAM

In addition to the above comments, certain additional comments presented in the report have been noted by the Departmental Board and the members are to strive to further improve the Department within these respects. Following are the key points; listed as headings based on the comments provided underneath, that the Departmental Board members take note on and will take action on.

#### 1) Industrial Cooperation

"Nevertheless, EMU and the Department of Biological Sciences should strive to cooperate with some companies; this would further promote the student's scientific education and offer them the opportunity to gain valuable practical experiences." (ASIIN Report Page 17)

#### 2) Student Exchange Programs

"..they encourage the Department of Biological Sciences to offer more opportunities for their students to spend some time during their studies abroad. Political issues should not hamper the development of research and academic exchange in science, and even more so when it concerns natural and medical sciences. A good starting point is the teachers' international connections; they could also be used for offering students the opportunity to conduct their final project at an international university." (ASIIN Report Page 17)

### 3) Involving Master's students in undergraduate teaching and supervision

"Master's and PhD students should be more involved in teaching and supervising Bachelor's students. This would also help reduce the teachers' workload and open up space for introducing a final project." (ASIIN Report Page 20)

#### 4) External collaborations for Project Supervisions

"Other possibilities are developing a joint thesis project that can be performed by several students as a group work and co-operating with other universities outside Cyprus and companies to find suitable topics for the final projects." (ASIIN Report Page 23)

#### 5) <u>Reorganizing Quiz content of courses</u>

" students think that two graded quizzes per course would be enough; otherwise, the number of exams (including mid-term and final exams) would be too high. In addition, the students criticise that the contribution of the quizzes to the final grade (30 %) is very high, and they would appreciate if the share would be reduced." (ASIIN Report Page 23)

#### **SECTION III**

#### COMMENTS BY THE ASIIN TEAM TO BE CONVEYED TO THE RECTOR'S OFFICE

Departmental Board takes note of the following topics/issues, raised by the ASIIN team, to be conveyed to the Rector's Office.

1) Transfer Policies

" The peers observe that EMU's transfer policies do not fully comply with the Lisbon Convention on recognizing qualifications. According to it, recognition of credits acquired outside EMU should be granted unless EMU proves substantial differences in the achieved competences. Currently, the Department and the Faculty Board have to agree with the learning agreement before the students go abroad, and the content of the course must be at least 80 % similar to the content of the course at EMU. EMU needs to establish a regulation that defines an adequate set of conditions for recognising credits acquired outside EMU, which are aligned with the Lisbon Convention. "(ASIIN Report Pages 17, 18.)

2) <u>Teaching Load</u>

" During the discussion with the auditors, the teachers pointed out that their teaching load is 12 hours per week. Therefore, they have only limited opportunities to follow their research interests at EMU during the semester. This is primarily due to their high teaching load, the limited laboratory space, which is primarily used for teaching, and, most importantly, the lack of research funding for consumables. Consequently, teachers usually conduct their research activities during the summer months and almost always depend on their international contacts. Based on the publication records in the teachers' CVs, the peers conclude that the scientific contribution of all teachers was very good; however, the output significantly decreased after they started working at EMU." (ASIIN Report Page 25)

3) <u>Sabbatical</u>

"In addition, there is no sabbatical possible for the teachers at EMU, and they can only apply for unpaid leave." (ASIIN Report Page 25)

#### 4) Department Funding

" In addition, EMU must consider that study programmes in biomedical sciences (e.g., at the Department of Biological Sciences) need more funds than other programmes because of expensive equipment and chemical and supplies for laboratory work. " (ASIIN Report Page 27)

#### 5) New Laboratory Space and Funding

" The peers strongly recommend that it is urgently necessary to open up a new laboratory - as intended by the Department of Biological Sciences. Currently, the different courses have to use the same biology laboratory; this laboratory is well equipped but only a limited number of workplaces are available."

"Since it is essential for students to gain sufficient practical experience in laboratory work, the peers also strongly recommend increasing the scope of practical laboratory work. Usually, students do the experiments together in groups of two to five students (depending on the course); however, there should be enough instruments and laboratory space (including fume hoods) to conduct the experiments by groups of two to a maximum of three students. Otherwise, students may not acquire the necessary hands-on experience in conducting experiments and in the responsible and safe use of chemicals." (ASIIN Report Page 27)

#### **SECTION IV**

#### **MINOR CLARIFICATIONS**

#### Departmental Board wishes to make the following explanations.

#### Comment 1 by ASIIN Team

" However, they point out that the grading system is different in other departments of EMU. For example, in the Department of Biological Sciences, it is necessary to get 90 % to receive an A; in other departments only 85 % are required. This seems unfair to the students, and it would be helpful to have the same grading scheme in every department. " (ASIIN Report Page 23)

#### **Clarification 1**

Curve system is applied, which could be perceived as different grading scales. This information will be made more clear to the students.

#### Comment 2 by ASIIN Team

" In addition, the peers point out that it is not clear how the students' representatives on the different boards are selected or chosen; this should be made transparent. Moreover, it would be useful to establish a speaker for each year and have them meet regularly and join the Faculty and Department Board." (ASIIN Report Page 23)

#### **Clarification 2**

For the Senate, student representative rules are stated (<u>http://mev-zuat.emu.edu.tr/Tuzukler/2-2 SenatoCalKararAlmaEsasl.htm</u>) in Turkish. However, these were not made available to the ASIIN team as the English versions are not available. ASIIN's suggestion will be conveyed to the Rector's office for the English version to be translated and

to be put on the related website. Similarly information of Departmental and Faculty Board student representative will be asked to be made more clear and visible, via communication with the Dean's and Rector's Office.

#### LIST OF ATTACHMENTS

- Attachment 1 Medical Biotechnology Master's Program Diploma Supplement
- Attachment 2 BIOL312 Bioinformatics and Computational Biology course outline
- Attachment 3 Formal request for hiring a Laboratory Manager
- Attachment 4 Formal request for hiring a full-time academic member
- Attachment 5 Flow Cytometer technical requirements
- Attachment 6 Communication with EMU Information Technologies for Website Changes

## F Summary: Peer recommendations (15.11.2021)

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Molecular Biology and Genetics	With requirements for one year	-	30.09.2027
Ma Medical Biotechnol- ogy	With requirements for one year	-	30.09.2027

The peers recommend the award of the seals as follows:

#### Requirements

#### For all degree programmes

- A 1. (ASIIN 5.2) The module descriptions need to include information about the students' total workload, and the awarded ECTS points.
- A 2. (ASIIN 5.3) Draft a guideline for recognising credits achieved outside EMU that is aligned with the Lisbon convention.
- A 3. (ASIIN 6) Close the feedback cycles and make sure that all teachers discuss with their students about the results of the questionnaires.

#### For the Bachelor's programme

- A 4. (ASIIN 1.4) Make the admission criteria for international applicants for the Bachelor's programme transparent.
- A 5. (ASIIN 1.3) Introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programme. The final project should introduce students to research activities and independent practical laboratory work.

#### For the Master's programme

A 6. (ASIIN 1.3) It is necessary to introduce compulsory advanced laboratory courses in order to impart the competencies that are necessary for conducting independent research activities and to introduce a compulsory final project (Master's thesis), which is research oriented.

- A 7. (ASIIN 5.1) Issue a Diploma Supplement to all graduates of the Master's programme.
- A 8. (ASIIN 5.3) Make the module descriptions available to all stakeholders, e.g. by publishing them on the programme's webpage.

#### Recommendations

#### For all degree programmes

- E 1. (ASIIN 4.1) It is recommend to provide more research opportunities for the teachers.
- E 2. (ASIIN 4.3) It is recommended to provide a budget for the Department of Biological Sciences for maintaining instruments and for purchasing essential chemicals and lab material on short notice.
- E 3. (ASIIN 4.3) It is recommended to increase the number of working places in the laboratories.

#### For the Bachelor's programme

- E 4. (ASIIN 4.3) It is strongly recommended to increase the scope of practical laboratory work and to provide enough technical equipment so that experiments can be done by groups of 2 to 3 students.
- E 5. (ASIIN 4.1) It is strongly recommended to increase the number of staff members who are able to supervise final projects/Bachelor's theses.
- E 6. (ASIIN 4.1) It is recommended to fill the vacant position of lab manager at the Department of Biological Sciences as soon as possible.

# G Comment of the Technical Committees (22.11.2021)

## Technical Committee 10 – Life Sciences (19.11.2021)

The procedure was carried out in September as a face-to-face procedure in Famagusta. The TC positively notes above all the satisfaction of the students, the high proportion of female lecturers, the small cohort sizes, the good IT equipment and the trusting relationship between students and lecturers.

The points of criticism relate to formal aspects (Diploma Supplement, module descriptions, Lisbon Convention) and above all to the lack of obligatory theses. Therefore, the TC propose an accreditation with eight requirements and a total of six recommendations. Only a minor rewording of requirement A 3 is proposed, otherwise, the Technical Committee agrees with the vote of the peer group.

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Molecular Biology and Genetics	With requirements for one year	-	30.09.2027
Ma Medical Biotechnol- ogy	With requirements for one year	-	30.09.2027

The Technical Committee 10 – Life Sciences recommends the award of the seals as follows:

## Technical Committee 14 – Medicine (22.11.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and emphasises that requirement A 6 is particularly serious for the Master's degree programme and that a rejection of accreditation is also possible if the corresponding improvements cannot be demonstrated within the course of fulfilling the requirements.

In summary, the Technical Committee agrees with the vote of the peer group.

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Molecular Biology and Genetics	With requirements for one year	-	30.09.2027
Ma Medical Biotechnol- ogy	With requirements for one year	-	30.09.2027

The Technical Committee 14 – Medicine recommends the award of the seals as follows:

# H Decision of the Accreditation Commission (07.12.2021)

#### Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discusses the procedure and the unusual political status of North Cyprus. The undefined status restricts the opportunities of the students and the teachers to take part at international programmes and hampers the university in hiring qualified teachers and purchasing chemicals. Under these difficult conditions, EMU is doing its best to offer solid scientific degree programmes and is successful to this respect. The Accreditation Commission stresses that it is essential to introduce compulsory final projects (Bachelor's and Master's thesis) in both programmes and that the necessary laboratory capacity and number of qualified teachers must be available. In summary, the AC follows the peers' assessment and the proposed changed wording of A 3.

The Accreditation Commission for Degree Programmes decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Molecular Biology and Genetics	With requirements for one year	-	30.09.2027
Ma Medical Biotechnology	With requirements for one year	-	30.09.2027

#### Requirements

#### For all degree programmes

- A 1. (ASIIN 5.2) The module descriptions need to include information about the students' total workload, and the awarded ECTS points.
- A 2. (ASIIN 5.3) Draft a guideline for recognising credits achieved outside EMU that is aligned with the Lisbon convention.
- A 3. (ASIIN 6) Close the feedback cycles and make sure that all teachers discuss the results of the questionnaires with their students.

#### For the Bachelor's programme

- A 4. (ASIIN 1.4) Make the admission criteria for international applicants for the Bachelor's programme transparent.
- A 5. (ASIIN 1.3) Introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programme. The final project should introduce students to research activities and independent practical laboratory work.

#### For the Master's programme

- A 6. (ASIIN 1.3) It is necessary to introduce compulsory advanced laboratory courses in order to impart the competencies that are necessary for conducting independent research activities and to introduce a compulsory final project (Master's thesis), which is research oriented.
- A 7. (ASIIN 5.1) Issue a Diploma Supplement to all graduates of the Master's programme.
- A 8. (ASIIN 5.3) Make the module descriptions available to all stakeholders, e.g. by publishing them on the programme's webpage.

#### Recommendations

#### For all degree programmes

- E 1. (ASIIN 4.1) It is recommended to provide more research opportunities for the teachers.
- E 2. (ASIIN 4.3) It is recommended to provide a budget for the Department of Biological Sciences for maintaining instruments and for purchasing essential chemicals and lab material on short notice.
- E 3. (ASIIN 4.3) It is recommended to increase the number of working places in the laboratories.

#### For the Bachelor's programme

- E 4. (ASIIN 4.3) It is strongly recommended to increase the scope of practical laboratory work and to provide enough technical equipment so that experiments can be done by groups of 2 to 3 students.
- E 5. (ASIIN 4.1) It is strongly recommended to increase the number of staff members who are able to supervise final projects/Bachelor's theses.

E 6. (ASIIN 4.1) It is recommended to fill the vacant position of lab manager at the Department of Biological Sciences as soon as possible.

## I Fulfilment of Requirements (09.12.2022)

## Analysis of the peers and the Technical Committees (02.12.2022)

#### Requirements

#### For all programmes

A 1. (ASIIN 5.2) The module descriptions need to include information about the students' total workload, and the awarded ECTS points.

Initial Treatment	Initial Treatment		
Peers	Fulfilled		
	Vote: unanimous		
	Justification: The module descriptions have been updated and		
	now include information about the students' total workload, and		
	the awarded ECTS points.		
TC 10	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC follows the peers' assessment.		
TC 14	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC agrees with the peers' opinion.		

A 2. (ASIIN 5.3) Draft a guideline for recognising credits achieved outside EMU that is aligned with the Lisbon convention.

Initial Treatment	Initial Treatment		
Peers	Fulfilled		
	Vote: unanimous		
	Justification: EMU will devise a guideline aligned with the Lisbon		
	Convention for recognising credits achieved outside of EMU. This		
	needs to be done by the higher administration of EMU. The De-		
	partment of Biological Sciences has taken the initiative to relay		
	this requirement to the EMU Rectorate via the Faculty of Arts		
	and Sciences Dean's Office.		
TC 10	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC follows the peers' assessment.		
TC 14	Fulfilled		
	Vote: unanimous/per majority		

#### Justification: The TC agrees with the peers' opinion.

A 3. (ASIIN 6) Close the feedback cycles and make sure that all teachers discuss the results of the questionnaires with their students.

Initial Treatment	Initial Treatment		
Peers Fulfilled			
	Vote: unanimous		
	Justification: Feedback from student surveys of the previous se-		
	mesters (i.e. starting from Fall 2021 Academic Term) has been		
	discussed by the teachers with the students. EMU has devised a		
	formal procedure how this is done.		
TC 10	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC follows the peers' assessment.		
TC 14	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC agrees with the peers' opinion.		

#### For the Bachelor's programme

A 4. (ASIIN 1.4) Make the admission criteria for international applicants for the Bachelor's programme transparent.

Initial Treatment	Initial Treatment		
Peers	Fulfilled		
	Vote: unanimous		
	Justification: The admission criteria for international students,		
	specified for each country, are now published in detail on EMU's		
	webpage.		
TC 10	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC follows the peers' assessment.		
TC 14	Fulfilled		
	Vote: unanimous/per majority		
	Justification: The TC agrees with the peers' opinion.		

A 5. (ASIIN 1.3) Introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programme. The final project should introduce students to research activities and independent practical laboratory work.

Initial Treatment	
Peers	Fulfilled
	Vote: unanimous

	Justification: EMU has introduced a graduation project with a to- tal scope of 12 ECTS points to the curriculum of the bachelor's programme. The new curriculum will be applied to incoming stu- dents with the start of the fall term 2022/23.
TC 10	Fulfilled
	Vote: unanimous/per majority
	Justification: The TC follows the peers' assessment.
TC 14	Fulfilled
	Vote: unanimous/per majority
	Justification: The TC agrees with the peers' opinion.

#### For the Master's programme

A 6. (ASIIN 1.3) It is necessary to introduce compulsory advanced laboratory courses in order to impart the competencies that are necessary for conducting independent research activities and to introduce a compulsory final project (Master's thesis), which is research oriented.

Initial Treatment	
Peers	Not fulfilled
	Vote: per majority
	Justification: The majority of the peers criticise that the Master's
	programme still does not include an experimental Master's the-
	sis. Such graduates will not be accepted to any PhD programmes
	in Europe. However, EMU has established a final project in the
	Master's programme within the new compulsory courses BIOL
	581 and 582. These two new courses are research courses,
	where the student carry out an individual wet-lab project under
	the supervision of a faculty member. This change is going to be
	applied to students with the start of the fall term 2022/23.
TC 10	Not fulfilled
	Vote: unanimous/per majority
	Justification: The TC follows the peers' assessment.
TC 14	Not fulfilled
	Vote: unanimous/per majority
	Justification: The TC agrees with the peers' opinion.

A 7. (ASIIN 5.1) Issue a Diploma Supplement to all graduates of the Master's programme.

Initial Treatment									
Peers	Fulfilled								
	Vote: unanimous								
	Justification: EMU now issues a Diploma Supplement, which is								
	aligned to the European template, to all graduates of the Mas-								
	ter's programme.								

TC 10	Fulfilled
	Vote: unanimous/per majority
	Justification: The TC follows the peers' assessment.
TC 14	Fulfilled
	Vote: unanimous/per majority
	Justification: The TC agrees with the peers' opinion.

A 8. (ASIIN 5.3) Make the module descriptions available to all stakeholders, e.g. by publishing them on the programme's webpage.

Initial Treatment	
Peers	Fulfilled
	Vote: unanimous
	Justification: The module descriptions are published on EMU's
	webpage.
TC 10	Fulfilled
	Vote: unanimous/per majority
	Justification: The TC follows the peers' assessment.
TC 14	Fulfilled
	Vote: unanimous/per majority
	Justification: The TC agrees with the peers' opinion.

## Decision of the Accreditation Commission (09.12.2022)

The AC discusses the procedure and decides that all requirements with the exception of A6 for the Master's degree programme Medical Biotechnology are fulfilled.

The AC criticises that the Master's programme still does not include an experimental Master's thesis. Such graduates will not be accepted to any PhD programmes in Europe. However, EMU has established a final project in the Master's programme within the new compulsory courses BIOL 581 and 582. The AC expects EMU to increase the scope of the final project and its research orientation.

Degree Programme	ASIIN seal	Subject-specific la- bels	Maximum duration of accreditation
Ba Molecular Biology and Genetics	All requirements ful- filled	-	30.09.2027
Ma Medical Biotech- nology	Requirement A6 not fulfilled	-	prolongation for six months

The Accreditation Commission decides to award the following seals:

## J Fulfilment of Requirements (23.06.2023)

## Analysis of the peers and the Technical Committees (12.06.2023)

#### Requirements

#### For the Master's programme

A 6. (ASIIN 1.3) It is necessary to introduce compulsory advanced laboratory courses in order to impart the competencies that are necessary for conducting independent research activities and to introduce a compulsory final project (Master's thesis), which is research oriented.

Initial Treatment	
Peers	Not fulfilled
	Vote: per majority
	Justification: The majority of the peers criticise that the Master's
	programme still does not include an experimental Master's the-
	sis. Such graduates will not be accepted to any PhD programmes
	in Europe. However, EMU has established a final project in the
	Master's programme within the new compulsory courses BIOL
	581 and 582. These two new courses are research courses,
	where the student carry out an individual wet-lab project under
	the supervision of a faculty member. This change is going to be
	applied to students with the start of the fall term 2022/23.
TC 10	Not fulfilled
	Vote: unanimous
	Justification: The TC follows the peers' assessment.
TC 14	Not fulfilled
	Vote: unanimous/per majority
	Justification: The TC agrees with the peers' opinion.
AC	not fulfilled
	Vote: unanimous

	Justification: The AC criticises that the Master's programme still does not include an experimental Master's thesis. Such graduates will not be accepted to any PhD programmes in Europe. How- ever, EMU has established a final project in the Master's pro- gramme within the new compulsory courses BIOL 581 and 582. The AC expects EMU to increase the scope of the final project and its research orientation.
Second Treatmen	nt
Peers	Fulfilled Vote: per majority Justification: The peers acknowledge that EMU has already im- plemented a final project with research aspects in the Master's programme. Thus, the formal requirements set by ASIIN are ful- filled. However, one peer still has doubts because the pro- gramme does not include a "real" Master's thesis. When EMU graduates apply for PhD positions, you have to look closely at the transcript so that you can recognize the practical thesis as such.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees with the majority opinion of the expert group and considers the requirement as fulfilled.
TC 14	Fulfilled Vote: unanimous Justification: The TC agrees with the majority opinion of the expert group and considers the requirement as fulfilled.

## Decision of the Accreditation Commission (23.06.2023)

The AC decides that all requirements are fulfilled.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN seal	Subject-specific la- bels	Maximum duration of accreditation
Ma Medical Biotech- nology	All requirements ful- filled	-	30.09.2027

## **Appendix: Programme Learning Outcomes and Curricula**

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the <u>Bachelor's degree programme Molecular Biology and Genetics</u>:

	-						-								-				-							
Objectives - Module Matrix	Module Names	BIOL121 - General Biology - I	BIOL122 - General Biology - II	BIOL 124 - Introduction to Molecular Biology and Genetics	BIOL211 - Molecular Cell Biology - I	BIOL212 - Molecular Cell Biology - II	BIOL213 - Human Genetics	BIOL216 - Cellular and Molecular Physiology	BIOL311 - Molecular Genetics	BIOL312 - Bioinformatics and Computational Biology	BIOL315 - Behavioral Genetics	BIOL317 - Neurogenetics	BIOL320 * Biochemistry	BIOL411 - Molecular Evolution	BIOL412 - Immunology	BIOL413 - Developmental Biology	BIOL414 - Systems Biology	BIOL415 - Genomics and Proteomics	BIOL416 - Bioethics of Genetics and Genomics	BIOL417- Microbiology	BIOL420 – Genetics and Personalized Medicine	BIOL426 - Reproductive Biology	BIOL432 – Marine Biology	BIOL434 - Advanced Molecular Biotechnology	BIOL456 - Stem Cell Biology	BIOL460 - Forensic Genetics
Deservery Objectives	<u> </u>					<u> </u>	<u> </u>		<u> </u>																<u> </u>	
Lederstand the scientific method	<u> </u>																								⊢	
Orderstand the scientific method		X	х																							
Understand molecules structure and function		х	х	x	x	x			х				x												1	
Describe general properties of cells		х	х		X	x		х					x							x						
Articulate the basic concepts in genetics				х			х		х		X	X									x					
Identify the basic molecular structure of DNA				х	х	X	х		х				X													
Understand the evolutionary processes		х	х											х		х	X	x								
Understand evolution of development		х	х											х		х										
Describe the diversity of life		х	х																	X			х			
Identify the main groups of organisms		х	х																	x						$\square$
Describe the chromosomal organization of genetic material				x	x	x	x		x									X								
Describe the structure, function and division of cells in general				x	x	x	x		x																	
Explain transmission of genetic material - Understand transcription, translation, and control of gene expression				x	x	x	x	x	x		x	x									x					
The use of DNA and its applications in forensic genetics				x																				x		x

Articulate the role of molecular genetics in modern day biotechnology			x																			x	x
Understand genetic variation and its relationship to human disease			x			x		x		x	x						x			x	x		
Understand the fundamentals of molecular biology and genetics.	x	x	x	x	x	x	x	x				x			x								
Account for the universal features of cells and their chemical components.	x	x		x	x							x							x				
Describe the genetic information flow in the cell, such as the fundamentals of DNA, chromosomes and genomes; DNA replication, repair and recombination; transcription (from DNA to RNA); translation (from RNA to DNA), and regulation of gene expression.			x	x	x	x	x	x							x								
Define the basics of the cell cycle and how it is controlled.				x	x	x	x	x															
Understand different techniques used to analyze and visualize cells	x	x	x	x	x		x								x				x				
Grasp different techniques used to analyze molecules			x	x	x		x	x	x					x		X	X		x				
Understand intracellular compartments and trafficking				x	x		x	x															
Learn the details of cell death and its molecular regulation				x	x		x	x															
Learn the molecular and cellular basis of cancer			x	x	x	x	x	x												x			
Identify the basic chromosomal structure of the human genome			x	x	x			x									x						
Describe single-gene inheritance and diseases			x			x		x		x	x									x			
Describe multi-gene inheritance and diseases			x			x		x		x	x						X			x			
Explain alleles and allelic frequencies						x							x										
Explore in detail ethical, legal and social issues relevant to the field																		x		x	x		
Emphasize the importance of physiology in the field of molecular biology and genetics.						x																	

Explain the basic terms and principles about cellular physiology.					x																			
Explain the central physiological principle of homeostasis					x																			
Describe the basic physiological functions of the cells.					x																			
Navigate through basic bioinformatics databases								x								X								
Access and utilize relevant biological data including DNA, RNA, and protein data.								x								x								
Gain hands-on bioinformatics skills.								x								X								
Describe complex etiology of behavioral disorders		x			x		x		x															
Explain different epigenetic mechanisms					х		х		x	x						х			x	x				
Follow contemporary literature in fields relevant to molecular biology and genetics			x	x	x	x	x	x	x	x		x	x	x	X	x	x	x	x	X	x	x	x	X
Describe genome-wide methodology including GWAS and EWAS								x	x	x						x			x					
Structures, chemistries, and properties of the four major molecules of life (proteins, lipids, carbohydrates, and nucleic acids).											x													
Describe functions of enzymes in biological reactions, identify the various types of enzymes, the relationship of the structure of an enzyme to its function and various types of enzyme inhibition (different effects of 'competitive' inhibitors, 'non-competitive' inhibitors, and allosteric' inhibitors on enzyme kinetic parameters).											x													
Biochemical roles of vitamins, enzyme cofactors, and hormones.											X													
Central energy metabolism as well as the basic chemical properties that underlie these processes.											X													
The mechanisms of regulation of metabolic processes.						x					x													
The interdependent relationship between enzyme catalysis, metabolism, regulation and						x					x													

their importance to the physiological condition of an organism.																								
Articulate the basic concepts in evolutionary theory and population genetics		x										x												
Understand and describe the main principles and processes in molecular evolution												x												
Interpret and discuss scientific papers in the field	F		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Emphasize the importance of immunology in the field of molecular biology and genetics													x											
Explain the basic terms and principles about immunology													x											
Describe the cells of immunity, lymphoid organs and discuss about the generation and differentiation of immune cells in primary and secondary lymphoid organs													x											
Describe the natural, cellular and humoral immunity mechanisms and their protective roles in infectious diseases													x					x						
Explain the basic molecular genetic mechanisms of high genetic variety in adaptive immune response							x						x											
Define the reasons for immunodeficiency and autoimmune diseases and should relate molecular genetic mechanisms of immunotherapeutic generation to these diseases							x						x											
Relate the monoclonal antibodies to methods in molecular biology and drug industry.													x											
Express the use of main immunological laboratory tests in molecular biology and pharmaceutical industry.													x											
Understand the biology of the developing embryo														x										
Describe the processes during embryonic growth														x										
Learn about the cell-cell communication in development				x										x										
Have the basic concepts on sex determination in species														x										

Articulate the basic concepts in Systems Biology												X							
Be able to analyze modelled networks							x					x							
Have an understanding of the software and databases used in Systems Biology							x					x							
Use specific bioinformatics databases to access genomics and proteomics information.							x						X						
Access and utilize relevant biological data including genome sequences, protein structures, functions and relevant metabolic pathways.							x						x						
Gain knowledge about mapping and sequencing techniques involving NGS and recent developments such as exome and RNA-seq.							x						x						
Compare genomic information across different species.							x			x			x		X				
Learn about variant calling in high-throughput sequence analysis.							x						x						
Understand the scope of new fields including cancer genomics, epigenomics, pharmacogenomics and nutrigenomics.													x						
Understand the basic problems, methods, and approaches to the field of bioethics														x					
Engage in the critical analysis of bioethical questions and articulate their theoretical and practical dimension														X					
Discuss and form opinions about the ethical, legal and social issues in genetics and genomics			x		x			x	x					x		x			
Identify and critically evaluate the bioethical issues that arise in genetic research and in clinical genetics								x	x					x		x			
Understand the biology of microorganisms	x	x													X				
Describe the origins of microbial life	x	x													x				
Learn about the growth of microbial organisms															x				
Learn about viruses and their replication	x	х													X				

Learn shout misrehial diseases	<b></b>	· · · ·	1	T	T	· · · ·	· · · ·	 <b></b>			 · · · ·	<u> </u>	· · · ·		<u> </u>	v	· · · · ·	· · · ·	· · · · ·	<u> </u>	<u> </u>	<u> </u>
Learn about microbial diseases													x			×						
Describe host defense mechanisms against microbial infections													x			x						
Explain DNA analysis & discuss the importance of whole genome sequencing and exome sequencing									x	x												
Explain importance of variations in terms of personalized medicine								x	x	x				x			x					
Discuss pharmacogenetic tests and clinical utility			x						x	x					X		x					
Discuss the use of treatment stratification and rational drug design for patients																	x			X		
Explain non-genomic factors that affect inter- individual variations																	x					
Discuss the importance of the move from the current reactive "diagnose and treat" system to a proactive "predict and prevent" system																	x					
Understand the basic anatomy of male and female reproductive systems						x												x				
Articulate gonadal function, gametogenesis and fertilization						x												x				
Understand the aspects of pregnancy, contraception and STDs																		x				
Have an understanding of nutritional and immunological factors in pregnancy																		x				
Understand the concepts of assisted reproductive techniques, pre-implantation genetic diagnosis						x												x				
Demonstrate current ethical issues and concerns in Reproductive Medicine.						x									x			x				
Understand the coverage of marine biology with its history, sub disciplines and future prospects																			x			
Describe the methods used in marine biology																			x			
Describe the life zones in the marine environment																			x			
Understand the relationships in marine life																			x			

	-	_	 			-	-		-	 	-		-	 	 -	 -	-	_		
Understand the basic molecular biology laboratory techniques			x	x	x		x	x				x								
Have an understanding of advanced methodology used in DNA, RNA and protein analysis.							x	x			x	x								
Know about the recent developments in the field of molecular biotechnology							x	x								x		x		
Understand the description, general properties and the types of stem cells			x	x	x														X	
Describe different types of stem cells; their sources, properties and applications in regenerative medicine				x	x														X	
Define the characteristics of stem cell niches																			x	
Understand the biology of inducible pluripotent stem cells																			X	

The following **curriculum** is presented:

	Crs. Code	Course Name	Credits	ECTs
First Semes	ster			
	ENGL191	Communication in English - I	3	5
	HIST280 /	History of Turkish Reforms/	2	5
	TUSL191	Communication in Turkish	2	5
	MATH150	Calculus with Pre-calculus	4	6
	BIOL121	General Biology - I	4	6
	CHEM111	General Chemistry - I	4	6
Second Sen	nester			
	CHEM112	General Chemistry - II	4	6
	BIOL124	Introduction to Molecular Biology and Genetics	3	6
	ENGL192	Communication in English - II	3	5
	MATH152	Calculus - II	4	6
	BIOL122	General Biology - II	4	6
Third Seme	ster			
	BIOL211	Molecular Cell Biology - I	4	6
	PHYS101	Physics - I	4	7
	COMP183	Introduction to Computer Science - I	4	6
	BIOL213	Human Genetics	3	6
	CHEM243	Organic Chemistry - I	4	6
Fourth Sem	ester			
	BIOL212	Molecular Cell Biology - II	4	7
	PHYS102	Physics - II	4	7
	COMP184	Introduction to Computer Science - II	4	6
	BIOL216	Cellular and Molecular Physiology	4	6
	CHEM244	Organic Chemistry - II	4	6

Fifth Semes	ster			
	COMP374	Database Management Systems	3	6
	BIOL311	Molecular Genetics	4	8
	UE01	University Elective - I	3	5
	AE01	Area Elective - I	3	5
	BIOL315	Behavioral Genetics	3	8
Sixth Seme	ster			
	BIOL320	Principles of Biochemistry	4	6
	BIOL312	Bioinformatics and Computational Biology	3	6
	UE02	University Elective - II	3	5
	MATH212	Biostatistics	3	6
	BIOL317	Neurogenetics	3	7
Seventh Se	mester			
	BIOL413	Developmental Biology	4	6
	BIOL415	Genomics and Proteomics	3	7
	AE02	Area Elective - II	3	5
	BIOL417	Microbiology	4	7
	BIOL411	Molecular Evolution	3	6
Eighth Sem	ester			
	UE03	University Elective - III	3	5
	AE03	Area Elective - 🎹	3	5
	BIOL416	Bioethics of Genetics and Genomics	3	5
	BIOL412	Immunology	4	6
	BIOL414	System Biology	3	6
Total			139	240

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the <u>Master's degree programme Chemical Engineering</u>:

Objectives - Module Matrix	Module Names	BIOL501 - Molecular Biology and Genetics	BIOL502 - Fundamentals of Biotechnology	BIOL503 - Genome Editing and Gene Therapy	BIOL504 - Advanced Molecular Cell Biology	BIOL506 - Molecular and Medical Biotechnology	BIOL507 - Medical Biotechnology in Diagnostics and Therapeutics	BIOL508 - Biomarkers and Drug Development	BIOL509 - Applications of Biotechnology in Assisted Reproduction	BIOL511 - Ethics in Biotechnology	BIOL513 - Epigenetics and Epigenomics	BIOL515 - Applications of Biotechnology in Marine Biology	BIOL521 - Molecular Biotechnology Laboratory Applications
Programme Objectives													
Understand and build on the basics of eukaryotic gene expression / human genome and gene expression		Х		Х	Х	Х	Х				Х		
Learn about genes and genomics as well as proteins		X		X	Х	X					Х		
Learn about eukaryotic genome, transcriptome and proteome		x		x	Х						Х		
Understand the definition, types and principles of biotechnology.			х				Х						
Describe cellular processes		х			Х								
Understand the Recombinant DNA technology.			Х			Х							Х
Explore specific areas of medical biotechnology in detail						X	х	Х	х				
Describe the main features of the human genome		Х		Х									
Explain different genome editing mechanisms				X									
Follow contemporary literature in the fields related to medical biotechnology in specific and biotechnology in general		X	X	x	x	x	x	x	x	X	X	х	X
Discuss ethical, legal and social issues (ELSI) relevant to the field of medical biotechnology				Х				Х	х	Х			
Appreciate the diagnostic and therapeutic purposes of medical biotechnology.						X	х	x					

Learn about wide variety of diagnostic and therapeutic tools developed by the biotechnology industry.		х				Х	Х	х				
Understand the mechanisms of disease therapeutics and diagnostic tools.		х				х	Х	х				
Understand the methods used to produce molecular therapeutic and diagnostic tools.		х	Х			Х	Х	Х		Х		Х
Explain the biomarker types and applications used in biomedical research							Х					
Explain applications and limitations of biomarkers in disease diagnosis, prognosis and drug discovery							Х					
Explain the use biomarkers in cancer disease prediction and drug development						Х	Х					
Describe the strategy towards and steps during drug development						Х	Х					
Describe the main features of the human epigenome										Х		
Explain different epigenetic mechanisms	Х		X							Х		
Understand the importance of epigenetics in human disease	Х		Х			х		х		Х		
Explore different fields of biotechnology			Х		Х	Х	Х		Х		х	
Learn about wide variety of products/tools developed by and used in different biotechnology industries								Х			х	Х
Conduct experiments in a safe and responsible manner.									Х			Х
Literature Search	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Scientific writing	Х	Х	X	X	X	х	Х	X	Х	Х	X	Х
Learn to isolate plasmid DNA, perform restriction digestion and analyze the digest fragments by agarose gel electrophoresis												х
Understand the basics of polymerase chain reaction	Х											Х
Application of medical biotechnology to different kind of human diseases			X			Х	Х	Х		Х		

The following curriculum is presented:

Course Code	Course Name
	Core Courses
BIOL599	Term Project
BIOL501	Molecular Biology and Genetics
BIOL502	Fundamentals of Biotechnology
	Elective Courses
BIOL503	Genome Editing and Gene Therapy
BIOL504	Advanced Molecular Cell Biology
BIOL506	Molecular and Medical Biotechnology
BIOL507	Medical Biotechnology in Diagnostics and Therapeutics
BIOL508	Biomarkers and Drug Development
BIOL509	Applications of Biotechnology in Assisted Reproduction
BIOL511	Ethics in Biotechnology
BIOL515	Applications of Biotechnology in Marine Biology
BIOL521	Molecular Biotechnology Laboratory Applications
GRAD501	Graduate Research Skills in Science and Engineering
	Note: Electives offered until Spring 2021 have been listed above.
	Electives available in the curriculum that might be offered in the upcoming terms.
BIOL512	Vaccines and Immunity
BIOL514	Applications of Bioinformatics in Biotechnology