ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Environmental Biology
Biotechnology

Master's Degree Programme
Biology

Provided by
Sultan Qaboos University, Oman

Version: 22 March 2024

Table of Content

A About the Accreditation Process 3

B Characteristics of the Degree Programmes 5

C Expert Report for the ASIIN Seal 8

1. The Degree Programme: Concept, content & implementation 8
2. Exams: System, concept and organisation 24
3. Resources 27
4. Transparency and documentation 33
5. Quality management: quality assessment and development 35

D Additional Documents 39

E Comment of the Higher Education Institution (12.01.2024) 40

F Summary: Expert recommendations (29.01.2024) 49

G Comment of the Technical Committees (14.03.20249 51

H Decision of the Accreditation Commission (22.03.2024) 53

Appendix: Programme Learning Outcomes and Curricula 55

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Bachelor's programme in Environmental Biology	-	ASIIN	ASIIN 11.12 2015 - 30.09.2021	10
Bachelor's programme in Biotechnology	-	ASIIN	ASIIN 11.12 2015 - 30.09.2021	10
Master's programme in Biology	-	ASIIN	-	10
Date of the contract: 06.02.2023 **Submission of the final version of the self-assessment report:** 13.10.2023 **Date of the audit:** 14.11. – 16.11.2023				
Expert panel: Prof. Dr. Carmen Genning, Ostfalia University of Applied Sciences Sabine Huck, Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, Berlin Prof. Dr. Matthias Mack, University of Applied Sciences Mannheim Ass. Prof. Dr. Yasmine Souissi, German University of Technology in Oman Saja Bahwan Al Mukhaini, German University of Technology in Oman, student				
Representative of the ASIIN headquarter: Rainer Arnold				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 10 – Life Sciences

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 (original)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor's programme in Environmental Biology	Bachelor of Science in Environmental Biology	-	6	Full time	no	8 Semester	122 Omani Credits/ 244 ECTS	Fall Semester, 2014
Bachelor's programme in Biotechnology	Bachelor of Science in Biotechnology	-	6	Full time	no	8 Semester	122 Omani Credits/ 244 ECTS	Fall Semester, 2014
Master' programme in Biology	Master of Science in Biology	-		Full time/Part time	no	4 Semester (full time) 6 Semester (part time)	24 Omani Credits/ 60 ECTS	Fall Semester, 2020

[3] EQF = The European Qualifications Framework for lifelong learning

For the Bachelor's degree programmes Biotechnology and Environmental Biology, Sultan Qaboos University has presented the following general aims in the Self-Assessment Report:

College Student Attributes

A. Science graduate should be able to

1. Apply the knowledge and skills relevant to science
2. Communicate effectively and use information and communication technologies
3. Critically analyze complex information and present it in simple legible manner.

B. Science graduate possess

1. Personal skills and alignment with culture of international labour market to assist them in practical life and in living successfully.
2. Skills and motivation to independent learning and engagement in lifelong learning and research.
3. Work ethics and positive values, and enjoy intellectual independence and autonomy.
4. Teamwork skills and display potential leadership qualities.

C. Science graduates should relish good citizenship qualities, conscious of their national identity and social responsibility, engage in community affairs and mindful of contemporary issues.

Department of Biology Program Outcomes

PEO1. Be able to demonstrate their knowledge in general biological concepts as well as knowledge in the area of specialization.

PEO2. Be aware of contemporary issues able to apply knowledge and skills to investigate and solve problems related to their specialization.

PEO3. Be able to communicate (verbally or in writing) their biological knowledge to various levels of audience with regard to the field of specialization.

PEO4. Demonstrate high level of ethical and social conduct in the practice of their profession and awareness of occupational health and safety issues related to the workplace.

PEO5. Be able to learn independently and become a lifelong learner.

PEO6. Be able to work well independently and/or in a team.

PEO7. Be able to engage in supporting community affairs relevant to their specialization

For the Master's degree programme Biology, Sultan Qaboos University has presented the following profile in the Self-Assessment Report:

"The M.Sc. program in Biology at Sultan Qaboos University provides an opportunity for students to learn about the processes of plants, animals and microorganisms and their diversity and conservation. Furthermore, the program provides opportunities to join multi-disciplinary teams in research and training in a large suite of molecular and analytical techniques. The M.Sc. program at SQU prepares students for careers in biotechnology fields and to further their education in advanced post-graduate studies and/or professional schools. Completion of the M.Sc. courses and the one-year research project provide students with fundamental science skills and a deep understanding of the biological principles, scientific thinking, research methods, safety, ethic and technical experience required to pursue their career in research and industry."

C Expert 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:

- Self-Assessment Reports
- Study plans
- Module descriptions
- Webpage SQU: https://www.squ.edu.om
- Webpage Department of Biology: https://www.squ.edu.om/science/Departments/Biology
- Webpage Ba Biotechnology: https://www.squ.edu.om/science/Departments/Biology/BSc-in-Biotechnology
- Webpage Ba Environmental Biology: https://www.squ.edu.om/science/Departments/Biology/BSc-in-Environmental-Biology
- Webpage Ma Biology: https://www.squ.edu.om/science/Departments/Biology/Postgraduate
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts base their assessment of the learning outcomes as provided on the websites and in the Self-Assessment Report of the three degree programmes under review.

For all three programmes, Sultan Qaboos University has described Programme Educational Objectives (PEO) and Programme Learning Outcomes (PLO). While the PEO are rather general and refer to the vision and mission of the College of Science, the PLO cover several specific competences students should acquire in their respective degree programme.

The experts 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 Bachelor's de-

gree programmes Biotechnology and Environmental Biology, as well as of the Master's degree programme Biology as defined by SQU, correspond with the competences as outlined by the SSC. They come to the following conclusions:

Graduates of the Bachelor's degree programme Biotechnology should understand general biology as well as in biotechnology concepts and have the necessary scientific and technical knowledge and skills, which are required to work in a laboratory and to conduct research activities in biotechnology. This includes designing and conducting experiments, as well as analysing and interpreting data. Compared to other, purely natural science degree courses, biotechnology courses have a significantly higher proportion of engineering modules (e.g. process engineering, measurement and control technology, bioreactors, processing methods etc.). Additionally, they should understand and be able to solve problems related to their specialisation by critically and independently applying scientific thinking and methods. Moreover, students should learn to communicate (verbally or in writing) their knowledge to various levels of audience with regard to the field of biotechnology. Finally, graduates should demonstrate awareness of occupational health and safety issues as they relate to the workplace, display a high level of ethical conduct in the practice of their profession, and have the ability to work independently and in a team.

The programme's educational objectives and learning outcomes are expected to equip the graduates with life skills required to develop and adapt to the wide spectrum of possible occupations in areas such as modern agriculture, biomedicine, biotechnology, and (bio)pharmaceutical industries. The experts learn that graduates of the Bachelor's degree programme Biotechnology have only limited job perspectives, as the pharmaceutical and biotechnology industry is not well developed in Oman yet. Therefore, several graduates work as teachers in high school but most find more or less adequate jobs in the public sector (e.g. ministries, laboratories). For this reason, the experts strongly support the plans of the programme coordinators to introduce an additional minor in medical biotechnology to the curriculum of the Bachelor's degree programme Biotechnology. As alumni confirm, this area offers more job opportunities.

Students of the Bachelor's degree programme Environmental Biology should acquire a sound knowledge of the fundamental concepts and theories of biology and their application to ecology and environmental sciences as well as of major environmental challenges from a local to a global perspective. Furthermore, graduates should also be able to carry out practical work in laboratories and to design and perform experiments. They also should be familiar with modern experimental methods of biology, have a sound knowledge of safety and environmental issues, and be able to interpret, critically assess, present, and communicate relevant information and new research results, and to discuss them with specialist colleagues. Moreover, the graduates should be capable of using the acquired

knowledge and skills to find solutions to practical biological and environmental problems and for conducting scientific work. Additionally, they should be familiar with environmental hazards and problems that are relevant for the community and be able to apply appropriate means to solve these problems. Finally, they should demonstrate awareness of occupational health and safety issues as they relate to the workplace, display a high level of ethical conduct in the practice of their profession, and have the ability to work independently and in a team.

Graduates of the Bachelor's degree programme Environmental Biology have several job opportunities. They can work in petrochemical and gas companies, mining industries, environmental research and monitoring institutions, public agencies, and educational institutions by becoming teachers or lecturers.

Graduates of the Master's degree programme Biology should demonstrate a deep understanding of foundational theories in biology, enabling them to independently design and execute practical and applied research projects in diverse biological fields. Additionally, they should possess advanced skills in experimentation, observation, data collection, analysis, and interpretation, to be able of effectively addressing complex research questions in biology. This includes gaining expertise in their chosen field of specialisation, independently identify emerging areas of investigation within the field of biology, and being able to complete an advanced research project, thereby paving the way for the exploration of new research avenues and contributing to the advancement of biological sciences. Finally, they should be able of proficiently communicating scientific findings both in writing reports and orally, catering to a wide audience, including experts, and the broader society, thus promoting scientific education and understanding.

Graduates of the Master's degree programme Biology can find suitable jobs in various areas such as biotechnological and biochemical laboratories and companies, food production and safety, agriculture, healthcare and medical institutions, environmental organisations and monitoring services, consulting services, and scientific organisations and research institutes.

In summary, the experts are convinced that the intended qualification profiles of the three programmes under review allow students to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the goals set for them.

The experts conclude that the objectives and intended learning outcomes of the Bachelor's degree programmes Biotechnology and Environmental Biology as well as of the Master's degree programme Biology adequately reflect the intended level of academic qualification

(EQF 6 for the Bachelor's programme and EQF 7 for the Master's programme) and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Reports
- Study plans

Preliminary assessment and analysis of the experts:
Sultan Qaboos University awards a Bachelor of Science (B.Sc.) to the graduates of the Bachelor's degree programmes Biotechnology and Environmental Biology, and a Master of Science (M.Sc) to the graduates of the Master's degree programme Biology.

The experts confirm that the names of both Bachelor's degree programmes appropriately reflect the focus and content of the respective programme.

With respect to the Master's degree programme Biology, the experts point out that from their point of view the programme's content is more similar to a biotechnology programme than a general biology programme. Thus, the Department of Biology should think about renaming the programme.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Reports
- Study plans
- Module descriptions
- Webpage SQU: https://www.squ.edu.om
- Webpage Department of Biology: https://www.squ.edu.om/science/Departments/Biology
- Webpage Ba Biotechnology: https://www.squ.edu.om/science/Departments/Biology/BSc-in-Biotechnology
- Webpage Ba Environmental Biology: https://www.squ.edu.om/science/Departments/Biology/BSc-in-Environmental-Biology

- Webpage Ma Biology: https://www.squ.edu.om/science/Departments/Biology/Postgraduate
- Discussions during the audit

Preliminary assessment and analysis of the experts:
All three programmes under review are offered by the Department of Biology, which is part of the College of Science of Sultan Qaboos University.

The Bachelor's degree programmes Biotechnology and Environmental Biology are designed for four years and are offered as full time programmes. In both programmes, 122 Omani credits (CR) need to be achieved by the students (this is equivalent to 244 ECTS points).The Master's degree programme Biology is offered as a fulltime programme (four semesters) and as a part time programme (six semesters). The programme encompasses 23 Omani credits (this is equivalent to 60 ECTS points). Each semester is equivalent to 15 weeks of learning activities. Besides these learning activities, there is one week for final exams.

All new students that want to enter the College of Science at SQU must start with the "Foundation Programme", which is designed for two semesters and has the goal of preparing the new students, who have been accepted to study at SQU, to achieve the required competences to enter a Bachelor's degree programme. The "Foundation Programme" includes courses in English, mathematics, sciences, information technology, and general skills. After successfully completing the "Foundation Programme", students can select a major (e.g. biology, chemistry, physics) and begin the Bachelor's degree programme. Since all classes are taught in English, every student spends his first two semesters on learning English, before he can choose a major and start his education at the College of Science.

The curricula of the Bachelor's degree programmes Biotechnology and Environmental Biology consist of elective and compulsory courses determined by SQU, the College of Science, and the Department of Biology. University requirements are courses that need to be attended by all undergraduate students at SQU. The university requirements include courses such as "Omani Contemporary Society, "Arabic", an "Oman & Islamic Civilization or Islamic Culture". The only college requirement is the courses "Communication in Science". These courses are almost all offered in the first two semesters of studies, in addition to courses conveying general knowledge of chemistry and biology). Courses on the different subject-specific topics are offered from third to eighth semester. The general structure of the Bachelor's degree programme Biotechnology is shown in the following table:

Categories	CR
University Requirements (UR)	6
University Electives (UE)	6
College Requirement (CR)	3
College Electives (CE)	16
Departmental Requirements (DR)	24
Major Requirements (AR)	37
Major Electives (AE)	30
TOTAL	**122**

Table 1: Structure Ba Biotechnology, Source: SAR SQU

The complete list of all compulsory and elective modules can be found in the curricular overview of the Bachelor degree programme Biotechnology.

The general structure of the Bachelor's degree programme Environmental Biology is shown in the following table:

Categories	CR
University Requirements (UR)	6
University Electives (UE)	6
College Requirement (CR)	3
College Electives (C	16
Departmental Requirements (DR)	24
Major Requirements (AR)	43
Major Electives (AE)	24
TOTAL	**122**

Table 2: Structure Ba Environmental Biology, Source: SAR SQU

The complete list of all compulsory and elective modules can be found in the curricular overview of the Bachelor degree programme Environmental Biology.

The experts especially appreciate that all classes are taught in English, which increases the job opportunities of the graduates and enables them to pursue their studies abroad. They learn that the degree plans are reviewed every five years by the curriculum committee, which adds and removes courses.

The experts notice that all courses include practical training in a laboratory. The laboratories are supervised by technical assistants and the responsible professor. This direct contact is very useful to the students, because they learn to work in teams and to discuss scientific topics with experts and fellow students. Integrated modules with practical courses and lectures also offer the possibility to synchronize theory and practice.

The curriculum of the Master's degree programme Biology includes compulsory core courses (21 CR) that the student must take and elective courses (9 CR). Students spend the

first year taking their compulsory and elective courses and the second year working on their thesis. There are five compulsory courses with three CR each: “Biological Instrumentation and Analysis”, “Multiomics”, “Bioproducts and Bioeconomy”, “Biostatistics”, and “Scientific communications”. In addition, students have to complete a Master’s thesis (6 CR).

Major changes in the degree programmes are implemented in a five-year cycle. For example, based on the recommendations of the alumni, waste management was changed from an elective to a compulsory course in environmental biology. An important development in the Bachelor’s programmes was the introduction of a compulsory graduation project in the Bachelor’s degree programmes. This was required by the first international accreditation of the programmes. In addition, a course in tissue has been removed from the curricula and on the other hand, courses in culture plant biotechnology and environmental biotechnology have been added, and bioinformatics is now a compulsory course.

An important topic, which the experts discuss during the audit with programme coordinators, teachers, students, and stakeholders (alumni, employers), is the fact that the study plans of both Bachelor’s programmes do not include an internship (work practise). The experts point out that it is very useful for students to conduct an internship during their Bachelor’s studies. For example, internships provide valuable practical experience in a professional setting, which allow students to apply what they have learned in the classroom to actual work situations, thereby gaining insight into how theories and concepts translate into practice. Additionally, internships offer opportunities to develop and enhance various soft/social skills, including communication, teamwork, problem-solving, and time management. Finally, they offer a chance for students to explore different career paths and make contact with possible employers. This can significantly enhance a student's job prospects after graduation, as employers often prefer hiring students with whom they have had positive internship experiences, as they are already familiar with their work ethic and capabilities, which is especially important for Biotechnology students, whose job perspectives are limited as there is not established biotech-industry in Oman.

To this end, the experts suggest offering an internship course with a minimum length of six weeks as part of the Bachelor’s degree programmes Environmental Biology and Biotechnology. It would be useful to draw up an internship guideline that defines the tasks and rights of the students during the internship. Moreover, the Department of Biology should, in cooperation with the College of Science, set up an internship coordinator, who helps students to find suitable placement and sign cooperation agreement with possible host institutions. However, the experts see that there are currently only a few private companies and public institutions, which can offer suitable internships for students from the Department of Biology. Hence, it would be impossible to make the internship a compulsory

part of the curriculum, but it could be offered as an elective and credits need to be awarded.

With respect to the curriculum of the Bachelor's degree programme Biotechnology, students point out in the discussion with the experts that they would prefer to have more courses offered in the area of medical biotechnology. It was mentioned by students that e.g. courses in embryology would be desirable. This course, however, is presently available and can be chosen as an elective. Still, the faculty may start a discussion with the students as to further develop the programme in this direction. The experts point out that biotechnology is a rapidly growing area in Oman, which offers many job opportunities for biotechnology graduates. Medical biotechnology encompasses various techniques and technologies used in healthcare, including genetic engineering, pharmaceuticals, diagnostics, and therapeutic interventions. The experts also observe that e.g. protozoa are not discussed in any of the courses. This is an important field, as some tropical diseases, e.g. malaria, are caused by protozoa. Educating students about these topics opens doors to various career paths in pharmaceuticals companies, healthcare institutions, and regulatory agencies. The programme coordinator have already realised these advantages and plan to introduce a new minor in medical biotechnology in the next academic year. The experts explicitly support the introduction of this new minor.

In the discussion with the students, it was recommended to establish a "Department Seminar" and invite national and international experts from companies, public institutions, and other universities to give lectures on current topics. The experts learn that such a seminar already exists. It is recommended to better promote the "Department Seminar" and to encourage students to attend it.

In the discussion with the stakeholders (alumni, employers) the experts learn that it would be useful to increase the cooperation with the stakeholders and to better consider the needs of the labour market in the design and content of the degree programmes. This is especially necessary in a fast developing area such as biotechnology. To this respect, students especially liked the course "Special Topics in Biotechnology", which covers how to turn research in real products and how to start a company.

The experts conclude that the imparted discipline-specific curricular content of all three programmes – minor exceptions given – reflects the state of the art and is adequate for the level and objectives of the programmes. The courses are suited for achieving the intended learning outcomes in a comprehensive manner, as specified in the module descriptions. The students and alumni interviewed by the experts during the audit underline that curricular content and learning outcomes match their expectations with regard to their professional career.

International Mobility

The experts discuss with the programme coordinators whether there are windows of mobility for the students and point out that the international visibility and reputation of a university is increased by its research activities and the academic mobility of staff members and students. The academic mobility of the faculty members is already quite high and almost all teachers have international experience and contacts.

Some cooperation agreements for sending Omani students abroad exist. However, studying abroad for a limited period during the Bachelor's programmes or the Master's programme is not a well-established option so far. The students confirm during the discussion with the experts that some opportunities for international academic mobility exist at SQU and that there are rules for recognizing achievements acquired at other universities outside SQU. However, they also point out that they are not well informed and that there are only few programmes to apply for. For example, Oman has SQU has just recently joint the ERASMUS programme and the central coordinator is from SQU, but the students do not know about this. On the other hand, there are some incoming students from other countries, who usually join a research group at the Department of Biology

Since the experts learn from students that many of them are interested in spending some time abroad, SQU should increase its efforts in initiating more exchange programmes with international universities and provide scholarships for qualified students. Additionally, SQU's own strategic plan stresses that internationalisation is becoming an increasingly important task for SQU. This is underlined by the following statement on SQU's homepage: "The university aims to strengthen [its internationalisation] in order to raise its profile and promote international collaboration. In pursuance of this aim, the inception of the Office of External Cooperation, now called, International Cooperation Office (ICO) in 2002 was the first step in that regard. SQU vigorously pursues collaboration with a variety of institutions in order to promote and strengthen both teaching and research, and also to enrich the experiences of its staff and students. Much of this collaboration takes the form of international cooperation at various levels. Indeed, internationalisation is a hallmark of all top universities today and is an essential strategy for any institution wishing to compete on the cutting edge of academia in a globalising world". However, the experts point out that no information about these programmes can be found on SQU's homepage. Even the page about the ICO only offers information about incoming international students but not on mobility opportunities for SQU students who want to go abroad.

The experts emphasise that it is very useful for students to spend some time abroad during their studies to improve their English proficiency and to enhance their job opportunities. A

good starting point to initiate international cooperations are the manifold personal international contacts of the faculty members.

Teachers at SQU have the opportunity to spend time abroad, either to pursue a higher academic degree, but also for attending international conferences or conducting joint research projects, even a sabbatical is possible.

In summary, the experts appreciate the effort to foster international mobility and support SQU and the Department of Biology to further pursuing this path. However, the academic mobility of students is still low and there is room for improvement.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Reports
- Webpage SQU: https://www.squ.edu.om
- SQU Undergraduate Academic Regulations
- Discussions during the audit

Preliminary assessment and analysis of the experts:
Admission to the Bachelor's degree programmes is based on the grades of the high school graduates. In order to be accepted at SQU, high school graduates must pass their School Leaving Certificate with a certain grade. For example, For example, the College of Science requires a minimum score of 65 % in the English language and in biology, chemistry, mathematics and physics (three out of this four subjects) examinations in the Oman General Education Diploma. To enter a college and to choose a major, a student must complete the "Foundation Programme". In 2016, the College of Science introduced uniform criteria for admission into all majors. The minimum criterion for admission into any programme includes a GPA of 2.0 and a grade of "C" in the courses selected by the department for the choice of major. The admission requirements are detailed in the SQU Undergraduate Academic Regulations that are published every other year and that are available via SQU's homepage. There are no tuition fees for studying at SQU (in the Bachelor's programmes).

The number of applications and accepted students for both Bachelor's degree programmes from 2018 to 2023 are shown in the following table. Red and black are for spring and fall semesters, respectively.

Year	# Students that applied for a new major "**Environmental Biology**"	# Students accepted in "**Environmental Biology**"	# Students that applied for a new major "**Biotechnology**"	# Students accepted in "**Biotechnology**"
2023	23 + 33	23 + 26	42 + 62	31 + 43
2022	24 + 35	19 + 28	46 + 57	29 + 24
2021	9 + no record	9 + 11	42 + no record	40 + 33
2020	16 + 21	16 + 21	28 + 35	28 + 35
2019	no record + no record	14 + no record	no record + no record	21 no record
2018	37 + no record	12 + 20	27 + no record	21 + 31

Table 3: Number applications and accepted students for both Bachelor's programmes, Source: SAR SQU

In summary, the experts find the terms of admission to the Bachelor's degree programmes to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

In order to be admitted to a Master's programme at SQU, applicants need to a Bachelor's degree with a minimum cumulative GPA of 2.75 on a 4-point scale or a minimum cumulative GPA ranging between 2.50 and 2.74 on a 4-point scale with a minimum of two years of work experience. In addition, applicant need to verify their sufficient English proficiency, for example an IELTS score of at least five or a score of 550 in a paper-based TOEFL. Candidates from other disciplines may be asked to attend additional bridging courses before starting the programme.

The number of applications and accepted students for the Master's degree programme Biology from 2018 to 2023 are shown in the following table.

Year	Applied for "MSc in Biology"	Admitted in "MSc in Biology"
2018	20	6
2019	20	11
2020	16	4
2021	18	5
2022	13	9
2023	22	8

Table 4: Number applications and accepted students for the Master's programme, Source: SAR SQU

The experts see that around 20 students apply for Master's degree programme Biology every year, however less than half of them are admitted in the programme. The programme coordinators explain that several students do not join the programme due to financial reasons. Master's students have to pay a tuition fee (4000 OMR ~ 9520 € for non-Omani and 3000 OMR ~ 7140 € for Omani students) and expect to receive a scholarship to cover them. Full and partial scholarships for Master's and PhD students are available, full scholarships cover the tuition fees and living expenses are mostly provided for international students in order to attract more foreign students and to promote internationalisation. If applicants do not receive a scholarship, they will usually not join the Master's programme but apply at another university. In addition, announcement of scholarships is done after registration, which is especially awkward for international students who need to know in advance if they receive a scholarship or not.

The experts learn during the audit that for enrolling in the Master's degree programme Biology first the eligibility is verified (GPA, English proficiency). Then, around 17 candidates are invited for an interview at the Department of Biology. During the interview, the candidates are asked about their research interests and for their motivation in joining the Master's programme. The experts point out that no official regulation on the content of the interview and the criteria for assessing the interview exists. It needs to be transparent for all candidates, how the interviews are conducted and on what criteria the acceptance is based. For this reason, the experts expect SQU and the Department of Biology to draw up a respective regulation and make in transparent to all interested persons, e.g. by publishing it on the programme's webpage.

Criterion 1.5 Work load and credits

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- YSU Regulation on Study Process Organisation
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The Biotechnology and Environmental Biology degree programmes are designed for 122 Omani credits. According to the Self-Assessment Report, one Omani credit is defined as one hour of lecture or three hours of practical work per week, the semester consists of 15 weeks. Thus, a three-credit course is normally two lectures (of 50 min) plus a three-hour lab. The registration for the courses is done online (and so controlled by a computer program) and usually students enroll for 12-15 credits each semester. Good students with a GPA > 3 are allowed to register for an extra course (18 credits), while poor students (GPA < 2) are only allowed 12 credits. Students who fall behind will have to prolong their studies.

The experts learn that most students finish their degree after eight or nine semesters and that there is only a very low dropout rate among the students: Approximately 95% of the students finish their degree. They see that as clear evidence for the adequate work load and the overall quality of the degree programmes. This impression is confirmed during the meeting with the students, which state that the work load is high but with effective time management and serious effort, every student can pass the exams.

The experts point out that there can be no fixed conversion rate between Omani credits and ECTS points. Therefore, the ECTS points need to be calculated separately for each course. This is necessary, because the time students need for self-studies is different for each course. Especially the ECTS point for the Master's degree programme Biology need to be re-calculated. Under the assumption that full time programmes should have a workload of 30 ECTS points per semester, the Master's programme should encompass around 120 ECTS point and not only half of this. As a consequence, Master's graduates applying at international universities for a PhD programme might be rejected, because the currently awarded ECTS points do not comply with a four semester long Master's programme. Moreover, exchange students from abroad will have difficulties with transferring their ECTS points back to their home-university.

Since the workload of the students was only estimated by the programme coordinators and seems to be too low in comparison to the actual time needed by the students, the experts suggest re-evaluating the calculation of ECTS and engaging the students in verifying the

weight of each module. This could e.g. be done by including a respective question in the course questionnaires. For this reason, it would be useful to include a respective question in the course questionnaires that are used for evaluating the quality of teaching and learning at the end of each semester. In any case, SQU must make sure that the actual workload of the students and the awarded ECTS points correspond with each other. This is especially necessary for the Master's thesis, where students spent a lot of their time in the lab or on self-studies.

The Bachelor's degree programmes are designed to be completed within four academic years. Unfortunately, data summarising the number of admitted students, dropout rates, and the number of graduations were not submitted for both programmes. In order to better assess the outcome of the programmes, the experts ask the Department of Biology to submit the KPI for both Bachelor's programmes together with its statement on the draft report. However, during the audit, the Biotechnology students complain that their workload, especially in the last two semesters, is quite high, which leads to a prolongation of the studies, as most students are not able to finish within eight but nine semesters. For this reason, it would be necessary to verify the students' total workload in the last two semesters and it might be useful to split the last semester into two parts. In the first part, students still attend some courses and in the second, they can concentrate on the graduation project. Currently, students have to conduct their graduation project parallel to attending classes, which is not advisable.

On the other hand, the Department of Biology did submit KPI (number of drop-outs and graduations, average length of studies) for the Master's degree programme Biology. The statistical data suggest that the degree programme can be completed within the regular timeframe of two years (full time) and three years (part time).

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

During the classes, active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. SQU wants to encourage the students

to gain knowledge from different scientific areas and wants them to be able to solve specific problems through an interdisciplinary approach. This should ultimately contribute to the transition from a teacher centered to a student oriented teaching method. In order to involve all students in the learning process and to develop their thinking and analytical skills, the teaching staff uses several methods of training and gives assignments on different levels of complexity.

The most common method of learning in the Bachelor's degree programmes is class session, with several courses having integrated laboratory work. Lecturers generally prepare presentations to support the teaching process. At Bachelor level, the students first gain theoretical knowledge and have more practical classes in their further studies. At Master level, students conduct more individual scientific research. In general, the following teaching methods are used in the degree programmes: lectures, seminars, laboratory classes, internships, small group activities, and final thesis.

With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre- or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods.

In the Master's degree programme Biology, more student centred learning models are applied in order to improve students' analytical and scientific skills. To this end, in most courses didactic methods such as cooperative learning, case studies, and project based learning are applied. In general, the focus in the Master's degree programme is on self-organised learning and research oriented teaching and learning methods.

Teachers are encouraged and supported in using different and modern teaching and learning methods, including collaborative learning, use of video materials, flipped classroom, and blended teaching.

Various teaching and learning methods (including lectures, computer training and classroom and lab exercises, field trips, individual and group assignments, seminars, and projects, etc.) have been implemented. Structured activities include tutorials, homework, assignments (reading or problem exercises) and practical activities. Group project assignments are given in some courses to develop students' skills in teamwork, communication, and leadership.

In summary, the experts considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concepts of all programmes under review comprise a variety of modern

teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

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

With respect to job opportunities, SQU explains in its statement that the majority of the graduates are employed in the areas of health, agriculture, education, oil and gas, environment, where biotechnology-related skills are needed. As the Omani government is fostering biotechnology and is trying to attract more international companies, it is expected that the job perspectives will improve.

The experts appreciate that SQU will offer and a new minor in Medical Biotechnology in fall 2024. They also endorse introducing a new course in “Scientific Communication”, starting the spring semester of 2024, in order to improve the students communication skills.

The experts understand that the name “Biology” for the Master’s degree programme signifies a broader range of education, which may improve the graduates’ job opportunities. They just point out that the programmes’ content is more on Biotechnology.

The experts are glad that SQU agree with the usefulness of introducing an internship programme and that it will not be easy to find suitable placements for all students. However, conducting an internship will be a valuable asset for the students and introducing an internship coordinator is a very helpful step in the right direction.

The experts see that the department conducts weekly seminars with presentations of postgraduate students (e.g., thesis progress, proposals, defences) and researchers. They just notice that this opportunity is not well known among the students and should be better promoted.

The experts acknowledge that SQU has recognised the benefits of promoting international exchange programmes and offers support to this effect. The experts are convinced that the efforts can be increased and that the students can be better motivated to spend some time abroad.

The experts hope that the current policy of awarding the scholarships for graduate students can be adjusted so that students know in advance if they can receive financial support or not. Making the admission criteria transparent on the Master’s programme’s homepage is also important.

The experts are glad to hear that the ECTS calculation was done separately for each course. However, just relying on the teachers estimation is not sufficient, it is necessary to ask the

students about their actual workload. Recalculating the ECTS points for the whole master's programme is part of this. SQU should submit the respective results in the further course of the procedure.

The experts thank SQU for submitting a table showing the number of newly enrolled and graduated Bachelor's students. However, it would also have been nice to see some conclusions on the provided data and some analysis on the average length of studies and number of drop-outs.

The experts consider criterion 1 to be mostly fulfilled.

2. Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- SQU Undergraduate Academic Regulations
- SQU Academic Regulations of Postgraduate Studies
- Academic Handbooks
- Study plans
- Module descriptions

Preliminary assessment and analysis of the experts:
According to the Self-Assessment Report, theory taught in the lectures is usually examined by a mid-term exam and a final exam. There is a period in every semester for mid-term and final exams. Students' performance is not only evaluated based on the final examination but assignments, quizzes, laboratory work, homework, mid-term exams, and seminar work may also contribute to the final grade of a course. Examinations are typically written exams, such as essays, problem-solving or case-based questions, and calculation problems. The form of the exams for every module is specified in the associated module description (course specification). Examinations are scheduled according to SQU's academic calendar.

The SQU Undergraduate Academic Regulations demand that at least three components of assessment contribute to the final grade with no component exceeding 60 %. If there is a final exam, it must account for 40 - 60% of the final grade. A detailed description of all required exams and their contribution to the final grade is included in each module description.

If students miss a final exam, they are allowed to take a supplementary exam within 15 weeks, providing they present a certificate that is either: medical, psychiatric or social (e.g. death in the family). Attendance is checked for each course, the students must sign for each lecture and lab session, and an online system will be introduced next semester. The results of an in-semester test are usually announced within one week after the test date. The deadlines for submission of final grades are set by the Deanship of Admission and Registration. Students can also appeal their grades if they think the result is not correct. The procedure is well known to them.

Each of the grades carries a numeric value for the purpose of calculating a weighted average on a 4.00 scale. These values are indicated below:

A	4.00	C+	2.30
A-	3.70	C	2.00
B+	3.30	C-	1.70
B	3.00	D+	1.30
B-	2.70	D	1.00

Table 5: Numeric value of the grades, Source: SAR SQU

According to the regulations of SQU, all undergraduate students are required to maintain a grade point average (GPA) of at least 2.0 out of 4.0. A student failing to maintain the GPA of 2.0 will receive a warning.

Students wishing to graduate with a Bachelor of Science are required to conduct a graduation project (Bachelor's thesis). For the current and future student cohorts, this 4-credit course is to be completed over the course of two semesters (1 + 3 credits, respectively). Specifically, students need to devote one semester to conducting literature research to produce an original review of a specific field. In the following semester, students need to conduct the actual research project, involving manipulations, data analyses and the production of a report, and an oral presentation. Additionally, students are required to partake in an interview regarding their project, which is conducted in front of three faculty members.

During the audit, the experts learn that there are some problems at the Department of Biology with assigning the Bachelor's students to suitable topics for the graduation project. Some teachers and topics are in higher demand than others are, which leads to an unequal distribution of supervised theses. To solve this issue, a scheme for assigning the topics has been devised, while taking into account the students' wishes. However, some students are obviously concerned that the topics are going to be assigned randomly and that they do not have a choice to pick a topic according to their interests but are just assigned randomly

to some supervisor. The programme coordinators explain that students still have a choice but equal distribution to all teachers is also important. The experts understand these problems and point out the new system should be made transparent to the students and the reason should be explained to them. This way, the students' concerns might be solved.

Master's students must finish the degree requirements with a minimum cumulative GPA of 3.00. For the Master's thesis, students must do the requisite literature review, conduct the research, evaluate the results, write the report, and present the findings in an oral defense. This work should include a novel application of concepts. In the second semester, students should identify the research problem in cooperation with their supervisor. After completing at least 12 credits of coursework, students should register for the thesis in the third semester.

As part of the on-site visit, the experts also inspect exemplary examinations as well as Bachelor's and Master's theses from all courses of study. Overall, they are satisfied with the quality of the examinations and theses.

Relevant rules for organizing and conducting examination, assessment criteria, procedures in case of re-sits, disability compensation measures, proceedings in case of illness and other mitigating circumstances are transparently put into legal regulations. Students and lecturers confirm in discussions that both sides are aware of the regulations, and the experts have the impression that this system is operative with the aim to meet the requirements of the students as far as possible. In discussions, students describe the organization of examinations as transparent and responsive to their needs. This judgment explicitly includes the policy of retaking the course in the case of a failure.

By studying the Self-Assessment Reports and from discussions during the audit, the experts gain the impression that the methods used by the teaching staff at the College of Science for assessing learning outcomes are mostly appropriate. The examination methods depend on the subject and the intended learning outcomes and range from mid-term and final examinations, laboratory works to subject-specific assignments and projects. The exams are usually written exams (e.g. quizzes, essay questions, calculation problems, or multiple-choice questions) there are only a few oral exams, for example for presenting the final project.

From studying the Self-Assessment Report and from discussions during the visit, the experts gain the impression that the methods used by the teaching staff at the Department of Biology for assessing learning outcomes are generally appropriate.

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

SQU does not comment on this criterion in its statement.

The experts consider criterion 2 to be fulfilled.

3. Resources

Criterion 3.1 Staff

Evidence:

- Self-Assessment Reports
- Staff Handbook
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:
At Sultan Qaboos University, the staff members have different academic positions. There are full professors, associate professors, assistant professors and teaching assistants/demonstrators. The academic position of every staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. All professors (full, associate, and assistant) needs to hold a PhD degree.

According to the Self-Assessment Report, the Department of Biology currently employs 20 full-time teachers (2 full professors, 10 associate professors, and 8 assistant professors). In addition, there are currently four visiting professors and four lecturers/part-time teachers. Moreover, 12 graduate students on scholarship are assigned duties in labs and tutorial sessions of introductory courses. Finally, the Department of Biology is supported by 14 technical staff members, who are in charge of preparing the lab and/or the field material, in addition, to supporting in teaching the practical sessions. All technical staff members hold degrees in science or engineering. Furthermore, the Department has two coordinators who look after the administrative duties.

In order to strengthen the sharing of scientific knowledge within the department, researchers and lecturers from other universities and from abroad are invited to give a guest lecture. The experts appreciate that the Biology Department has an international academic staff, with teachers coming from Oman and several other countries. The teachers all conduct research activities and have manifold international contacts and collaborations.

The experts discuss with SQU's management and the Department of Biology about the university's policies and strategies for hiring new staff members. Accordingly, the Head of Department is asked to submit a request indicating vacant positions and the need for hiring a specific expert in a field of research and teaching. Vacancies and job specifications are announced internationally and the number of applications is very high. Obviously, SQU is a very attractive employer. For example, there were around 3500 applications for the recently announced five open positions at the Department of Biology. These positions have been filled in the meantime. New teachers are usually hired as assistant professors and it takes a minimum of four years before teachers can be promoted to the next academic level. All new teachers need to have a PhD degree as well as research and teaching experience. Only in the Foundation Programme, some of the teachers have a Master's degree. Non-Omani teachers receive three-year contracts; Omani teachers are employed for life. With respect to promotion from associate to full professor, mostly research activities and publications is taken into account. There is a detailed regulation on the involved procedures and criteria and all the teachers are well informed about it.

The usual teaching load in a semester is 10 to 12 contact hours per week, which includes lectures and laboratory sessions. The department may reduce the course load of a teacher who is assigned a special duty by the department, the college, or the university. The teachers confirm that the teaching load is mostly adequate and leaves enough room for conducting research activities and fulfilling their administrative tasks.

In summary, the experts confirm that the composition, scientific orientation, and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes. The experts are very impressed by the excellent and open-minded atmosphere among the students and the staff members. The teaching staff is dedicated to SQU and the Department of Biology and always focused on improving the quality of the degree programmes.

Support and assistance

Sultan Qaboos University 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. In the Department of Biology, about 20 students from each cohort are assigned to one academic advisor.

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 if there are

problems with other teachers. The students confirm during the discussion with the experts that they all have an academic advisor whom they can approach if guidance is needed.

Involved in support and assistance are furthermore programme coordinators as well as all members of the teaching staff. The teaching staff offers office hours for meeting students. Sufficient resources for an effective support and assistance system exist and are appreciated and accepted by the students.

SQU offers an orientation week for new students, during which they are made aware of their rights and responsibilities. The students are referred to the relevant documents, which are either available on the University website or handed as hard copies to them. For example, the code of conduct is available in Arabic in the University Executive Regulations together with Academic Misconduct Policy.

In general, students stress that the teachers are open minded, communicate well with them, take their opinions and suggestions into account, and that changes are implemented if necessary.

Finally, students can take part at several non-curricular activities, which include arts, sports, religious and other interests.

The experts confirm that there are enough resources available to provide individual assistance, advice, and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them.

The experts appreciate the dedication and open-minded attitude of the teaching staff for supporting and assisting students. This strong engagement is directly reflected by dedication, contentment, and respect of the students towards their teachers, as expressed in conversations the experts have during the audit

Criterion 3.2 Staff development

Evidence:

- Self-Assessment Reports
- Staff Handbook
- Discussions during the audit

Preliminary assessment and analysis of the experts:
SQU encourages training of its academic and technical staff for improving their abilities and teaching methods. As described in the Self-Assessment Reports, SQU has established

the Center for Excellence in Teaching and Learning (CETL), which supports the teaching staff in further developing their didactic and professional skills. To this end, it offers several workshops and training courses on various issues related to teaching and learning. Participating teachers can receive a Certificate in Higher Education Teaching and Learning.

The Department of Biology also encourages the faculty members to conduct research activities and to participate in national and international conferences and workshops, which keeps them up to date with the recent developments in the fields of biology.

The experts discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at SQU, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops, or seminars; even a sabbatical leave is possible.

The experts see that there are sufficient financial resources available to develop the competence of the academic staff members for taking part in research projects or for attending conferences or other events like scientific seminars, trainings, and workshops in order to stay up to date with the scientific development in their area of expertise and to increase their competences.

In summary, the experts confirm that Sultan Qaboos University offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further develop their professional and teaching skills.

Criterion 3.3 Funds and equipment

Evidence:

- Self-Assessment Reports
- Visitation of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The experts discuss with representatives of SQU's management funding issues and available financial resources for the College of Science and the Department of Biology. They learn that the Omani government provides most funding (around 80 %). The Ministry of Higher Education, Research and Innovation is responsible for the majority of the funding, which is

used to fund all teaching and research activities, such as the purchase of basic and technological equipment, research projects, conferences, workshops, seminars, and scientific publications. In addition, there are some cooperations with companies, but this is limited because there is not much industry in the area of Muscat.

Additional funds from SQU, the College of Science, and the Department of Biology are available for research activities, but teachers have to apply form them. Small research grants are also available for undergraduate and postgraduate students for conducting their graduation projects from the Omani government.

The provided budget allows the Department of Biology to conduct the study programmes as well as some specific activities, including research activities and participation in international conferences. In addition, SQU provides dormitories, bookstore, cafeteria, a hospital and several facilities for cultural, sports and other extracurricular activities to achieve a positive balance between academic and extracurricular activities.

One critical point from the experts' point of view is the fact that not all the teaching laboratories in the College of Science follow international safety standards. The experts point out that the basic personal protective equipment needs to be available to all persons working in laboratories, this includes safety goggles, laboratory coats, and hand gloves. It must be worn all the time when working in the laboratory. Additionally posters with safety instructions, first aid kids, emergency showers, and fire extinguishers should be installed in every laboratory. On the other hand, the research laboratories in the Department of Biology are all following Good Laboratory Practise (GLP) and there are no issues concerning safety measures.

The Department of Biology also hosts the Central Analytical and Applied Research Unit (CAARU), which is an ISO 9001-2008 certified laboratory. The unit is well equipped with all major instrumentations required for different types of analyses. The unit has three departments namely mass Spectrometry & Chromatography, Material Sciences, and Cellular & Molecular Biology. CAARU also provides training to students, researchers and staff from SQU, and other institutions in Oman and abroad.

From visiting the facilities and classrooms the experts gain the impression that infrastructure is adequate for education according to the aims of the degree programmes under review. The teaching laboratories are sufficiently equipped to meet the basic requirements for teaching. However, some of the visited teaching laboratories are in need of renovation and the outdated instruments should be replaced. The wooden tables could be replaced by more suitable benches and some of the he broken instruments and glassware could be removed. This is necessary especially with regard to handling genetically modified organisms, which is an important issue in many countries outside of Oman. On the

other hand, the research laboratories of the department are well equipped and are sufficient to carry out the research projects.

The academic staff members emphasise that from their point of view, all three programmes under review receive sufficient funding for teaching and learning activities. There are no serious difficulties associated with either human resources in terms of lecturers and lab assistants available or other supporting facilities to conduct the teaching and learning activities. The lab equipment is mostly in sound condition and is adequate and feasible to support academic activities in both classroom and laboratory settings. The experts especially appreciate the modern facilities at the Central Analytical and Applied Research Unit. The students confirm this positive impression and state their satisfaction with the available resources.

During the discussion with the students, the experts learn that in several practical courses of the Bachelor's programmes the experiments are prepared by the technical staff members and not by the students. The experts point out that it is essential for all students to get sufficient hands-on experience in the laboratory. For this reason, SQU needs to make sure that students prepare and conduct all the experiments in the teaching laboratories by themselves.

In summary, the experts consider the available funds, the technical equipment, and the infrastructure (laboratories, library, seminar rooms etc.) to comply – except of the mentioned restrictions- with the requirements for adequately sustaining the degree programmes.

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

The experts are glad that SQU agrees with their comment regarding the need to uphold international safety standards in the laboratories and will upgrade them. Additionally, it is essential to make clear to all teachers that students need to conduct the experiments by themselves. Increase in budget for the teaching lab consumables and equipment so that the experiments can be conducted by groups of 2-3 students is an important step in the right direction. The experts expect SQU to verify the implemented improvements in the further course of the procedure.

The experts consider criterion 3 to be mostly fulfilled.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Self-Assessment Reports
- Module descriptions
- Webpage SQU: https://www.squ.edu.om
- Webpage Department of Biology: https://www.squ.edu.om/science/Departments/Biology
- Webpage Ba Biotechnology: https://www.squ.edu.om/science/Departments/Biology/BSc-in-Biotechnology
- Webpage Ba Environmental Biology: https://www.squ.edu.om/science/Departments/Biology/BSc-in-Environmental-Biology
- Webpage Ma Biology: https://www.squ.edu.om/science/Departments/Biology/Postgraduate
- Discussions during the audit

Preliminary assessment and analysis of the experts:
Sultan Qaboos University provides module descriptions for all three programmes under review that include all necessary information about teaching methods, intended learning outcomes, content, admission and examination requirements, forms of assessment, details explaining how the final mark is calculated, and biographical references.

However, the experts point out that the module descriptions for the Master's thesis is not complete; it does not include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies). For this reason, the experts expect SQU to update the module description for the Master's thesis and include all required information.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Reports
- Sample Diploma for each degree programme
- Sample Diploma Supplement for each degree programme

Preliminary assessment and analysis of the experts:
The experts confirm that the students of all degree programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Diploma Supplement contains all required information about the degree programme and follows the European template.

The Transcript of Records lists all the courses that the graduate has completed, the achieved grades, and cumulative GPA. However, the Transcript of Records should also list the awarded ECTS points for each course.

Criterion 4.3 Relevant rules

Evidence:

- Self-Assessment Reports
- All relevant regulations as published on the university's and department's webpages

Preliminary assessment and analysis of the experts:
The experts confirm that the rights and duties of both SQU and the students are clearly defined and binding. All relevant course-related information is available in Arabic and English and accessible for all stakeholders.

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

The experts point out that the information about the Master's thesis on the programme's homepage is still incomplete. As for every other course, the module descriptions needs include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies). For this reason, the experts expect SQU to update the module description for the Master's thesis and include all required information.

The experts consider criterion 4 to be mostly fulfilled.

5. Quality management: quality assessment and development

Evidence:

- Self-Assessment Reports
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts discuss the quality management system at Sultan Qaboos University with the programme coordinators and the students. They learn that there is a continuous process in order to improve the quality of the degree programmes and it is carried out through internal and external quality assessment.

Internal evaluation of the quality of the degree programmes is provided through the Biology Curriculum committee (which reports to the Biology Departmental Board) and through student participation. Students provide feedback through their representatives on the Student Liaison Committee, through course questionnaires (an on-line questionnaire) and via direct communication with the teaching staff and the Head of Department.

On college level, the QA processes are coordinated by the Quality Assurance and Academic Accreditation Unit with the goal of enhancing the academic performance at Sultan Qaboos University. QA processes are designed for the continuous improvement of the degree programmes through monitoring, assessing, and analysing the teaching and learning methods. The Departments of Biology is part of the College of Science. The head of the college is the Dean, who also acts as the chair of the College Board. The Dean manages the college and is responsible for the results.

External quality assessment of the degree programmes is provided by institutional accreditation of the university by the national Omani accreditation agency. In addition, an external examiner reviews the degree programmes every year. Finally, there is an advisory board at the College of Science, where representatives from ministries and companies discuss with the Dean and the Head of Departments their needs and wishes according to the demands of the labor market.

The organizational structure of SQU is depicted in the following diagram:

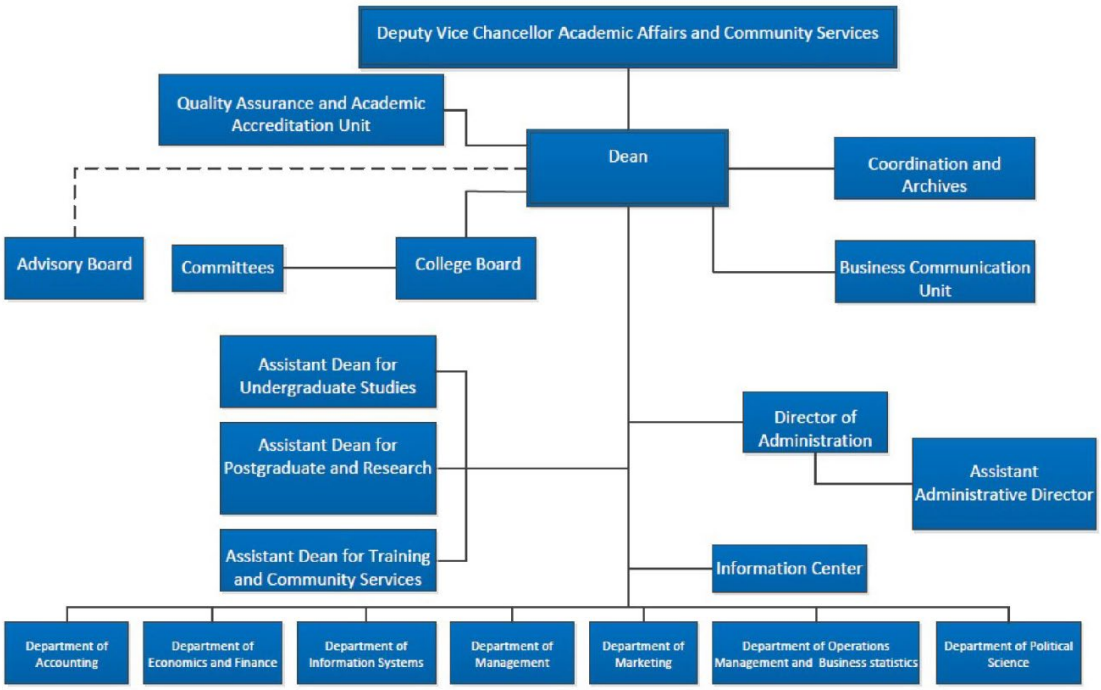

Diagram 1: Organisational Structure SQU, Source: SAR SQU

There is an online survey to ask the students about their opinion on the quality of the classes; it offers the students the opportunity to give feedback on each module. Via the online platform, the students can give feedback about their classes at the end of each semester. These course questionnaires aim at continuously improving the degree programmes and at creating a supportive and effective learning environment for students. When there is negative feedback in the student course questionnaires, the Department of Biology first talks to the involved teacher, analyses the problems, and offers guidance. If problems are not solved, the teacher receives an official warning and as a last resort, non-Omani staff members may have to leave the university.

Moreover, students can also directly address the Head of Department. To this end, there was a first meeting this semester between students and the Head of the Department. The experts appreciate this initiative and suggest conducting this meeting regularly and representatives of all batches should be invited.

The course questionnaires are conducted in week 12 of the semester. However, the results are usually not discussed with the students, because the teachers receive them only after the end of the exam period. Participation is voluntary and the response rate rather low. Currently, there is no feedback to the students about the results of the course questionnaires. For this reason, the experts point out that the Department of Biology needs to make sure that all students receive information on the results of the course questionnaires and that the surveys are conducted anonymously.

The Staff-Student Liaison Committee is supposed to serve this purpose. There are two students from each cohort plus Master's and PhD students in this committee and they meet at least once a semester with the staff members. There is also a Staff-Student Liaison Committee at the College level. Moreover, the University has an elected Student Advisory Board, which represents the students with the university's higher administration.

However, during the discussion with the students, the experts learn that the students do not know their representatives on the Staff-Student Liaison Committee and, thus, do not receive a feedback on the results of the course questionnaires. Therefore, it would be useful to announce officially, which students are members of the liaison committee and how they can be contacted. In addition, the experts suggest including a question about the students' workload in the course questionnaire (see criterion 1.5.).

The experts discuss with the representatives of SQU's if there are regular meetings to discuss the needs and requirements of the employers and the job market. They learn that there is an advisory board with external stakeholders at the College of Science. The experts appreciate that SQU stays in contact with its alumni and the employers. However, no academic advisory board at the Department of Biology exists. As the experts consider the input of the employers to be very important for the further development of the degree programmes, they recommend establishing an academic advisory board at the Department of Biology in order to discuss regularly with about the needs of the job market and new developments in the area of biology and biotechnology. The advisory board should consist of a group of professionals, employers, and experts of the relevant fields from outside the university. Especially in fast developing scientific fields, it is important to have a close communication with the different stakeholders, especially the strong public sector in Oman. For example, there is the National Biotechnology Committee, which was established in 2021. It has the task of creating an overall national strategy, reviewing all current legislation, regulations and controls in Oman regarding the regulation of the use of biotechnology and its products in the medical and agricultural fields as well as in other industries. A representative from Sultan Qaboos University is a member of the National Biotechnology Committee.

To better prepare students for entering the job market, SQU has established the Center of Career Guidance, which offers several services for employers and students to consolidate the relationship between SQU and various business sectors. It also provides guidance and advice to SQU students in choosing and planning their career pathway and identifying the ways of preparing for a job. Finally, SQU has an Alumni Office, which regularly conducts an alumni survey. In addition, the Department of Biology is keeping in touch with their alumni but they do not keep any official statistics on the employment areas or employment rates.

In summary, the expert group confirms that the quality management system –despite minor issues - is suitable to identify weaknesses and to improve the degree programmes. Students and all other stakeholders are involved in the process.

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

The experts support the plan of providing students with a questionnaire to share their thoughts on their courses in Week 6-7 of the semester. This way, teachers can discuss the results with their students before the end of the term.

Officially announcing the student members of the liaison committee to all students and posting this information posted on the department's website is a good idea, which will hopefully solve the obvious information deficit among the students.

The experts appreciate that the Department of Biology will establish an advisory board with external stakeholders.

The experts consider criterion 5 to be mostly fulfilled.

D Additional Documents

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

- KPI of the Bachelor's degree programmes

E Comment of the Higher Education Institution (12.01.2024)

SQU provides the following statement:

“After conducting an on-site evaluation of the BSc programs in Biotechnology and Environmental Biology, as well as the MSc program in Biology at SQU in November 2023, the ASIIN peers compiled their findings and conclusions in the accreditation report. In the following document, SQU responds and/or comments to the peers ‘concerns’ and/or ‘suggestions’ regarding our programs.

The peers offered conclusions regarding the Bachelor’s degree program in Biotechnology regarding the job prospects of Omani students. Page 9.

- SQU agrees with what is reported, specifically the rather modest scope for employment in the biotechnological sector of Oman. Oman has a limited market and a number of industries to absorb all graduating students in the Biotechnology program. However, the majority of the graduates are employed in allied private and governmental sectors related to health, agriculture, education, oil and gas, environment, where biotechnology-related skills are needed. Nevertheless, with the emerging National Strategy on Biotechnology that is adopted by the government in Oman, it is envisaged that the employment of our graduates in the field will increase. Moreover, the Investment Authority of Oman is now attracting international biotechnology companies to invest in Oman, and these companies have already approached us to employ our students.
- Our program has made great strides in promoting ‘soft skills’ in students, namely communication skills (both orally, visually and in writing), problem-solving skills, and safety awareness. This has been achieved mostly by having compulsory final undergraduate thesis projects. Note: these skills have also been developed in students enrolled in our Environmental Biology program. These skills have enabled our students to adopt to different working environments.
- We thank ASIIN team for endorsing our efforts in introducing a new minor in medical biotechnology in order to increase the chances of our students to get employment in medical-related sectors. We assure you that progress has already been made and a new course in Medical Biotechnology has already been designed and waiting for the necessary approvals to be offered in Fall 2024. The development of the minor in Medical Biotechnology, which consists of 18 credits taken from a selection of courses, besides the major specialization, is already underway. This new minor will include new

courses including Introduction to Medical Biotechnology, Immuno-Technologies, Personalized Medicine, Biopharmaceuticals Applications, and Genetics. These courses will cater to a vast array of biotechnology students at SQU and should promote their scope for employability in the medical biotechnology sector of Oman, and potentially elsewhere. So far, the response of students regarding these new courses has been overly positive.

The peers expressed their conclusions regarding the skills necessary for MSc students to possess. Page 9.

- We agree with the peers' assessment regarding the necessity for graduate students to possess strong communication skills. In view of promoting these skills in our students, a course in "Scientific Communication (BIOL6226)" has been made available to all postgraduate students of the Biology Department of SQU, starting the spring semester of 2024. The learning outcomes of this course include developing skills in writing, presentation, information literacy, visual communication, ethical communication, audience awareness, peer review, critical thinking, collaboration, and adaptability to effectively convey scientific information to diverse audiences.

The peers were concerned with the name of the MSc degree program in Biology. Page 10.

- We agree with the peers relative to the fact that the MSc program in Biology offered at SQU is heavily weighted toward biotechnology, as per the curriculum associated with this program. Many of our postgraduate students initially complete their undergraduate degrees in our biotechnology program, and the MSc courses are designed to build on their existing knowledge and elevate the level of their skills in modern technologies and prepare them to work with industries. In the second year of their postgraduate studies, the primary focus shifts to their thesis research, with the specialization determined by the chosen thesis topic. This often involves crucial areas of fundamental biology research required by our country, ranging from molecular to species-level studies, and retaining the term "Biology" in our program's nomenclature ensures inclusivity for a diverse array of thesis topics that students can select. An additional advantage of retaining the name of the MSc degree is to increase the employability of our students in the Education sector, where jobs are more abundant and very often the preferred career path for many of our MSc graduates, especially females. Additionally, our PhD program also follows this nomenclature to accommodate a broad spectrum of biological science areas that are essential to meet the needs of various stakeholder organizations in our country.

  In this regard, we would like to draw attention to the fact that the MSc Biology program was initiated in 1986, with its content consistently evolving to match the market

needs. Moreover, the process of changing the name of any program at SQU is a lengthy process (may take up to 2-3 years), and requires approvals of many administrative levels. The department will discuss this issue internally from all perspectives to find out the best way forward

The peers were concerned with the absence of a systematic internship program, given such an experience, promotes employability and the development of soft skills. Page 14.

We agree with the peers regarding the value of making available internships to undergraduate students to provide them with first-hand experience in their related field of study within a business and/or government. Given the limited number of vacancies that may be offered to students in Oman, the approach poses challenges when considering offering internships to all undergraduate students. Nonetheless, such an internship program can accommodate a few, highly motivated, students. The department has become part of a governmental initiative called "Edaad", where students work for one year in different industries in Oman, with this experience being calculated as a two-course equivalent, or a total of 6 hours. For this purpose, we introduced two new courses called Internship I (BIOL5511), Internship 2 (BIOL5512) and Special Topics in Entrepreneurship and Innovation Management in Bioeconomy (BIOL5110) to accommodate this program. For the reasons mentioned above, we have a few students who have become part of this program. Nonetheless, students have been involved in a number of industry sectors including AI-biosecurity (biosensors), thin-film technology and nanomedicine, bio-informatics and genetic engineering.

- The department has now initiated a discussion on introducing summer internships for our students as a new "elective" and we are in the process of establishing an internship coordinator who can facilitate potential internships in Omani business and/or government.
- As mentioned above, the Department of Biology made substantial efforts to enhance the development of soft skills among undergraduate students. We recognize the importance of these skills to prospective employers. Consequently, by making the final undergraduate thesis a mandatory requirement, we have witnessed significant improvement in these skills, as they are closely tied to scholarly performance. While we acknowledge the fact that undergraduate theses may not entirely replace internships, we have noted substantial improvements in students' communication, problem-solving and skills related to safety.

The conclusions drawn by the peers concerning the curriculum of the Bachelor's degree program in Biotechnology, suggesting for an expansion of course offerings in medical biotechnology. Page 15.

- As mentioned above, we are preparing new courses in Medical Biotechnology and a new minor in Medical and Pharmaceutical Biotechnology. Progress is ongoing and we anticipate offering these courses as early as Fall 2024. Courses including Embryology, Immunology, and others with relevance to medical biotechnology, will be offered to undergraduate students enrolled in our Biotechnology program.

The peers were concerned regarding offering department seminars. Page 15.

- Contrary to what may be believed by the peers, the department conducts weekly seminars. These seminars encompass various topics, including the scholarly work of postgraduate students (e.g., thesis progress, proposals, defences) and presentations by researchers from our department and others. In the last semester, a list of the seminars that have been conducted at the department level. Nevertheless, the department is committed to improving the visibility of these seminars and ensuring that students are well-informed. To achieve this, we plan to involve the undergraduate student representatives, who can subsequently inform their peers about upcoming seminars. Additionally, a new course in Scientific Communication has been introduced (as previously outlined), which will require enrolled students to attend departmental seminars to assess the presenter's performance.
- Furthermore, the Department has established an annual symposium on Biotechnology and Conservation, which not only involves the participation of researchers but also national and international stakeholders, including businesses, government and NGOs. This symposium was mandatory for students to attend and received very positive appraisal and participation.

The peers were concerned with the necessity to promote international mobility among undergraduate students (and faculty). Pages 16-17.

- The Department wholeheartedly promotes international exchanges of undergraduate students to foreign institutions to broaden their expertise and further their formation. To this effect, some programs are already in place, one of which is the Erasmus Program, which is a European Union initiative that promotes international student and staff mobility in higher education. It is one of the most well-known and successful programs for international education and cooperation in the world. Students in other departments have already partaken in this program. However, undergraduate students in the Department of Biology have yet to engage in this program. The International

Cooperation Office of SQU aims to strengthen the University's profile and promote international collaboration. Information regarding potential student exchange can be found on their homepage (https://www.squ.edu.om/About/University-Administration/Office-of-the-Assistant-VC-for-International-Cooperation/-Student-Exchange-Application).

- Nevertheless, the Department is dedicated to enhancing the visibility of this information on its website. Recognizing the significant impact that exchange programs can have on the academic development of certain students, we aim to make these opportunities more easily accessible.
- However, the Department also acknowledges the challenges that most students may face when contemplating an international exchange program. Primarily, students would need to bear the expenses associated with such exchanges, unless scholarships are provided. Additionally, given the cultural background and heritage of Omani students, international exchanges would necessitate meticulous planning and consideration.
- Regarding the enhancement of English language proficiency, we acknowledge the benefits of international exchanges in this regard. Nevertheless, it's important to note that SQU provides various resources for this purpose. One such resource is the IELTS program, one of the world's most renowned English language programs and tests, which is available to SQU students. This program includes practical components aimed at facilitating students' improvement in English. Students can obtain information and register at the following website: https://www.squ.edu.om/cps/IELTS
- The faculty has the opportunity to attend and present their work at an international conference each year, thanks to the funds allocated for this purpose. In the past five years, at yearly international conference attendances by faculty took place. Moreover, in every research grant, it is possible to request travel money and exchange visits with international collaborators, for a total amount of 2000 OMR per project. A number of our staff have managed to secure these funds.

The peers were concerned relative to the discrepancy between the MSc application process, and the announcement of receiving a scholarship for study. Page 19.

- We agree with the peers regarding the need to inform students regarding the obtention of a potential fellowship before his/her acceptance to enrol in the MSc program. The current procedure is for all the colleges in the SQU. We have communicated this concern with SQU Deanship of Postgraduate Studies and with the DVC for Research and Postgraduate Studies and they are in the process of changing the schedule regarding the announcement of fellowships. This will help prospective candidates in deciding whether to enrol in a postgraduate program.

The peers commented on the MSc admission, specifically on the necessity to present the regulations associated with the interview process and the criteria for assessing MSc candidates. Page 19.

- It's important to acknowledge that the admission criteria are outlined in the postgraduate guidelines and on the SQU website. We appreciate the peers' input, which has prompted us to reiterate and emphasize this information to ensure that all prospective students may easily access the admission requirements. We agree with the peers regarding the necessity of having transparent criteria by which applicants to the postgraduate program are judged. The Department has now rectified this situation and provided a rubric for assessment. Please see Evidence Document 1 [MSc Rubrics], attached. This information will be uploaded to the MSc website: https://www.squ.edu.om/ps/programs/articleid/783/msc-in-biology, and will be sent to all applicants before conducting the entrance exam and the interview.

Peers commented on the workload and credits, and more specifically, on the number of ECTS points calculated for each undergraduate module. Page 20.

- While we agree with the peers that no fixed conversion rate between Omani credits and ECTS points can be afforded, the ECTS allocated for each undergraduate module was calculated separately for each course. Calculations of workload were conducted based on the module's coordinator's appraisal of the time required to conduct self-study. As such, these credits were not awarded 'in batch', but were rather individually calculated. The Department has endeavored to standardize the overall amount of material presented to students in each course during a semester. Despite the individual ECTS calculations, there we attempted to maintain consistency in workload across courses. Nonetheless, as detailed below, future students' assessments of a given module will be given before the end of the semester, thereby allowing the module's coordinator to adjust, if needed, the course workload. Additionally, such assessments will also inquire about qualitative and quantitative aspects regarding the efforts involved in self-study.

The peers commented on the number of ECTS points awarded for the MSc degree program in Biology, which seems too low compared to established European standards. Pages 20-21.

- We concur with the peers regarding the importance of offering clear and transparent information on the effort required for completing an MSc degree in Biology. Alongside this, determining the appropriate number of credited ECTS is crucial. Following the commonly accepted calculation of ECTS credits, where one credit

equates to approximately 24-30 hours of study (including self-study), we have reached the following conclusion regarding the total number of ECTS credits required.

For the first year of the MSc program, comprising both semesters one and two, which encompass theoretical classes and laboratory work, a typical workload involves approximately 30 hours per week of scholarly activities, with an additional 20 hours allocated for self-study. In the second year, encompassing semesters three and four, which primarily focuses on thesis completion and experimental work, students are expected to dedicate an average of 50 hours per week to their studies/experiments.

Based on these workload assessments, the calculation of ECTS credits results in 25 credits for each semester, culminating in a total of 100 ECTS credits for the entire MSc degree program. These calculations consider a 15-week semester. This number of ECTS credits is consistent with information provided on the "European Credit Transfer and Accumulation System" website, which stipulates that an MSc degree program should include between 90 and 120 ECTS credits.

The peers made the following comment: "The Bachelor's degree programmes are designed to be completed within four academic years. Unfortunately, data summarising the number of admitted students, dropout rates, and the number of graduations were not submitted for both programmes. In order to better assess the outcome of the programmes, the experts ask the Department of Biology to submit the KPI for both Bachelor's programmes together with its statement on the draft report." Page 21.

- Please see the Evidence Document 2 [KPI], attached.

The peers communicated their concerns regarding safety in the teaching laboratories, particularly regarding the benches' quality and the availability of safety equipment, including the need to renovate (enhance) the lab facilities. Pages 30-31.

We agree with the peers regarding the need to uphold international standards of safety. The College of Science and the Department of Biology have committees devoted to standardizing safety in all locations, including the teaching labs. Any missing equipment has either been provided or has been requested.

- While we concur with the peers' concerns about the age of our teaching laboratories, we contend that their current condition is adequate to meet safety standards and support effective lab teaching. This assessment is based on information provided by

our technical staff and safety committee, which confirms the absence of significant incidents attributable to the benches or equipment. Our benches undergo annual polishing and revarnishing to maintain a smooth and safe working surface. Nevertheless, we have requested funds for potential lab updates and anticipate renovation in the near future, possibly during the summer of 2024.

The peers pointed out the necessity for all students to get sufficient hands-on experience in the laboratory. Page 31.

- The laboratories offered in the Department of Biology require that students prepare and conduct all the experiments by themselves. This issue has been recurrently discussed in the department board meetings and it was made clear that students should be responsible for their experiments. Moreover, the Department has requested an increase in budget for the teaching lab consumables and equipment that would enable every student (or groups of 2-3 students) to run their own experiment. Moreover, SQU provides students with the chance to enhance their practical skills by assisting in the preparation and management of teaching labs during their free time, with compensation offered for their efforts.

The peers pointed out that the module description for the Master's thesis is not complete, as it does not include information about the awarded credit hours, ECTS points and the student's total workload. Page 32.

- We have calculated the ECTS and self-study time, and provided this information on the MSc in Biology website: https://www.squ.edu.om/science/Departments/Biology/Postgraduate

The peers were concerned regarding the course questionnaires that are conducted in week 12 of the semester, and thereby cannot be discussed with the students because the teachers receive them only after the end of the exam period. Page 35.

- We agree with the peers on the importance for the module coordinators to get feedback from students in a timely way. However, this practice is performed across SQU for all courses at the same time (Week 12), and the results are only communicated with instructors at the end of the semester, so improvement can be implemented in the next semester. Any changes in this policy will have to be adopted at the university level.
- Nevertheless, we concur with the suggestion provided by the peers regarding providing students with a questionnaire to share their thoughts on their courses, starting from Week 6-7, which is around the midterm point. These questionnaires will be in

the form of an anonymous Google survey, allowing module coordinators to make changes to their courses if needed, based on students' inputs.

The peers were concerned with the fact most students do not know their representatives on the Staff-Student Liaison Committee and, thus, do not receive feedback on the results of the course questionnaires. Page 34.

- The department has promptly acted on this comment and has arranged for meetings with BSc and MSc students to nominate their representatives. We will officially announce the members of the liaison committee to all students, which can provide information to students who reach out to them. The current student liaison will be advertised with this information posted on our Department's website.

The peers were concerned about the absence of an academic advisory board at the Department of Biology. They emphasized the significance of employer input in shaping the future of degree programs, i.e., based on the needs of the job market. Page 36.

- The Department acted on this concern/recommendation and contacted at least 15 candidates to be nominated for the department advisory board. These candidates represent potential employers from industries and government, stakeholders and former graduates. As soon as a final list of candidates is established, the necessary approvals will be sought from SQU administration. We anticipate having the first meeting of the newly formed advisory board near the end of June 2024.

F Summary: Expert recommendations (29.01.2024)

Taking into account the additional information and the comments given by SQU, the experts summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biotechnology	With requirements for one year	-	30.09.2029
Ba Environmental Biology	With requirements for one year	-	30.09.2029
Ma Biology	With requirements for one year	-	30.09.2029

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

A 2. (ASIIN 5) Make sure that all students receive information on the results of the course questionnaires and that the surveys are conducted anonymously.

For the Bachelor's degree programmes

A 3. (ASIIN 3.2) All teaching laboratories need to follow international standards (good laboratory practice) with respect to safety measures and personal protection gear.

A 4. (ASIIN 3.2) Make sure that students do all the experiments in the teaching laboratories by themselves in order to gain the necessary hands-on experience.

For the Master's degree programme

A 5. (ASIIN 1.4) Make the admission criteria for the Master's programme transparent.

A 6. (ASIIN 4.1) The module descriptions for the Master's thesis needs include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies).

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to further promote the students' academic mobility and to establish more international cooperations.

E 2. (ASIIN 1.3) It is recommended to better promote the "Department Seminar" and to encourage students to attend it.

For the Bachelor’s degree programmes

E 3. (ASIIN 1.3) It is recommended to introduce an internship with a minimum length of six weeks to the curriculum of the Bachelor's programmes.

E 4. (ASIIN 3.2) It is recommended to renovate the teaching laboratories and to replace the outdated instruments.

G Comment of the Technical Committees (14.03.20249

Technical Committee 10 –Life Sciences

Assessment and analysis for the award of the ASIIN seal:

The two Bachelor's degree programmes are to be reaccredited, while the Master's degree programme is to be accredited for the first time. After a brief discussion of the procedure, the Technical Committee agrees with the assessment of the expert group and supports the requirements. In particular, the improvement of safety standards in the teaching laboratories is essential. The Technical Committee decides to upgrade recommendation E4 to a requirement, as it must be ensured that the laboratory equipment is improved and modernised. The university should therefore submit a corresponding concept. The other three recommendations are supported by the Technical Committee.

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

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditation**
Ba Biotechnology	With requirements for one year	-	30.09.2029
Ba Environmental Biology	With requirements for one year	-	30.09.2029
Ma Biology	With requirements for one year	-	30.09.2029

Technical Committee 11 –Geosciences

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee agrees with the assessment of the experts and confirms the proposed requirements and recommendations.

The Technical Committee 11 – Geosciences recommends the award of the seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific labels**	**Maximum duration of accreditation**
Ba Environmental Biology	With requirements for one year	-	30.09.2029

H Decision of the Accreditation Commission (22.03.2024)

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

The Accreditation Commission discusses the procedure and decides to follow the suggestion of TC 10 to upgrade recommendation E 4 to a requirement because it is essential that the laboratory equipment is improved and modernised. Otherwise, no changes to the other requirements and recommendations are made.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biotechnology	With requirements for one year	-	30.09.2029
Ba Environmental Biology	With requirements for one year	-	30.09.2029
Ma Biology	With requirements for one year	-	30.09.2029

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

A 2. (ASIIN 5) Make sure that all students receive information on the results of the course questionnaires and that the surveys are conducted anonymously.

For the Bachelor's degree programmes

A 3. (ASIIN 3.2) All teaching laboratories need to follow international standards (good laboratory practice) with respect to safety measures and personal protection gear.

A 4. (ASIIN 3.2) Make sure that students do all the experiments in the teaching laboratories by themselves in order to gain the necessary hands-on experience.

A 5. (ASIIN 3.2) It is necessary to renovate the teaching laboratories and to replace the outdated instruments

For the Master's degree programme

A 6. (ASIIN 1.4) Make the admission criteria for the Master's programme transparent.

A 7. (ASIIN 4.1) The module descriptions for the Master's thesis needs include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies).

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to further promote the students' academic mobility and to establish more international cooperations.

E 2. (ASIIN 1.3) It is recommended to better promote the "Department Seminar" and to encourage students to attend it.

For the Bachelor's degree programmes

E 3. (ASIIN 1.3) It is recommended to introduce an internship with a minimum length of six weeks to the curriculum of the Bachelor's programmes.

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **Programme Learning Outcomes (PLO)** shall be achieved by the Bachelor's degree programme Biotechnology:

a. Be able to demonstrate their knowledge in general biological concepts as well as knowledge in the area of Biotechnology.

b. Be aware of contemporary issues able to apply knowledge and skills to investigate and solve problems related to Biotechnology.

c. Be able to communicate (verbally or in writing) their biological knowledge to various levels of audience with regard to the field of Biotechnology.

d. Demonstrate high level of ethical and social conduct in the practice of their profession and awareness of occupational health and safety issues related to the workplace.

e. Be able to learn independently and become a lifelong learner.

f. Be able to work well independently and/or in a team.

g. Be able to engage in supporting community affairs relevant to Biotechnology.

The following **curriculum** is presented:

	Course Code	Course Title	Cr.
Semester 1 Fall	ARAB1060 or ARAB1019	Arabic Arabic for Non-Arabic speakers (3 Cr)	2
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2
	LANC2058	Communication in Science	3
	BIOL2101	General Biology I	4
	CHEM 2101	General Chemistry I	4
	Total		**15**

Semester 2 Spring	BIOL 2102	General Biology II	4
	BIOL2900	Experimental Design and Basic Biological Data Handling	3
		College Elective	4
		University Elective	2
	SOCY1005 or SOCY1007	State and People Omani Contemporary Society (For Non-Omani students	2
	Total		**15**

Semester 3 Fall		College Elective	4	F F F
	BIOL3441	Introductory Microbiology	3	E
	BIOL3202	Molecular Biology	3	E
	BIOL3011	Plant Physiology	3	E
		University Elective	2	
	Total		**15**	

Semester 4 Spring	BIOL3023	Animal Physiology	4	B
	BIOL4500	Cell Biology	3	B
	CHEM3324	Organic Chemistry for Engineering	4	C
		Major Elective	3	
		University Elective	2	
	Total		**16**	

Semester 5 Fall	BIOL4034	Biochemistry	3
	BIOL4046	Fundamentals of Biotechnology	3
	BIOL4432	Genetics	3
		Major Elective	3
		Major Elective	3
	Total		**15**

Semester 6 Spring	BIOL4030	Bacteriology	3
	BIOL4700	Environmental Biotechnology	3
	BIOL5031	Enzyme Biochemistry	3
		Major Elective	3
		Major Elective	3
	BIOL5003	Graduation Research Skills	1
	Total		**16**

Semester 7 Fall	BIOL5120	Microbial Biotechnology	3
	BIOL5400	Bioinformatics	3
	BIOL5004	Graduation Research Project	3
		Major Elective	3
		Major Elective	3
	Total		**15**

Semester 8 Spring	BIOL5133	Plant Biotechnology	3
	BIOL5433	Bioprocess Technology	3
		Major Elective	3
		Major Elective	3
		Major Elective	3
	Total		**15**

According to the Self-Assessment Report, the following **Programme Learning Outcomes (PLO)** shall be achieved by the Bachelor's degree programme Environmental Biology:

a. Be able to demonstrate their knowledge in general biological concepts as well as knowledge in the area of Environmental Biology.

b. Be aware of contemporary issues able to apply knowledge and skills to investigate and solve problems related to Environmental Biology.

c. Be able to communicate (verbally or in writing) their biological knowledge to various levels of audience with regard to the field of Environmental Biology.

d. Demonstrate high level of ethical and social conduct in the practice of their profession and awareness of occupational health and safety issues related to the workplace.

e. Be able to learn independently and become a lifelong learner.

f. Be able to work well independently and/or in a team.

g. Be able to engage in supporting community affairs relevant to Environmental Biology.

The following **curriculum** is presented:

	Course Code	Course Title	Cr.
Semester 1 Fall	SOCY1005 or SOCY1007	State and People, or Omani Contemporary Society (For Non-Omanis)	2
	LANC2058	Communication in Science	3
	BIOL2101	General Biology I	4
	CHEM2101	General Chemistry I	4
		University elective	2
	Total		**15**

Semester 2 Spring	ARAB1060 or ARAB1019	Arabic, or Arabic for Non-Arabic Speakers	2
	HIST1010 or ISLM1010	Oman and Islamic Civilization or Islamic Culture	2
	BIOL2102	General Biology II	4
	BIOL2900	Experimental Design and Basic Biological Data Handling	3
		College elective	4
	Total		**15**

Semester 3 Fall	BIOL3005	Ecology	3
	BIOL3011	Plant Physiology	3
	BIOL3202	Molecular Biology	3
	BIOL3700	Communication and knowledge management in science	2
		University Elective	2
		University Elective	2
	Total		**15**

Semester 4 Spring	BIOL3009	Introduction to Environmental Science	3
	BIOL3410	Angiosperm Biology	3
	BIOL3441	Introductory Microbiology	3
	BIOL3030	Population genetics	3
	BIOL3023	Animal Physiology	4
	Total		**16**

Semester 5 Fall		College elective	4
	BIOL4010	Sustainability and waste management	3
	BIOL4021	Vertebrate Zoology	3
	BIOL4054	Marine Biology	3
		Major Elective	3
	Total		**16**

Semester 6 Spring	BIOL4100	Biological Data Handling	3
	BIOL5610	Environmental impact assessment	3
	BIOL5010	Ecotoxicology	3
		Major Elective	3
		Major Elective	3
	Total		**15**

Semester 7 Fall		Major Elective	3
	BIOL5021	Desert Biology	3
	BIOL5052	Freshwater Biology	3
		Major Elective	3
	BIOL5003	Graduation Research Skills	1
		Major Elective	3
	Total		**16**

Semester 8 Spring	BIOL5054	Conservation Biology	3
	BIOL5004	Graduation Research Project	3
	BIOL4601	Occupational Health, Safety and Environment	2
		Major Elective	3
		Major Elective	3
	Total		**14**

According to the Self-Assessment Report, the following **Programme Learning Outcomes (PLO)** shall be achieved by the Master's degree programme Biology:

1. Demonstrate the individual and collaborative skills necessary for designing and implementing research activities using appropriate methodologies, and the ability to analyze results and disseminate findings.
2. Exercise critical thinking in relation to ethical and cultural behavior, research, and professional issues in local and global contexts.
3. Demonstrate leadership skills, responsibility and the ability to have a positive influence on others, especially in areas related to their specialization, i.e., biotechnology and omics sciences.
4. Demonstrate positive attitudes towards independent and continuous professional development and lifelong learning.
5. Apply advanced comprehensive skills and knowledge in the area of their specialization and demonstrate the ability to transfer these across various fields.
6. Communicate effectively with specialist and non-specialist audiences.
7. Find, collect, analyze, critically assess, synthesize and manage high-level, reliable information from a variety of sources using appropriate skills and technologies.
8. Acquire and demonstrate safe use and handling of equipment and biological material.
9. Be capable of independent practical work in laboratories.
10. Understand the potential social, ethical, and environmental implications of their actions.
11. Have acquired new knowledge in transdisciplinary, subject-relevant, or core disciplines.
12. Gained problem-solving competence in fields relevant to biotechnology.

The following **curriculum** is presented:

Core Courses		
Course Code	**Course Title**	**Credits**
BIOL6400	Biological Instrumentation and Analyses	3
BIOL6700	Bioproducts and Bioeconomy	3
BIOL6210	Biostatistics	3
BIOL6800	Multiomics	3
BIOL6226	Scientific communications	3
Total		

Elective Courses		
Course Code	**Course Title**	**Credits**
BIOL5120	Microbial Biotechnology	3
BIOL5133	Plant Biotechnology	3
BIOL5400	Bioinformatics	3
BIOL5401	Modern Techniques in Environmental Microbiology	3
BIOL5411	Fermentation Technology	3
BIOL5433	Bioprocess Technology	3
BIOL5501	Protein Production and Characterization	3
BIOL5600	Techniques in Molecular Diversity	3
CROP6011	Fungal Infection of Plants	3
MASF6007	Marine Biotechnology	3
MICR6005	Immunology	3
ENVR6005	Environmental Management and Analysis	3
PLNT6009	Plant virology	3
SWAE6009	Advanced Topics in Soils, Water and Agricultural Engineering	3
Total		9

Thesis		
Course Code	**Course Title**	**Credits**
BIOL7002	Biology MSc Thesis	6
Total		6