ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Environmental Biology
Biotechnology

Provided by
Sultan Qaboos University Muscat, Sultanat of Oman

Version: 9th December 2016

Table of Content

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]
Ba Biotechnology	--	ASIIN	none	10
Ba Environmental Biology	--	ASIIN	none	10
Date of the contract: 30.12.2014 **Submission of the final version of the self-assessment report:** 22.06.2015 **Date of the onsite visit:** 05. – 09.10.2015 **at: Muscat, Sultanat of Oman**				
Peer panel: Prof. Dr. Ulrich Hahn, University of Hamburg Prof. Dr. Rolf Heumann, University of Bochum Sabine Huck, Umweltbundesamt (UBA) Prof. Dr. Matthias Mack, University of Applied Sciences Mannheim Mustafa Al-Ajmi, Student, German University of Technology in Oman				
Representative of the ASIIN headquarter: Rainer Arnold				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used:				

[1] ASIIN Seal for degree programmes
[2] TC 10 – Life Sciences

European Standards and Guidelines as of 10.05.2015 ASIIN General Criteria as of 04.12.2015 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 09.12.2011	

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	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
B.Sc. Biotechnology	Bachelor of Science	-	6	Full time	No	5 years	122 Omani Credit Points	Fall semester/Spring Semester 20.10.2014
B.Sc. Environmental Biology	Bachelor of Science	-	6	Full time	No	5 years	122 Omani Credit Points	Fall semester/Spring Semester 20.10.2014

For the Bachelor's degree programmes Biotechnology and Environmental Biology SQU has presented the following profile on its homepage:

"Biology is the scientific exploration of the vast and diverse world of living organisms; simply put, it is the study of life. Today, biological research, worldwide, extends from the microscopic scale of the molecules and cells that make up organisms to the global scale of the entire living planet. The study of biology not only solves puzzles about ourselves and about the millions of other organisms with whom we share this planet Earth, but also provides us with solutions to many problems facing our civilization from human diseases to loss of biodiversity and environmental quality to providing us with the much needed resources taking into account environmental problems that this may cause.

Upon successful completion of their degrees, undergraduate and graduate students from the Department of Biology continue to serve Oman by working in either the public or private sectors."

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

C Peer Report for the ASIIN Seal

1. The Degree Programmes: Concept, content & implementation

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

Evidence:

- Self Assessment Report
- Objectives-Modules-Matrix
- Homepage of the SQU: http://www.squ.edu.om/

Preliminary assessment and analysis of the peers:

The auditors hold the view that the objectives and intended learning outcomes of the Bachelor degree programme Environmental Biology are comprehensive and well founded: The students acquire a sound fundamental basis in environmental and biology-relevant knowledge of mathematics and natural sciences. They gain methodological competence in the environmental and biological sciences and are able to carry out practical work in laboratories. They are also able to solve subject-relevant problems and can present the results. In addition they have trained their analytical and logical abilities and have an awareness of possible social, ethical and environmental effects of their actions. During the course of their studies, the students have also acquired communicative skills, can work in a team and have developed a strategy for life-long learning.

The auditors are convinced that the intended qualification profile of the Bachelor degree programme Biotechnology is reasonable and useful: The students are capable to navigate in the space of modern biotechnology, know the latest developments, research trends and their practical implementation in industrial, medical, agricultural and environmental biotechnology. In addition they can work in a team, have sufficient communicative skills and acquire fundamental knowledge and competences in molecular biotechnology, cell and organism biology and have developed a strategy for lifelong learning.

The objectives and learning outcomes of the degree programmes are accessible to the students via the Students Information System, which is an online information platform.

Finally the peer group judges the objectives and learning outcomes of the degree programmes to reflect the intended level of academic qualification and to correspond with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences.

The auditors are convinced that the graduates of the Bachelor degree programmes obtain all necessary fundamental knowledge and competences for a professional career in the areas of modern biology (molecular and cell biology, genetic engineering, genomics, molecular medicine), biotechnology (cell and tissue engineering, bioengineering, biosynthesis) or modern ecology (industrial ecology, social ecology, economics of natural resources).

The peers notice that the graduates of the Bachelor degree programmes are able to continue their tertiary education either at SQU or at an HEI in a foreign country. This continuation may take place immediately after graduation or, depending on the career planning of the student, after a period of practical work in the industry or the public sector. The Biotechnology graduates are mainly employed in laboratories: in various Ministries, in the private sector (such as the oil and gas industry); others become lecturers and technicians at SQU and other HEIs. Most of the graduates of the Environmental Biology degree programme will be employed by the Ministry of Environment.

In summary the auditors are convinced that the intended qualifications profiles of all degree programmes allow the students to take up an occupation which corresponds to their qualification. The degree programmes are designed in such a way that they meet the objectives set for them, including the intended learning outcomes. They appreciate that SQU aims for high standards as to give their students good chances in the national and international job market as well as a good starting point to transfer to other academic programmes to complete a Master and maybe even a PhD-programme.

The auditors confirm that while developing the objectives and learning outcomes the HEI has also taken into account the situation of the national job market. In addition, the relevant stakeholders were included in the process of formulating and further developing the objectives and learning outcomes.

Criterion 1.2 Name of the degree programme

Evidence:

- Self Assessment Report
- Biotechnology and Environmental Biology Degree Plan

Preliminary assessment and analysis of the peers:
The auditors hold the view that the name of the Bachelor degree programme Environmental Biology corresponds well with the intended aims and learning outcomes as well as the main course language.

On the other hand the auditors notice that the name of the Bachelor degree programme Biotechnology is somewhat misleading, because only a few courses in engineering can be chosen as university electives. The peers suggest to include at least some engineering courses as compulsory courses in the biotechnology curriculum. Although there is an Engineering College at SQU, no courses in Process Engineering, Material Sciences, Bioreaction Design or Process Automation are offered. The Biology department is willing to introduce more technical subjects into the curriculum of the Biotechnology programme and is highly interested in cooperating with the College of Engineering. A list of relevant engineering courses has been distributed by a SQU faculty member from the biology department and the peers would highly appreciate if these courses would be included in the curriculum. Thus SQU has already realized that these courses are relavant to a biotechnology degree. So far no progress was achieved, because the College of Engineering at the moment is not willing (or possibly not able) to offer courses for the Biology department. The peers therefore encourage the department to intensify the cooperation within SQU. The goal should be to offer engineering courses in cooperation with the College of Engineering to ensure the required technical training of biotechnology students.

Criterion 1.3 Curriculum

Evidence:

- Self Assessment Report
- Objectives-Modules-Matrix
- Module descriptions
- Biotechnology and Environmental Biology Degree Plan

Preliminary assessment and analysis of the peers:

The curriculum for the Bachelor degree programme Biotechnology contains General Compulsory Modules (e.g. Oman & Islamic Civilization or Islamic Culture, Arabic, Communication in Science), Compulsory Modules (e.g. Molecular Biology, Plant Physiology, Microbiology, Biochemistry, Immunology, Cell Biology), Elective Modules from the Biology Department (e.g. Animal Histology, Plant Biotechnology, Bio-Informatics, Protein Bio-

technology) and University Elective Modules (e.g. Principles of Teaching, Introduction to Economics, Human Rights in Islam). The complete list of all compulsory and elective modules can be found in the curricular overview of the Bachelor degree programme Biotechnology.

The curriculum for the Bachelor degree programme Environmental Biology contains General Compulsory Modules (e.g. Oman & Islamic Civilization or Islamic Culture, Arabic, Communication in Science), Compulsory Modules (e.g. Ecology, Marine Biology, Microbiology, Principles Of Toxicology, Molecular Biology, Genetics), Elective Modules from the Biology Department(e.g. Waste Management, Biological Conservation, Environmental Impact assessment) and University Elective Modules (e.g. Principles of Teaching, Introduction to Economics, Human Rights in Islam). The complete list of all compulsory and elective modules can be found in the curricular overview of the Bachelor degree programme Environmental Biology.

The peers 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 5 years by the curriculum committee, which adds and removes courses.

All students that enter SQU must decide at which College they want to study. At the College of Science the fundamentals of natural sciences like biology, chemistry and physics as well as mathematics and informatics are taught in the first year of studies and provide the students with the necessary knowledge in those areas. In addition they must take classes in English. After the first two semesters the students can select a major (e.g. Biology, Chemistry, Physics) and begin the Bachelor 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 Science College.

The peers 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 auditors inquire about the employment perspectives of the graduates, they learn that some graduates work as teachers in high school but most find adequate jobs in the public sector (e.g. ministries, laboratories). Since the biotechnology industry is not well developed in Oman yet, only some students find jobs in companies (e.g. oil and gas industry).

Graduates can stay in Oman, but some look for opportunities to find jobs abroad. SQU analyses opportunities and possible future developments, conducts market surveys and talks with representatives from the public sector to find out about the needs and demands of employers. The development of human resources is a very important issue in Oman and SQU tries to provide the necessary means to achieve this goal. In addition, SQU follows the career of its graduates and tries to keep in contact with them.

In summary the peer group draws the conclusion that the curricula of the Bachelor degree programme Environmental Biology and the Bachelor degree programme Biotechnology allow the students to achieve the intended learning outcomes.

Criterion 1.4 Admission requirements

Evidence:

- Self Assessment Report
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:

The admission to the Bachelor degree programmes depends 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. To enter a college and chose a major, a student must complete the university requirements during the first two semesters. The detailed admission requirements are written down in the SQU Undergraduate Academic Regulations that are published every other year and that are available on the HEIs homepage.

In summary the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

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

The Biology Department points out that there are already some PhDs with some experience in engineering on the teaching staff who will offer new biotechnology courses with an engineering component. In addition the Biotechnology degree programm for 2016 will include electives from the College of Engineering and currently there are talks with the College of Engineering about introducing new core courses more relevant to Biotechnolo-

gy. Since these core courses would not get approval in time for the 2016 degree programme they would need to be introduced later.

The peers appreciate the plans of the Biology Department to offer more courses with an orientation towards engineering in the bIotechnology degree programme and wait to see if the curriculum for 2016 is going to be changed accordingly.

2. The Degree Programmes: Structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self Assessment Report
- Objectives-Modules-Matrix
- Handbook of Biology Courses
- Biotechnology and Environmental Biology Degree Plan
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:
The peers notice that the degree programme is not always presented in a modular form. They want to encourage the HEI to think about breaking down the traditional barriers between the biological sub-disciplines and to combine courses so that coherent learning units can be created. Each course should be a package of connected learning units grouped in compulsory and elective sections.

From the auditors point of view the structure of the degree programme ensures that the qualification level and the intended learning outcomes can be achieved and that the students can complete the degree programmes successfully without any delay.

SQU has guaranteed in its Undergraduate Academic Regulations the recognition of credits gained at other institutions if they have been obtained according to the terms of a learning agreement. The student and a representative of SQU have to agree upon the learning agreement prior to the stay abroad. The peers thus conclude that there are transparent rules for recognizing achievements and competences acquired outside the HEI.

The auditors see that there a no intervals of practical work integrated into the curriculum. Students can do practical work during the summer months but it is purely voluntary and no credits are awarded. The peers suggest that the contacts made during internships are very valuable to the students and improve their chances to find a suitable job after graduation, so that it might be useful to encourage and to support the students to do more practical work outside the university. The peers learn that there are only a few companies that offer suitable internships for students from the Biology Department and the students are supported and get advice if they want to do an internship. But since the opportunities are so limited in Oman it would be impossible to make this a compulsory part of the curriculum. Although practical training is voluntary, the university tries to help the students to find suitable internships. In addition, members of the teaching staff have personal contacts to companies that their students can utilize.

The peers understand these limitations and suggest that it should be possible to award credits for the internships, so that these students need to take less courses during the semester.

In the eyes of the peer group the most critical aspect of the Biotechnology and Environmental Biology degree programmes is the fact, that there is no compulsory Bachelor Thesis within the curriculum. They learn that only approximately 10 to 15% of the most motivated students choose the courses “Research project 1” and “Research project 2”. These courses are only electives and present the only chance for students to get involved with research projects, but the peers think it is absolutely necessary for all Bachelor students to take part in research projects. This issue will be discussed in more detail under Criterion 3 (Exams).

During the meeting with the peer group the students of the Environmental Biology degree programme express the wish to broaden the degree plan and to offer an Environmental Sciences degree programme that could include more modules in waste management, air and water treatment and air pollution. Since air and water quality are very important issues in Oman, the auditors think that the establishment of a degree programme in Environmental Sciences may be a good idea and encourage the Biology Department to think about this suggestion seriously.

The peers learn that the Biology Department wants to introduce more technical courses into the Biotechnology degree programme. They have already contacted the Department of Chemical and Petroleum Engineering and want to offer electives in e.g. “Material Engineering”, “Engineering Thermodynamics”, “Polymers” and “Chemical Process Industries”. The peers appreciate the intention to introduce more engineering courses and encourage the Biology Department to pursue this plan.

The peer group concludes that the courses have been adapted to the requirements of the degree programmes and they confirm that the module objectives generally help to reach the qualification level and the overall intended learning outcomes.

Criterion 2.2 Work load and credits

Evidence:

- Self Assessment Report
- Handbook of Biology Courses
- Biotechnology and Environmental Biology Degree Plan
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:
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 1 h of lecture or 3 h of practical work per week, the semester consists of 15 weeks. Thus a 3 credit course is normally 2 lectures (of 50 min) plus a 3 h 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 peers learn that most students finish their degree after 8 or 9 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.

A critical issue is the missing ECTS conversion. The current Omani credit point system does not take into account the actual amount of work required by the students. It only sums up the attendance-based learning time in the lectures and laboratories. But it is also necessary to consider the time the students spend outside the classroom on self studies and course preparation. For this reason a work load based credit point system should be devised. The work load should include the independent educational work of a student: essays, reports, term papers (projects), laboratory work, and preparation on the different

types of exams, collection of materials and writing of a final thesis. As a result, all compulsory and elective modules of the degree programmes should be included in the work load.

The auditors suggest introducing a work load survey which could be connected to the course evaluation that takes place every semester. It is important to have clear regulations about how the students' work load is converted into credits. When defining the work load of a module it should be taken into account that the total work load of a 1 h lecture is usually different from the total workload of 1 h of practical work in laboratory. SQU can initially estimate the work load for the average student but of course this will not necessarily be correct; thus there should be defined mechanisms for continuous student feedback on the actual workload and the use of this feedback to correct the structure of the degree programmes if necessary.

While the national Omani credit point system can of course be used alongside ECTS credits, it is necessary to introduce the workload based ECTS and to provide transparent regulations for the conversion from on credit point system to the other.

In summary, the auditors conclude that there seems to be no structural pressure on the quality of teaching and the level of education due to the work load. The work load appears to be realistic, and the students are able to complete the degree programme without exceeding the regular time frame.

Criterion 2.3 Teaching methodology

Evidence:

- Self Assessment Report
- Handbook of Biology Courses

Preliminary assessment and analysis of the peers:
According to the Self Assessment Report all courses have a course outline (that is handed out to the students at the beginning of each semester), a textbook (provided for free), lecture notes and lab manuals and an online Moodle site (providing further information such as links to videos and animations, past exam and test papers).

During their visit of the laboratories the peers learn that the experiments in the lab are always prepared by lab technicians and that students just have to conduct the experiment. For this reason, the peers suggest that it might be useful for the students to pre-

pare the experiment on their own, so that they get more practical experience and learn how to properly use the technical equipment. In addition, the students expressed the wish to get an individual feedback of the teachers on the presentations and group projects. The peers support this suggestion and ask the teaching staff to assess this idea.

In summary, the peer group judges the teaching methods and instruments to be suitable to support the students in achieving the learning outcomes. Moreover, they consider the degree programmes to be well balanced between attendance based learning and self-study.

Criterion 2.4 Support and assistance

Evidence:

- Self Assessment Report
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:
SQU provides a support system for all students with regard to studies. It includes consultations with academic advisors about the individual study programme plan. In addition, there is a Student Counselling Centre for the university and an advisor for student affairs in each department.

The peers learn that the members of the teaching staff are available on any issues regarding the degree programmes and offer academic advice. They appreciate this “open door policy”.

The peer group notices the good and trustful relationship between the students and the teaching staff; 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 most important support the students receive from SQU is the financial support. The peers were pleased to hear, that all undergraduate studies at SQU are funded by the government, which means that every student gets a scholarship for the living expenses and that all undergraduate studies are free of tuition.

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

The Biology Department thanks for the helpful comments on the degree programme, but they think that their courses are presented in a modular form and they already are combining lectures and practicals into a module, which they call a "course".

The Biology Department will investigate the possibility of giving credits to internships. Already, many students are enthusiastic about doing internships on a voluntary basis, but the limitation is in training opportunities. There are few biotechnological industries and although they may be willing to take students on a one-off basis, are unwilling to do it year after year.

The peers understand the limitations and do not want the internships to become a mandatory part of the curriculum.

The Biology Department wants to clarify that during most of the practicals the students prepare the experiments on their own. The technicians only put out the chemicals and other materials.

An Environmental Sciences programme has been under discussion for some time and plans are put into motion to design a new programme without any direct "Department ownership", but it will take some time to finalize the plans.

It is planned to introduce into both 2016 degree plans a compulsory Bachelor research thesis, in which the student will do an individual research project. This will be assessed by a written thesis, a seminar and an oral viva. The degree plans have been passed by the Department and by the College, but they still need approval by the University for introduction next fall semester (2016).

The peers are glad to hear, that a Bachelor thesis will be part of the mandatory curriculum in both degree programmes and will check the new degree plans next year.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self Assessment Report
- Handbook of Biology Courses

- Biotechnology and Environmental Biology Degree Plan
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:
According to the Self Assessment Report theory taught in the lectures is usually examined by 2 tests (typically in week 6 and week 10 of the semester) making up 30% of the overall grade and a 3 h final exam (40%). The practical work makes up to 30% of the final grade and may be assessed in a variety of ways, depending on the nature of the course. Exams usually consist of a mixture of question types, typically involving multiple-choice and short answer or longer essays. 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). Handicapped students are very unusual in lab-based degree programmes, but would be handled by the university on a case by case situation. Exam timetabling is handled centrally by a computer, so direct clashes are unusual, but there may be bunching of exams for a student. The regulations state that if the student has 3 exams in 2 days or 4 exams on consecutive days, then a supplementary exam must be offered on a different day in order to avoid too much pressure on the student. The exam timetable is linked to the course timetable, so the student knows the time of the final exam at the time of course registration. At the start of the course, the student is given a course outline which includes details of the course assessment. The final grade is ranked in accordance to the international ECTS grade system with letters in descending order, from “A” to “F”. There is also an ongoing monitoring of the students progress in his studies, it is evaluated by the teaching staff on the basis of attendance and preparedness for the classes (quizzes at the beginning of the laboratories). 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 peers confirm that there is a form of assessment for each course and that all students are well informed about the form of assessment and details of what is required to pass the module. The rules for re-sits, disability compensation, illness and other circumstances are written down in the SQU Undergraduate Academic Regulations and therefore transparent to all stakeholders.

During the meeting with the students, the peers learn that some of the students complain about the number of quizzes during the first semesters. Since there are fewer quizzes in the advanced classes, and the quizzes were designed to make sure that the students are well prepared for the laboratory work, the peers judge this form of exam to be adequate and do not recommend any changes.

As mentioned before, part of the compulsory curriculum should be an individual research project, the result of which should be documented in the form of a written report and an oral presentation. This report is usually called “Bachelor Thesis”. Projects leading to the Bachelor Thesis could well involve teamwork, as this is an important aspect of employability which is often neglected in traditional biology degree courses. Thesis presentation can be used as a tool for improving presentation skills.

The academic goal of a bachelor degree programme in Biotechnology or Environmental Biology is to give all the graduates an initial research experience, and not to only offer this opportunity to the most qualified top 10 – 15% of the students. The intention of the Bachelor Thesis is for the graduate to successfully complete an individual research project. This is important not only for those going on to further studies, but also for those leaving the HEI with a Bachelor`s degree, for whom it is vital that they have personal first-hand experience of what research is about. The quality standards, the supervision and the form of assessment of the Bachelor Thesis should be transparent. Keys to a successful Bachelor Thesis are the intellectual and scientific input of the student, the comprehension of the project, organization and planning besides a well-written report.

The peers inspect a sample of examination papers and are overall satisfied with the general quality of the samples.

The peers come to the conclusion that besides the critical issue of a non-compulsary Bachelor Thesis the ASIIN criteria regarding the examinations system, concept, and organization are fulfilled.

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

The peers are glad to hear, that a Bachelor thesis will be part of the mandatory curriculum in both degree programmes and will check the new degree plans next year.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self Assessment Report
- Staff handbook

Preliminary assessment and analysis of the peers:
The peers notice that the Biology Department has an international academic staff, with teachers coming from Oman and several other countries (e.g. UK, Sudan, Germany, India), and is well-equipped for teaching, with sufficient laboratories, lecture halls, and PC-working rooms.

The auditors notice that the composition and qualification of the teaching staff is suitable to sustain the Bachelor degree programmes. They also confirm that enough resources are available for administrative tasks and supervision and guidance of the students. They learn that there is no reduction of the teaching load if a staff member advices more students and that the teaching load is between 10 to 12 hours of teaching during the week. In order to reduce the work load of the teaching staff the peers recommend to hire more teaching assistants and post docs, which could supervise the laboratory work. It would also be helpful if more scholarships for PhD and Masterstudents were available.

The auditors are very impressed by the excellent and open minded atmosphere among the students and the staff members. The teaching staff is open minded and always focused on improving the quality of the degree programmes.

Finally the auditors notice that the teaching staff is primarily concerned with giving lectures and supervising practical work in the laboratory. Time for research activities is limited but overall sufficient to support the level of academic qualification aimed at.

Criterion 4.2 Staff development

Evidence:

- Self Assessment Report
- Staff handbook

Preliminary assessment and analysis of the peers:
The peers learn that there is a Centre for Staff Development responsible for Omani staff. The number of staff positions in a department is determined by the number of students taught. The technical staff members (who are entirely Omani) are also funded to attend training courses overseas, depending on departmental needs.

New teachers can take part in workshops to improve their didactic skills and learn how to advice students. For this purpose SQU has set up the Center of Excellence for Teaching

and Learning, which will provide courses for staff members. In addition, it is also possible for staff members to take part in conferences and workshops abroad.

The peers notice that mentoring (by senior lecturers) for new staff members is already in place and that it is also planned to bring back retired teachers as mentors.

In summary the auditors confirm that with the establishment of the Center of Excellence SQU offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and teaching skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self Assessment Report.
- On-site-visit of the laboratories

Preliminary assessment and analysis of the peers:

During the audit the peer group also visits the laboratories in order to assess the quality of infrastructure and technical equipment. They notice that there are no bottlenecks due to missing or out of date equipment or a lacking infrastructure. The technical equipment is up to date and available in sufficient numbers. A new building for the Biology Department was opened last year so there are also enough laboratories and research facilities. The only problem is the extensive Omani bureaucracy. The import of chemicals and other technical equipment sometimes may take 1 year because several authorisations and permits are required by Omani bureaucracy.

In the SQU library the students have access to electronic scientific and educational resources and to the electronic library system, including current publications that are needed for study and research.

During the meeting with the peers the students complain about missing study areas in the Biology department. The peers ask the head of the department about this issue and are told that the department already knows about this problem and is trying to solve it. Right now the students have to either use the central library (which is in another area of the campus) or the study areas of other departments. The representatives of the Biology department agree that there should be sufficient learning rooms for the students, which would also be positive for the atmosphere in the department. In addition, they plan to set up a printer for the use of the students.

The peers notice that several of the students want to found their own company after graduation. They applaud these plans and want to know in which way SQU helps these students. They learn that classes in entrepreneurship are offered and a competition between students who want to found a company and have a business plan exist. Moreover, the idea of a science park close to the university has already been put forward, but so far no practical realization has taken place.

Otherwise the students express their general satisfaction with the available resources and conditions of studying, thereby confirming the positive impression of the peer group.

The auditors conclude that there are sufficient funds and equipment and that the infrastructure (laboratories, library, seminar rooms etc) complies with the requirements for sustaining the degree programmes.

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

The Biology department strongly supports to hire more teaching assistants and post docs and has been arguing for years, supported by many External Examiners, about the need for more scholarships and thus more teaching assistants. However, the College budget is limited and not more funds are available for hiring staff.

The peers understand the financial limitations but want to encourage the Biology department to further pursue this plan and to speak with the College of Science about this issue.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self Assessment Report
- Handbook of Biology Courses
- Biotechnology and Environmental Biology Degree Plan

Preliminary assessment and analysis of the peers:

The auditors confirm that the module descriptions are accessible to all students and teachers via the online platform “Platonus”. As mentioned before, the auditors complain that midterm exams and ongoing monitoring are not mentioned in the module descrip-

tions. Finally the auditors notice, that the names of the teachers are not specified in the module descriptions. This information must be added.

The auditors take a closer look at the course handbook and the module descriptions and find that they do not contain all required information and need to be adjusted. In particular they notice that the details explaining how the module mark is calculated are missing and that there is sometimes no reading list (e.g. BIOL 5501, BIOL 5610, BIOL 5052, BIOL 5031, BIOL 5021) provided.

All the missing information is available to the students via the course outlines that are handed out to them at the beginning of each semester. This information should also be included in the course handbook.

In addition the peers ask the University to provide the module descriptions for all courses (including the electives) and not only those of the Biology Department.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

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

Preliminary assessment and analysis of the peers:
The peer group notices that no Diploma Supplement is issued after graduation. Instead the graduates receive a Transcript of Records (in English) detailing the grades in every course and the overall final grade. The student is also given a certificate that can be used in job applications.

The auditors point out that a Diploma Supplement should be issued in Arabic and English and should inform about the structure and content of the degree programme. It should provide information about the individual performance as well as statistical data regarding the final mark and information about the composition of the final mark. This allows the reader to categorize the individual result.

The peers insist that all graduates of the degree programmes must be provided with a Diploma Supplement, it should be automatically issued together with the HEI`s diploma after the graduation. The graduates benefit from this standardized document because this way their academic qualification is more easily recognized abroad, the description of

their academic career and the competencies acquired during their studies are included, and it offers them easier access to opportunities for work or further studies abroad. Graduation represents the culmination of the students' period of study. Students need to receive documentation explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed.

Criterion 5.3 Relevant rules

Evidence:

- Self Assessment Report.
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:
The auditors confirm that the rights and duties of both the HEI 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 peers after the comment of the Higher Education Institution regarding criterion 5:

The Course outlines for non-biology courses from other science departments that are required by Biotechnology and Environmental Biology majors and the Biology Course Handbook has been provided by the Department of Biology.

The peers recognize that information about the composition of the final grade and the names of the teachers are now included, but the literature references are still missing.

6. Quality management: Quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self Assessment Report.
- SQU Undergraduate Academic Regulations

Preliminary assessment and analysis of the peers:
The auditors ask the head of the Biology Department about the quality management system at SQU. 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 evaluation. 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 student course assessment (an on-line questionnaire) and via direct communication with the teaching staff.

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 a university advisory board where representatives from ministries and companies discuss with the College Deans their needs and wishes according to the demands of the labor market.

Currently, there is no feedback to the students about the course evaluation, but the student liaison committee serves this purpose. There are ten students one male and one female from each year and they give a substantial feedback about the quality of the courses to the department. During the meeting with the students, the peers learn that not all the students know their representatives on the liaison committee. Therefore it would be a possibility to announce officially which students are members of the liaison committee and how they can be contacted.

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. The course evaluation aims to continuously improve the degree programmes and to create a supportive and effective learning environment for students.

The auditors gain the impression that the feedback is taken seriously by the teaching staff and changes are made if there is negative feedback. They confirm that the Biology Department regularly monitors and reviews the Biotechnology and Environmental Biology degree programmes to ensure that they achieve the objectives set for them and respond to the needs of students and Omani society.

When there is negative feedback in the student course evaluations, the Biology department first talks to the involved teacher, analyses the problems and offers guidance. If problems do not get solved the teacher recieves an official warning and as a last resort non-Omani staff members may have to leave the university.

The peers confirm that policies and processes are in function at SQU that form a cycle for continuous improvement and contribute to the accountability of the HEI. It supports the development of quality culture in which all internal stakeholders assume responsibility for quality and engage in quality assurance at all levels of the HEI.

In summary the peer group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programmes. The students and all other stakeholders are involved in the process.

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

The Biology Department points out that the course evaluations have a low validity, because only few students take part. They want to improve the validity by persuading more students to complete the assessment. Then they will investigate a mechanism by which the students will get a feedback.

The peers think that the students can be motiviated and convinced to take part at the course evaluations by giving them substantial feedback and by taking their suggestions seriously.

D Additional Documents

Before preparing their final assessment, the panel asks 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:

1. Module descriptions for all courses from outside the Biology Department (including the electives).

E Comment of the Higher Education Institution (17.11.2015)

The institution provided a detailed statement as well as the following additional documents:

- Course outlines for non-biology courses from other science departments that are required by Biotechnology and Environmental Biology majors
- Biology Course Handbook

F Summary: Peer recommendations (23.11.2015)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Biotechnology	With requirements for one year	--	30.09.2021
Ba Environmental Biology	With requirements for one year	--	30.09.2021

Requirements

For all degree programmes

A 1. (ASIIN 5.2) A Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student must be issued to every graduate.

A 2. (ASIIN 3) The degree programme must comprise a thesis or final project for all students. A concept how an individual research project is introduced into the curriculum as a compulsory module must be presented.

A 3. (ASIIN 2.2) A credit point system that is based on the amount of work the students spend on each module (work load) must be devised.

Recommendations

E 1. (ASIIN 5.1) It is recommended that the module descriptions should include a list of relevant literature references.

E 2. (ASIIN 5.2) It is recommended to provide information about the composition of the final grade in the Diploma Supplement, so that it is transparent for third parties which academic courses are entered into the final grade and to what extent.

E 3. (ASIIN 2.2.) It is recommended to determine the actual workload of the students via work load surveys.

For the Biotechnology degree programme

E 4. (ASIIN 1.2, 1.3) It is recommended to introduce more technical subjects into the Curriculum.

G Comment of the Technical Committee 10- Life Sciences (26.11.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical committee follows the recommendations of the peer group.

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

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditaiton**
Ba Biotechnology	With requirements for one year	--	30.09.2021
Ba Environmental Biology	With requirements for one year	--	30.09.2021

H Decision of the Accreditation Commission (11.12.2015)

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

The Accreditation Commission discusses the procedure and agrees with the analysis of the peers and Technical Committee.

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Biotechnology	With requirements for one year	--	30.09.2021
Ba Environmental Biology	With requirements for one year	--	30.09.2021

Requirements

For all degree programmes

A 1. (ASIIN 5.2) A Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student must be issued to every graduate.

A 2. (ASIIN 3) The degree programme must comprise a thesis or final project for all students. A concept how an individual research project is introduced into the curriculum as a compulsory module must be presented.

A 3. (ASIIN 2.2) A credit point system that is based on the amount of work the students spend on each module (work load) must be devised.

Recommendations

E 1. (ASIIN 5.1) It is recommended that the module descriptions should include a list of relevant literature references.

E 2. (ASIIN 5.2) It is recommended to provide information about the composition of the final grade in the Diploma Supplement, so that it is transparent for third parties which academic courses are entered into the final grade and to what extent.

E 3. (ASIIN 2.2.) It is recommended to determine the actual workload of the students via work load surveys.

For the Biotechnology degree programme

E 4. (ASIIN 1.2, 1.3) It is recommended to introduce more technical subjects into the Curriculum.

I Fulfilment of Requirements (09.12.2016)

Analysis of the peers and the Technical Committee (28.11.2016)

For all degree programmes

A 1. (ASIIN 5.2) A Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student must be issued to every graduate.

First Treatment	
Peers	fulfilled justification: The university has provided a sample Diploma Supplement that includes all necessary information.
TC 10	fulfilled

A 2. (ASIIN 3) The degree programme must comprise a thesis or final project for all students. A concept how an individual research project is introduced into the curriculum as a compulsory module must be presented.

First Treatment	
Peers	fulfilled justification: The university has introduced a compulsory final thesis for all students.
TC 10	fulfilled

A 3. (ASIIN 2.2) A credit point system that is based on the amount of work the students spend on each module (work load) must be devised.

First Treatment	
Peers	fulfilled justification: The university has established a credit point system that is based on the students` work load.
TC 10	fulfilled

Decision of the Accreditation Commission (09.12.2016)

The university has provided a sample Diploma Supplement that includes all necessary information, has introduced a compulsory final thesis for all students, and established a credit point system that is based on the students` work load. The Accreditation Commission follows the assessment of the peers and the Technical Committee 10 – Life Sciences and considers all requirements to be fulfilled.

The Accreditation Commission for Degree Programmes decides the prolongation of the accreditation as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Environmental Biology	All requirements fulfilled	n.a.	30.9.2021
Ba Biotechnology	All requirements fulfilled	n.a.	30.9.2021

Appendix: Programme Learning Outcomes and Curricula

According to the Self Assessment Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programmes Biotechnology and Environmental Biology:

"The students receive a fundamental knowledge in biological sciences, can follow new directions in modern biology and are able to apply their knowledge in scientific activities.

The graduates acquire:

- an ability to design and conduct experiments, as well as analyze and interpret data
- an ability to function in multidisciplinary teams
- an ability to identify and solve applied science problems
- an understanding of professional and ethical responsibilities
- an ability to communicate effectively
- a knowledge of contemporary issues
- an ability to use the techniques, skills and modern applied science tools necessary for professional practice

In addition the specific learning outcomes for the Bachelor degree programme Biotechnology encompass the ability to:

- use the scientific methods to define and solve problems independently and collaboratively
- illustrate the correlation between structure and function at all levels of organization (organism, tissue, cells organelles and biomolecules)
- visualize the importance of genomics, proteomics of prokaryotic and eukaryotic cells and their application in biotechnology and in human welfare
- know the differences in the genomics, proteomics of prokaryotic and eukaryotic cells which can be used in biotechnology

- demonstrate an understanding of safety issues in the workplace related to the use of biohazards and hazardous chemicals
- emphasize the capabilities of biotechnology in society, as well as its technical and ethical limitations”

The following **curriculum** is presented:

	Course	Course Title	Cr.	Pre-req./Co-req.*	Cat.
Semester 1 Fall	ARAB1001	Arabic	3		UR
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2		UR
	LANC2058	Communication in Science	3	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604	CR
	BIOL2101	General Biology I	4	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604	DR
	CHEM 2101	General Chemistry I	4	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604 and FPMT0105 or FPMT0109	DR
	Total		16		

Semester2 Spring	BIOL 2102	General Biology II	4	BIOL2101	DR
	CHEM3322	Organic Chemistry	4	CHEM2101	DR
		College Elective	4	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604	CE
	SOCY1001	Oman Contemporary Society	1		UR
		University elective	2		UE
	Total		15		

Semester 3 Fall	CHEM 2102	General Chemistry II	4	CHEM 2101	DR
	BIOL3441	Introductory Microbiology	3	BIOL2101	DR
	BIOL3202	Molecular Biology	3	BIOL2101	DR
	BIOL3011	Plant Physiology	3	BIOL2102	DR
		University Elective	2		UE
	Total		15		

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Semester 4 Spring	BIOL3023	Animal Physiology	4	BIOL2102	DR
	BIOL4432	Genetics	3	BIOL2101	DR
		College Elective	4		CE
		College Elective	3		CE
		University Elective	2		UE
		Total	16		

Semester 5 Fall	BIOL4034	Biochemistry	3	BIOL2101+CHEM332	AR
	BIOL4046	Fundamentals of Biotechnology	3	BIOL3202	AR
	BIOL4100	Biological Data handling	3	BIOL2102	DR
		College Elective	3		CE
		College Elective	3		CE
		Total	15		

Semester 6 Spring	BIOL4030	Bacteriology	3	BIOL3441	AR
	BIOL4500	Cell Biology	3	BIOL2101	AR
	BIOL5040	Microbial Genetics and Genetic	3	BIOL3441	AR
		College Elective	3		CE
		Major Elective	3		AE
		Total	15		

Semester 7 Fall	BIOL5144	Applied Mycology	3	BIOL3441	AR
	BIOL5031	Enzyme Biochemistry	3	BIOL4034	AR
	BIOL5120	Microbial Biotechnology	3	BIOL 4046+ BIOL3441	AR
		Major Elective	3		AE
		College Elective	3		CE
		Total	15		

Semester 8 Spring		College Elective	3		CE
	BIOL5132	Tissue Culture	3	BIOL 4046+ BIOL4500	AR
	BIOL5402	Immunology	3	BIOL4500	AR
		Major Elective	3		AE
		College Elective	3		CE
		Total	15		

	CR
University Requirements (UR)	6
University Electives (UE)	6
College Requirement (CR)	3
College Electives	29
Departmental Requirements (DR)	39
Major Requirements (AR)	30
Major Electives (AE)	9
TOTAL	122

"The specific learning outcomes for the Bachelor degree programme Environmental Biology encompass the ability to:

- understand the structure-function relationships at all levels of organization of living organisms (molecules → cells → tissues → organs → systems → organisms →population → ecosystems → global biomes)
- understand biological diversity and interdependence of living organisms
- think critically the importance of biological diversity and their interaction in the ecosystem
- familiarize with flora and fauna of Omani ecosystems and recognize the urgent need for conservation of various organisms
- identify global environmental issues to enable a proper understanding of how people can live in a sustainable environment
- understand the impact of human population on the environment and describe different approaches towards more sustainable development"

The following **curriculum** is presented:

	Course	Course Title	Cr.	Pre-req./Co-req.*	Cat.
Semester 1 Fall	ARAB1001	Arabic	3		UR
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2		UR
	LANC2058	Communication in Science	3	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604	CR
		Univ. Elective-1	2		UE
	BIOL2101	General Biology I	4	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604	DR
	Total		16		

Semester 2 Spring	CHEM2101	General Chemistry I	4	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604 and	DR
	BIOL2102	General Biology II	4	BIOL2101	DR
	PHYS2101	General Physics I	4	FPEL0560 or FPEL0600 or FPEL0603 or FPEL0604 and FPMT0105 or FPMT0109	MR
		University Elective-2	2		
	Total		14		

Semester 3 Fall					
	CHEM 2102	General Chemistry II	4	CHEM 2101	DR
	BIOL 3011	Plant Physiology	3	BIOL 2102	DR
		College Elective	4		CE
	BIOL 3005	Ecology	3	BIOL 2102	AR
	Total		14		

Semester 4 Spring	BIOL 3023	Animal Physiology	4	BIOL 2102	DR
	CHEM 3322	Organic Chemistry	4	CHEM 2101	DR
	BIOL 3410	Angiosperm Biology	3	BIOL 2102	AR
	BIOL 3009	Introd. Environ. Science	3	BIOL 2102	AR
		University Elective-3	2		UE
	Total		16		

Semester 5 Fall	BIOL 3441	Introduction to Microbiology	3	BIOL 2101	DR
	BIOL 3025	Invertebrates	3	BIOL 2102	AR
	BIOL	Major Elective	3		AE
		College Elective	3		CE
		College Elective	4		CE
	Total		16		

Semester 6 Spring		College Elective	4		CE
	BIOL 4432	Genetics	3	BIOL 2101	DR
	BIOL 4501	Toxicology	3	BIOL 2101	AR
	BIOL 3202	Molecular Biology	3	BIOL 2101	DR
	BIOL	Major Elective	3		AE
	Total		16		

Semester 7 Fall	BIOL 4054	Marine Biology	3	BIOL 3005	AR
	BIOL 4021	Vertebrate Zoology	3	BIOL 2102	AR
		College Elective	4		CE
		Major Elective	3		AE
	BIOL 4100	Data Handling	3	BIOL 2102	DR
	Total		16		

Semester 8 Spring	BIOL 5021	Desert Biology	3	BIOL 3005	AR
	Boil 5052	Freshwater Biology	3	BIOL 3005	AR
		College Elective	3		CE
	BIOL	Major Elective	3		AE
			3		
	Total		15		

	CR
University Requirements (UR)	6
University Electives (UE)	6
College Requirement (CR)	3
College Electives	29
Departmental Requirements (DR)	39
Major Requirements (AR)	27
Major Electives (AE)	12
TOTAL	122