



ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes

Agricultural Engineering

Plant Science

Food Science

Provided by

Sultan Qaboos University, Muscat

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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
Agricultural Engineering	/	ASIIN	/	TC 08
Plant Science	/	ASIIN	/	TC 08, 10
Food Science	/	ASIIN	/	TC 08
<p>Date of the contract: 02.06.2019 (updated on 18.02.2020)</p> <p>Submission of the final version of the self-assessment report: 07.10.2019</p> <p>Date of the onsite visit: 03.-05.05.2021</p> <p>at: Due to continuing travel and safety restrictions caused by the Covid-19 pandemic, the audit was carried out digitally in agreement with the principal decision of the Accreditation Commission for Study Programmes.</p>				
<p>Peer panel:</p> <p>Prof. Dr. Peter Braun, Geisenheim University</p> <p>Prof. Dr. Thomas John, University of Applied Sciences Neubrandenburg</p> <p>Prof. Dr. Robert Hänsch, University of Braunschweig</p> <p>Dr. Thomas Illies, Tradecorp International S.A.U.</p> <p>Anne-Christin Kosahuba-Schrey, Student of University of Applied Sciences Niederrhein</p>				
<p>Representative of the ASIIN headquarter: Christin Habermann, M.A.</p>				

¹ ASIIN Seal for degree programmes

² TC: Technical Committee for the following subject areas: TC 08 - Agriculture, Nutritional Sciences and Landscape Architecture

Responsible decision-making committee: Accreditation Commission for Degree Programmes	
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 08 – Agronomy, Nutritional Sciences and Landscape Architecture as of 09.12.2011	

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
Agricultural Engineering	Bachelor of Engineering (B.Eng.)	/	6	Full time	/	10 Semester	136 CrH	Fall of every year 2007
Plant Science	Bachelor of Science (B.Sc.)	/	6	Full time	/	9 Semester	125 CrH	Fall of every year 1986
Food Science	Bachelor of Science (B.Sc.)	/	6	Full time	/	9 Semester	125 CrH	Fall of every year 1993

For the Bachelor's degree programme, Agricultural Engineering the institution has presented the following profile in the self-assessment report:

“At SQU, the B.Eng. in Agricultural Engineering is a 5-year 136 credits program. The program is taught by 5 faculty members with Agricultural Engineering specializations and with expertise in mechanical engineering, mechanization, tillage and farm power, instrumentation, controls and data acquisition, computer programming, precision agriculture, controlled environment agriculture, remote sensing and postharvest technology.

The Agricultural Engineering Degree is structured in a standard way: university requirements (6 credits), university electives (6 credits), college requirements (35 credits), program requirements (80 credits) and program electives (9 credits). Among the program required courses, as required by ABET, [are] two capstone courses following a project-based-

³ EQF = The European Qualifications Framework for lifelong learning

learning approach.

[The programme is] creating graduates having expertise in mechanization and farm power, design and development of machinery and equipment, ergonomics, control and instrumentation, maximizing land and water productivities, minimizing drudgery and post-harvest losses in Omani farms as an arid country where natural resources are limited.”

For the Bachelor’s degree programme Plant Science the institution has presented the following profile in the self-assessment report:

“Vision:

To be internationally and regionally recognized as a leading department in teaching, research and community service in the field of [Plant] Sciences and related disciplines.

Mission:

To develop and implement innovative [Plant] Science education and research programs to enhance production, protection, and economic value of agricultural crops and native plants. Nurture skilled graduates to serve the country by disseminating and applying their knowledge of crop production and protection for sustainable agriculture.

[...]

In accordance with the SQU and the College of Agricultural and Marine Sciences vision, the Department of Plant Sciences is committed to meeting international standards through the continuous improvement and development of its academic programs. The Department of [Plant] Sciences was established as a core unit of the College of Agricultural and Marine Sciences. The aims are to address the priority issues that create limits to the expansion of crop yields both qualitatively and quantitatively to ensure food security for the current and future generations in the country in particular and the region in common.

The Department of Crop Sciences focuses its research, education and services on production and protection of plants for human utilization and is one of the pillars of food security in Oman. The Department is concerned with the application of plant sciences to sustainable agricultural development and aims to enable its graduates to address the challenges that limit the agricultural sustained expansion in production, yield and quality that meets the nutritional needs of the current and future generations in the Sultanate.”

For the Bachelor’s degree programme Food Science the institution has presented the following profile in the self-assessment report:

The B.Sc. in Food Science Program provides strategic support to the educational objectives

of SQU and CAMS [College of Agriculture and Marine Sciences]. It is in line with the graduate attributes expected at the Bachelor's Degree level (i.e., knowledge, cognitive skills, general competencies and qualities of the holders of the Bachelor's Degree) as adopted by the university.

The objectives of the FSN undergraduate Programme are to:

- Provide students an education with comprehensive and integrated knowledge in food science and technology that will allow them to be successful in their chosen careers.
- Provide students with an understanding of the needs of the food industries from a local community level up to considering global issues and prepare them to work successfully in the wide range of governmental and non-governmental sectors.
- Produce graduates that are able to think critically and provide solutions to the problems in food or related industries and to adopt and develop new technologies and strategies
- Produce graduates that demonstrate good social skills, values, attitude, ethics and professionalism that characterize the profession of Food scientists.
- Produce graduates that feel confident to work and successfully interact and communicate in multidisciplinary teams”

C Peer Report for the ASIIN Seal⁴

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Oman National Qualification Framework
- Module Handbook for all degree programmes
- Objective-Module Matrixes for all degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The peers refer to the Subject-Specific Criteria (SSC) of the Technical Committee Agriculture, Nutritional Sciences and Landscape Architecture (TC 08) as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme Agricultural Engineering, the Bachelor's degree programme Plant Science and the Bachelor's degree programme Food Science, as defined by SQU, correspond with the competences as outlined by the SSC. They come to the following conclusion:

The qualification objectives of the Agricultural Engineering programme aim to produce graduates capable of maximizing land and water productivity, minimizing drudgery and post-harvest losses in Omani farms, adding value to farm produce, sustaining the environment and supporting the traditional Omani way of life. Graduates should have the ability to integrate their technical knowledge with skills in communication and persuasion, leading and working effectively in teams and understanding cultural diversity.

⁴ This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

Graduates of the Plant Science programme will have an understanding of plant production systems in Oman and the crop farming business. They will be able to identify and analyse problems related to plant production and solve environmental and manmade problems through design. In addition, graduates will be able to analyse and interpret data, draw conclusions and propose solutions to different issues in plant production, landscape design and plant protection.

The qualification objectives of the Food Science programme should ensure that graduates are able to understand the chemistry underlying the properties and reactions of various food components and how to control these reactions, identify the important pathogens and spoilage microorganisms in food, the conditions under which they grow, are inactivated, killed, or made harmless. In addition, graduates understand the transport processes and unit operations in food processing and they can identify the importance of food laws and regulations.

The auditors acknowledge that the objectives and intended learning outcomes of all three degree programmes under review are reasonable and well founded. Learning outcomes are viable and meet the ASIIN subject-specific requirements. The auditors point out that solid structures to regularly renew the study objectives are in place, ensured through regular evaluations and quality assurance procedures and feedback loops.

Apart from the relevant internal actors (research and teaching staff, students), external stakeholders such as industry and public authority representatives are actively engaged in the development of the programme objectives. There are sufficient structures in place, securing that objectives are regularly reflected and updated, to duly meet the sector specific and labour market demands. The peer group is convinced by the fact that ministries and industry partners regularly provide feedback on the programme objectives and contents, such as in the role as advisory board members but also through joint collaboration projects and consultations, to ensure continuous adaptation and fine-tuning of objectives, in correspondence with changing demands of the domains. Alumni surveys are regularly conducted and provide feedback also from graduates.

The peers are thus surprised to find out that unemployment rates remain significantly high for graduates. According to graduate surveys, 65% of Agricultural Engineering graduates, 53% of Plant Sciences graduates as well as 25% of Food Science graduates are still searching for a job one year after graduation. Although some of these students may have continued their education with a Master's degree, the numbers are still significant. SQU explains that Oman's economy is still mostly based on petroleum and oil and that agriculture, although increasingly important, is still a slowly-growing market. In addition, women still face discrimination on the labour market as nearly all male graduates find employment yet women

do not. SQU has responded to this by limiting the admission into these programmes for male student since employment opportunities will significantly increase for women if most of the graduates are female (cf. criterion 1.4). For the Plant Science programme, its former name “Crop Science” was a hindrance on the job market as it conveyed a false image of the study programme and the graduates’ skills. The peers are very satisfied with SQU’s response to the high unemployment rate and are certain that the measures that have already been implemented will help to increase employability for future graduates.

To sum up, the learning and qualification objectives are clearly specified and there are sophisticated structures installed in all three programmes to adequately ensure that the latest research developments as well as labour market requirements are taken into consideration in the definition of the objectives.

Criterion 1.2 Name of the degree programme

Evidence:

- Module Handbook for all degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors confirm that the names of the Bachelor’s degree programme Agricultural Engineering and Food Science correspond with the intended aims and learning outcomes as well as the main course language.

Until 2020, the Plant Science programme was named “Crop Science” and the peers inquiry the reason for this change. They learn that the Arabic translation of this title, published on the students’ transcripts, has always been “plant” so the official English title was simply aligned. In addition, “plant science” is better known as a subject in Oman, especially in the Omani industry and many job postings thus ask for graduates from a “plant science” programme.

The peers come to the conclusion that the new title of programme, Plant Science, matches the curriculum and will hopefully aid the students in their future employment.

Criterion 1.3 Curriculum

Evidence:

- Module Handbook for all degree programmes
- Study Plans for all degree programm

- Objective-Module Matrixes for all degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The curricula of all three Bachelor programmes are well designed and appropriately structured in order for students to successfully reach the intended learning and qualification objectives. The course plans are duly substantiated and are based on mandatory and elective modules which are clearly defined and specified in terms of the knowledge, skills and competencies to be acquired by the students and the particular ways of how to attain them.

The curriculum of all three degree programmes consists of several groups of modules: university requirements (UR), university electives (UE), college requirements (CR), college electives (CE), department requirements (DR), department electives (DE) as well as required and elective modules for the major (the actual degree programme) the students choose.

University requirements or electives cover general competencies for undergraduates, such as Arabic, Contemporary Omani State and People or Oman and Islamic Civilization or Islamic Culture. The college modules cover fundamental knowledge and skills such as Introduction to Agricultural and Marine Sciences, foundational skills in Mathematics, Physics and Chemistry as well as Computer Programming and Academic Writing in Science. Lastly, the programme modules focus on the subject-specific knowledge and skills the graduate needs. All these information are detailed in degree and study plans for all study programmes and easily accessible by students or other stakeholders (cf. annex to this report).

For the Agricultural Engineering programme the auditors assess it to be a very traditional programme based upon fundamental sciences. Thus, they are glad to hear that students also acquire knowledge of CAD, robotics and computer design in courses such as Design 1 and Design 2 as well as the workshop and practical parts of the curriculum. In addition, the practical parts of the curriculum have been increased over the last years so that in courses such as CAD or Design 1 and 2, students now no longer solely learn the theory but actually work on their own designs.

In general, the peers are satisfied with the amount of practical aspects of the curricula of all three study programs as nearly 50% of the modules include either work in the laboratories or in greenhouses as well as farms. The peers believe this recent increase in practical work will benefit the students to be even better prepared for their future employment. As unemployment is still an issue for some students, especially the women, (cf. criterion 1.1),

the auditors ask about mandatory internships that would bring students into contact with possible future employees early on. They learn that all three programmes contain a mandatory internship of two months where students can choose to work in a factory, organization or governmental institution. In Food Science, the mandatory internship for students includes working at three different places: a laboratory, a factory and a regulatory agency concerned with quality management. While this indubitably serves to expose the students to different career paths, the auditors are of the opinion that students of all disciplines should be given the opportunity to extend their internships up to one semester. In their opinion it takes time to truly assess a new working environment and this extended time would also allow employers to get to know the students and potentially hire them after graduation; a benefit especially for the female students who are still discriminated against in the workplace. In addition, the industry representatives state that they wished for a flexible scheduling of the internship. Currently, the mandatory internship in Agricultural Engineering, for example, takes place during the summer. As temperatures can rise up to 50°C, this limits the students' working experience as they cannot work outside, for example on the fields. The auditors thus believe it to be beneficial if SQU would discuss this matter with the industry representative during one of their upcoming meetings and possibly allow for a flexible scheduling and/or extension of the internship.

The auditors appreciate that the programmes are taught in English, which is expected to increase job opportunities and international mobility prospects for students and graduates.

In general, the auditors gain the impression that the curriculum, including the different teaching and learning methods, enable students to acquire the necessary theoretical knowledge, scientific skills and competencies in order to properly prepare them for their future employment. While the employment situation in Oman remains somewhat difficult, also due to the recent economic crisis of 2016, the auditors assert that SQU creates the best possible conditions for their students and have devised curricula that not only implements the qualification objectives and learning outcomes but also includes the feedback of the industry representatives and is subject to a regular revision and adaptation process that aids in keeping the curricula up-to-date (cf. criterion 6).

Criterion 1.4 Admission requirements

Evidence:

- Undergraduate Academic Regulations
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The admission regulations are defined in Part A of the Undergraduate Academic Regulations in line with the SQU general admission requirements and in coordination with the Oman Higher Education Admission Centre. The self-assessment reports duly specify the subject-specific entry requirements for all three Bachelor programmes.

The auditors agree that requirements and procedures are sufficiently binding, applicable to all applicants and in line with their expected learning outcomes. The programme coordinators provide relevant details about how applicants can compensate for individual admission requirements they do not yet fulfil, for instance by extending the standard period of the 1-year foundation programme to another year e.g. in order to meet the language requirements needed for successfully participating in the English-taught Bachelor programmes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:**Criterion 1.1, 1.3: Internship**

Sultan Qaboos University states that while the internship currently lasts for around 8.5 weeks, it might be possible to extend the duration to 10-12 weeks. The college values the importance of the internship program to the students learning skills and will discuss an elongation as well as a more flexible scheduling of the internship with the College's and Department's Advisory Boards.

In summary, the auditors deem this criterion as fulfilled.

2. The degree programme: structures, methods and implementation**Criterion 2.1 Structure and modules****Evidence:**

- Undergraduate Academic Regulations
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

After admission to the university, students spend typically one year, sometimes more in a Foundation Program to bring their level of English, mathematics and information technology skills to the standards required to study in English. Although students can attempt a challenge examination at the beginning of the academic year, most spend a minimum of one, more typically two and up to four semesters in the foundation program before being admitted to their “credit” programs in the different Colleges. Students who are unable to meet the minimum learning outcomes at the end of the maximum two-year foundation programs are required to withdraw from the University.

After admission into the different colleges, the academic year is divided into two 15-week semesters: spring (February-May) and fall (September-December). A shorter (seven weeks) semester is offered in the summer with a limited choice of courses for students who are in need of summer courses. The need being defined as a need for graduation, a need for prerequisite or an extreme delay towards the ideal study plan.

During the first few semesters, students generally take University and College requirement courses as well as three college electives, one of them focusing on their future choices of a major. After taking 23 credits of courses, students should choose one of the ten majors offered by the college, among them the three study programmes up for accreditation. The mechanism of assignation to a major is based on the choice of the student, the grade obtained for at least one science course as well as the cumulative Grade Point Average (for Food Science and Agricultural Engineering). It is only at this point that students leave a common core and enter fully into their respective degree programs.

The auditors assess that the three Bachelor’s programmes are in correspondence with the accreditation requirements concerning the modular structure of the programmes, comprising teaching and learning elements. The course structure in all three programmes enables that the overall subject-specific learning and qualification objectives and outcomes can be reached, particularly in the context of the elective modules and practical work experiences mandatorily gained through internships, excursion and laboratorial work (cf. criterion 1.3). Elective modules must cover between 18 to 24 credits, so between 14% to 19% in the Plant Science and Food Science programme and between 13% - 17,6% in the Agricultural Engineering programme. The peers assess the module handbook and agree that the elective modules substitute the mandatory courses in a beneficial manner. In Food Science, student also have the opportunity to choose a minor instead of choosing individual elective courses.

The peers wonder, however, why the Agricultural Engineering programme consists of 136 credits and has a duration of ten semesters while the other Bachelor's programmes consist of 125 credits and take nine semesters to complete. The programme coordinators explain that this programme is a joint undertaking by the college of Agriculture and Marine Science and the college of Engineering. Thus, the students have to take college modules from both colleges, which in turn leads to a longer study time. As a result though, students of this programme are granted the title of "engineer" and gain an additional certificate upon graduation showcasing their agricultural and engineering abilities.

Mobility

Based on the discussions during the audit, the peers gather that international mobility of the students is not yet one of SQU's main priorities and should thus be further expanded in the near future. Currently, mobility is limited to those students with the highest GPA, approximately 8-10 per college. In addition, only the mandatory internship can be taken abroad but all theoretical semesters must be attended at SQU. While students that were able to partake in the internship abroad, for example in Sri Lanka, were generally very content with the organisation and support of the university, some also mentioned difficulties with regard to the recognition. For example, one student explains that he already had agreed to a training with a company abroad but that SQU refused to recognise this training and he thus was not able to attend.

The peers thus strongly recommend to improve the opportunities for students to complete a theoretical semester or the internship abroad without any prolongation of their studies. They also urge SQU to establish a reasonable process of recognising performance conducted abroad.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

A standard workload of a regular student at SQU is 15 credit hours per semester. This corresponds thus approximately to 4 (contact hours per week) x 15 Weeks x 5 courses (15 credits/ 3 credits per course) = 300 contact hours per semester, split equally between lectures and practicals (laboratory, seminars, tutorials, etc.). Students who are academically excellent (GPA>3) can request to take 18 credits per semester if courses are available in their programs and graduating students (students in their last semester) can register, with

the approval of their academic advisor, a maximum total load of 21 credits if this extra course load allows them to graduate.

Without probation periods or delays, normal students will thus complete the degree program in 9 semesters (10 for Agricultural Engineering) following their arrival in the College (after the Foundation Program) and approximately 6 semesters after entering a major. Students can shorten this by taking additional credits during the summer semesters (Research Project, Internship, Statistics...) or taking an overload (> 15 credit-hours) during some of the regular semesters.

The overall duration (number of credits) and structure of the different degree programs (BScs) were defined by the University after consultation with the different colleges. In the College of Agricultural and Marine Sciences, all B.Sc. programs include 125 credit-hours, of which 38 are College Requirements and Electives and 12 are University Requirements and Electives. The remaining 75/76 credits are distributed among Major requirements and Major electives (see specific programs for details) and for students who wish specific contribution towards a minor. Because of the requirements of all engineering programs at SQU, the duration of the Bachelor of Engineering in Agricultural Engineering is 136 Credit-hours.

The peers learn that in the past, the majority of students were not able to finish their studies within the allotted timeframe. SQU has investigated this issue and found that not all courses were always offered, some courses did not hold enough seats for all students and some courses took place at the same time. The programme coordinators explain that SQU has reacted to these discovered issues and has set the guideline that every student must be able to take each course he/she wants to. In addition, the conflicts in term of scheduling the modules have been resolved and the schedule of the upcoming semester is announced to all students during the current semester so that any potential scheduling conflicts can be resolved quickly. The students confirm this and also state that they can always discuss these issues with their respective programme coordinators who will aid them in resolving. The peers are very satisfied with the adaptation that SQU has made in order to support graduating within the allotted timeframe. Furthermore they assess the success rates of the students which is between 95% and 98% for all study programmes and deem them to be satisfying.

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. However, it is also necessary to consider the time the students spend outside the classroom on self-studies and course preparation. For this reason, a workload based credit point system should be

devised. The workload 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 workload.

The auditors suggest introducing a workload 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' workload is converted into credits. When defining the workload of a module it should be taken into account that the total workload 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 workload 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.

The auditors also notice that not all mandatory parts of the curricula are credited. According to the degree and study plans of all three programmes, the module Introduction to Agricultural and Marine Science as well as the internship are not credited. These compulsory parts of the curricula must be credited in the future.

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 problems with regard to graduating within the regular time frame have already been addressed by SQU.

Criterion 2.3 Teaching methodology

Evidence:

- Undergraduate Academic Regulations
- Self-Assessment Report
- Discussions during the audit

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).

For the last 8 years, the University has progressively embraced outcome-based and student centred teaching and learning. This is reflected directly in the now required standardized course outlines. The strategic importance of teaching and learning pushed the University to create a Center of Excellence in Teaching and Learning to help instructors in perfecting their skills and train new faculty in various pedagogical tasks (cf. criterion 4.2).

The auditors are especially impressed with the many practice-oriented aspects of the curriculum. In Agricultural Engineering and Plant Science, most classes include an all-day field trip to a location in Oman related to the subject matter of the course. In Plant Science, for example, the Plant Propagation course may visit the Oman Botanical Garden. In addition, many classes in Plant Science include hands-on growing practice either in the greenhouses of the university or fields available on campus.

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:

- Advisor-Student Meeting Form
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the auditors the existing support structures are clearly provided, both in terms of quantity and quality. The student feedback has demonstrated that students are highly satisfied with the support provided in terms of (individual and group) mentoring, supervision and help provided in courses and research projects as well as by technicians in the laboratories. The fact that students can request additional support also from staff outside their own courses or projects is highly appreciated, e.g. by the offer to reach out to additional teachers and researchers working on their topic, especially relevant in interdisciplinary endeavours. Based on the input by the industry and public authority representatives the role of support, the peers agree that mentoring and supervision during internships and research projects is regarded as an additional important support mechanism in the process of qualifying the students. They find that during the pandemic the teaching staff has easily adapted the learning methods and channels to the new requirements and successfully developed alternative teaching forms (through Moodle courses, collaborative learning through Google Meet, learning videos, YouTube videos, lab video sessions, scheduled lab

visits in small groups etc.) so that students reach their learning objectives also under pandemic circumstances. In terms of the existing support structures the examiners conclude that all three study programmes enable students to complete their programme in the expected quality and within the scheduled time frame.

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

Criterion 2.1 Internationalization and Mobility

Sultan Qaboos University points out that the college already sends their top student (sometimes the top two) per programme overseas to undertake their internship. Some other students also travel on their own expenses. The college encourages this approach and facilitates the training with international host organizations through collaborations. SQU provides a list of students training abroad during the last five years. In 2019, for example, 30 students university-wide were trained in countries such as Malaysia, Qatar, or India. While the auditors agree that this programme is worth being continued in the future they still recommend to improve the opportunities for all students to complete a period of vocational practice or a study-semester abroad.

Criterion 2.1: Structure Ba Agricultural Engineering

SQU states that it is planned to reduce the number of credit hours for this study programme from 136 to 127 so that – like the other two programmes – the Agricultural Engineering programme can also be undertaken in nine semesters. This, however, means that three currently mandatory courses will be turned into elective modules. As this is currently only a plan, the auditors do not take this into consideration when accreditation the study programme but ask SQU to send more information on this matter once a precise decision has been made.

Criterion 2.2: Workload and Credits

The auditors have noticed a lack of credit points allocated to the college requirement course “Introduction to Agriculture and Marine Sciences”. SQU states that this course was developed with the primary aim to familiarize all college students in their first or second semester (after finishing the foundation program) about the college administrative and academic units, departments, programs, labs, and other facilities. It also teaches the students all academic regulations, induct them in the graduate attributes and learning outcomes, making them aware of their rights and duties as students throughout their study journey. Thus, since the course does not serve as a core course in the curriculum of any of the ten college programs and because of its primary goal, it was decided to not give the course any

credits. However, all college students must attend the two hours of classes per week and complete this course before majoring, typically within the first two semesters of their study. The students in this course have no assessment of evaluation. While the auditors understand that this course is not subject-specific to the individual study programs, it is nonetheless a compulsory course and as such has to be credited, notwithstanding its aims or intentions.

With regard to the internship module, SQU provides mixed information that one the one hand state that the internship is awarded 3 credit hours and that on the other hand no credit hours are awarded. Nonetheless, the study plans and module descriptions indicate that no credit hours are given. As such, the peers ask SQU for clear information on this matter.

In summary, the auditors deem this criterion mostly fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Undergraduate Academic Regulations
- Undergraduate Academic Assessment Policy
- Examination Regulation College of Agricultural and Marine Sciences
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

In 2017, SQU has adapted a unifying Undergraduate Academic Assessment Policy, aiming at providing a sound and fair assessment and grading of its students throughout the institution. Based on the achievements of learning outcomes, the policy encourages the different program managers (Dean, Head of Departments) to develop tools that ensure alignment between learning outcomes and assessments. In addition, it provides guidelines on the relative weight of the various assessments (no single component of a course evaluation should exceed 60% of the final mark) and when a final examination is chosen to be part of the course evaluation, it should exceed 40% of the final grade. A minimum of two assessment methods should be used for each course. The Policy also provides in its appendices various methods of standard-setting and grade calculation.

The examination period that concludes each of the two main semesters (Spring, Fall) lasts two weeks (10 days with one weekend) whereas the summer examination period is only one week long (as there are fewer courses offered). Because students take 4 to 6 courses per semester, they have thus 4-6 examinations typically spread over the two week examination period. The Undergraduate Academic Regulation also provides indications on the scheduling process (Centralized by the Deanship of Admission and Registration) and states that students should not have more than two examinations per day and no more than three examinations in two successive days.

Students' achievements are evaluated in each course through continuous assessment in the form of laboratory reports, field visit reports, popup quizzes, class assignments, home assignments, project reports, presentations, mid-semester exams as well as final exams. Students are informed about their exams in the first lecture of each course by the respective lecturer who provides them with a syllabus containing, among others, this information.

While the students remark that the mid-term and final exams are not too extensive, they state that the amount of additional exams throughout the semesters is too much. The peers assess the course information that contains the material to be covered each week as well as the examinations taking place. As an example, the course Introduction to Agricultural Engineering contains four assignments and four quizzes all of which count towards the final grade while the course Fundamentals of Fluid Mechanics includes ten assignments. Given that this is the norm for all courses, the auditors understand that the students are sometimes overwhelmed by the amount of exams they have to take on a weekly basis and advice SQU to limit its amount. This may also help with further reducing the number of students that cannot finish their studies on time as some students have stated that the amount of exams hinders their study progress.

The peers also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples. With regard to the final thesis, however, the auditors recommend increasing its scientificity. They agree that the theses are structured correctly and deal with modern literature, theories and methodological; yet some of them resemble semester projects more than scientific theses. This may simply be due to the limited amount of credits and thus time allocated to the final theses. The peers thus believe it to be reasonable to increase the amount of credits for the final thesis.

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

SQU states that in addition to the university's Undergraduate Academic Assessment Policy, CAMS through the Staff/Student Liaison Committee do meet with students' representatives two times per year (November and April). It takes into consideration all revealed comments. In this regard, it is worth to note that the college for example has adapted a unified policy to manage the online assessment during the Covid-19 Pandemic.

In summary, the auditors deem this criterion mostly fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- CVs of Faculty and Staff for all degree programmes
- Academic Staff Performance Report
- Contract Renewal Form
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The qualifications, scientific orientations and skills of the teaching staff are clearly identifiable the documents provided, which contributes to a successful implementing of the courses. The faculty staff members have demonstrated international track records, with longstanding experience and sound expertise and matching research outputs in the respective fields of studies, feeding well into the study programmes. There are explicit staff regulations and recommendations for faculty members to spend training and research stays abroad, which is well appreciated by the peers.

Overall, the auditors confirm that the staff has the right skill set in order to meet the teaching demands requested to ensure high quality teaching and training for the Bachelor students. During the visit they acknowledge that there is a good balance between research, teaching and administrative tasks. They do not identify major risks potentially impeding a responsible execution of the services offered to students. They are also convinced that the research conducted by the faculty duly matches the training requirements of the students,

particularly through the practice-oriented elements in the curricula and by involving students in research projects. Last but not least, the auditors are impressed by the positive and solution-focused mindedness of the faculty, and welcome the collaborative working atmosphere between staff members, evidently willing to create the best conditions to meet the learning requirements of the students.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Continuous staff development is ensured by the Center For Excellence In Teaching and Learning of SQU, offering different types of trainings to encourage targeted pedagogical practises in order to maximise students' engagement and learning outcomes. Training is also offered by the Centre for Educational Technology and the Center for Human Resources Development. Further teaching evaluations are regarded as useful mechanisms to monitor and advance the teaching skills of the staff based on a peer-to-peer approach. The visit has brought to the surface that online learning is regarded as an additional channel for the acquisition of essential online teaching skills which became indispensable during the pandemic. Annual reports focusing on teaching evaluations are quality assurance mechanisms in place, which allow individual teaching staff members to seek improvement of their skills whenever needed.

Criterion 4.3 Funds and equipment

Evidence:

- Documentation of resources and facilities
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Following the assessment of the self-assessment reports and supporting documents, videos and photos as well as the online meeting, the auditors notice that suitable and high-quality infrastructure and equipment are guaranteed for all three programmes. They acknowledge the SQU policy to share all technical resources and equipment among colleges and programmes in order to act flexibly when supporting the students' projects, even in case of limited capacities. The same counts for the laboratory places for which a transfer to other programmes' places is enabled in case of potential overbookings or lack of spaces.

A good balance between running experiments and working in laboratories in group and independent self-study is also recognised by the peers. Sound structures are in place to train the students in terms of safety regulations and instructions.

The students were equally satisfied with their laboratorial spaces, the offered equipment as well as the lecture halls, greenhouses, fields and libraries. The auditors agree that access to the SQU library, to electronic scientific and educational resources, the electronic library system, including recent publications needed for the study and research is appropriately enabled for all students.

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

In summary, the auditors deem this criterion completely fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module handbooks for all degree programs
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The module descriptions are duly differentiated and sufficiently detailed in terms of identification codes, persons in charge, teaching methods, workload, credit points, expected learning outcomes, contents, planned use/applicability, admission and examination requirements, forms of assessment as well as the recommended literature for each module. The auditors notice, however, that a module description is lacking for the final thesis module. They ask SQU to provide this module descriptions and check that all other descriptions are compiled and published.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

There is an absence of the Diploma Supplement in the documents provided, which must become a complementary element of the degree certificates, providing information on the student's qualification profile and individual performance as well as the classification of the degree programme with regard to its applicable education system. Graduates will be able to benefit from this internationally recognized, standardized document as it enables international comparability of study programmes and qualifications, and will therefore boost the recognition of the academic qualifications and degrees beyond national boundaries. For the students the Diploma Supplement is thus of added value in terms of facilitating academic and professional mobility.

Criterion 5.3 Relevant rules**Evidence:**

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors confirm that the rights and duties of both the university and the students are clearly defined and binding. Availability and free accessibility of all relevant information and regulations related to the study process, the access to the programme, the final degree, examination, quality assurance etc. will be guaranteed for all stakeholders, and is formulated in the course language English as well as in Arabic.

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

In summary, the auditors deem this criterion mostly fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development**Evidence:**

- Academic Policy Review Policy
- Examples of Evaluation Forms
- Course and Teaching Survey Summaries
- Self-Assessment Report

- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors acknowledge that there is a comprehensive quality assurance system in place at university level, at college level and department level, which is well elaborated in the Self-Assessment Reports and supporting documents as well as further specified during the online visit.

There is clear evidence provided for continuous quality assessment procedures for all three programmes. Programmes not yet accredited go through an internal programme review every five years following the evaluation by this internal Academic Program Review, which was also the case for the reviewed programmes. Courses are also duly evaluated by students based on standard Course and Teaching Survey (CTS) comprising online questionnaires with Likert-scale and open questions every semester.

During the discussion with industry and government representatives and alumni, the auditors get an impression about the manifold practices and ideas for joint collaboration (internships, joint research projects, joint consultations) and involvement of external partners in the development of the three BA programmes which is appreciated as an important element of quality assurance. The experts welcome the existing structure of Advisory Boards for the college and its departments, comprising independent experts (representatives of the industry and the government) with the mission to regularly review and provide feedback on the academic programmes, on teaching, research, outreach, consultancy, internships as well as the qualification of students and graduates and potential employability issues and to formulate ideas for potential solutions and improvements.

The auditors inquire about the reasons of the university for seeking international accreditation of its BA programme. The programme coordinators convincingly reason in terms of SQU's envisaged enhancement of the programmes' international reputation and its internationalisation processes, also in terms of offering additional chances for international student mobility.

Students and other stakeholders duly take part in the quality assurance process. The outcomes and all measures derived are made known to anyone involved. All methods employed and data analysed are regarded as suitable for the purpose of quality assurance, aiming at continuously improving the quality and of ensuring sustainability of the three programmes.

The auditors notice however that the cooperation between the two colleges involved in the Agricultural Engineering programme could be strengthened as during the discussions they were informed that there are sometimes delays in the implementation or adaptation of

new regulations or curricular content due to the fact that partners from two different colleges are involved. Thus they ask to evaluate the existing cooperation and find ways to improve it.

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

SQU states that actions have already been taken to strengthen the cooperation between the two colleges through the Steering Committee. However, any revision must be approved by the two college boards under university regulation. The auditors appreciate that SQU sees the necessity for a stronger cooperation of the two colleges and urges them to implement measures the continue bettering this joint work.

In summary, the auditors deem this criterion fulfilled.

D Additional Documents

/

E Comment of the Higher Education Institution (02.07.2021)

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

- Statistics of Overseas Internship
- Distance Teaching Regulations and Guidelines
- Workload-Structure
- Student Publications / Projects
- Module Descriptions of module “Research projects in soils, water and agricultural engineering” and module “Crop Sciences Special Problems/Research Project”)
- Publication from student’s research projects Plant Science

F Summary: Peer rec- ommen- dations (30.07.202 1)

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

Degree Programme	ASIIN Seal	Maximum du- ration of ac- creditation	Subject-spe- cific label	Maximum dura- tion of accredi- tation
Ba Agricultural Engi- neering	With require- ments for one year	30.09.2027	–	–
Ba Plant Science	With require- ments for one year	30.09.2027	–	–
Ba Food Science	With require- ments for one year	30.09.2027	–	–

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) A credit point system that is based on the amount of work the students spend on each module (workload) must be devised.
- A 2. (ASIIN 2.2) All mandatory parts of the curriculum must be credited.
- A 3. (ASIIN 3) The number of exams needs to be reduced.
- A 4. (ASIIN 5.1) Module descriptions must be available for all modules.

- A 5. (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.

Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to discuss scheduling of the internship with the industry representatives and adjust it to the seasonal conditions of the country if necessary.
- E 2. (ASIIN 2.1) It is recommended to improve the opportunities for students to complete a period of vocational practise or a stay at a different higher education institution without any prolongation of the studies
- E 3. (ASIIN 3) It is recommended to increase the scope and the amount of awarded credits for the Bachelor's Thesis.

For the Bachelor's degree programme Agricultural Engineering

- E 4. (ASIIN 6) It is recommended to intensify the cooperation between the two colleges responsible for the degree programme.

G Comment of the Technical Commit- tees

Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture (03.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the assessment of the auditors.

The Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Agricultural Engineering	With requirements for one year	30.09.2027	–	–
Ba Plant Science	With requirements for one year	30.09.2027	–	–
Ba Food Science	With requirements for one year	30.09.2027	–	–

Technical Committee 10 – Life Sciences (02.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the accreditation procedure and follows the assessment of the auditors.

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Plant Science	With requirements for one year	30.09.2027	–	–

H Decision of the Accreditation Commission (17.09.2021)

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

The Accreditation Commission discusses the procedure. They agree with the assessment of the auditors and the technical committee. However, they discuss the assessment regarding the nuclear magnetic resonance spectrometer and decide to formulate it as a recommendation instead of a requirement.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Agricultural Engineering	With requirements for one year	30.09.2027	–	–
Ba Plant Science	With requirements for one year	30.09.2027	–	–
Ba Food Science	With requirements for one year	30.09.2027	–	–

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) A credit point system that is based on the amount of work the students spend on each module (workload) must be devised.
- A 2. (ASIIN 2.2) All mandatory parts of the curriculum must be credited.
- A 3. (ASIIN 3) The number of exams needs to be reduced.
- A 4. (ASIIN 3) A Bachelor thesis must be integrated as a compulsory element of the curriculum and must become a prerequisite for graduation.
- A 5. (ASIIN 5.1) Module descriptions must be available for all modules.

- A 6. (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.

Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to discuss scheduling of the internship with the industry representatives and adjust it to the seasonal conditions of the country if necessary.
- E 2. (ASIIN 2.1) It is recommended to improve the opportunities for students to complete a period of vocational practise or a stay at a different higher education institution without any prolongation of the studies
- E 3. (ASIIN 3) It is recommended to increase the scope and the amount of awarded credits for the Bachelor's Thesis.

For the Bachelor's degree programme Agricultural Engineering

- E 4. (ASIIN 6) It is recommended to intensify the cooperation between the two colleges responsible for the degree programme.

I Fulfilment of Requirements (23.09.2022)

Analysis of the peers and the Technical Committees 08 - Agriculture, Forestry, Food Sciences and Landscape Architecture and 10 – Life Sciences (14.09.2022)

Requirements

For all degree programmes

- A 7. (ASIIN 2.2) A credit point system that is based on the amount of work the students spend on each module (workload) must be devised.

Initial Treatment	
Peers	Fulfilled Justification: There is a calculation system presented, which helps to transfer the OAAA credit points into ECTS.
TC 08	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel. However, the TC adds a recommendation: It is recommended to implement a process for determining whether the estimated workloads for self-study time are accurate.
TC 10	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 8. (ASIIN 2.2) All mandatory parts of the curriculum must be credited.

Initial Treatment	
Peers	fulfilled Justification: The course CAMS2000 is now credited. There is only one training course left in Agricultural Engineering in a joint program with the College of Engineering at SQU (accredited by ABET), without any credit point. This is absolutely acceptable.
TC 08	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 10	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 9. (ASIIN 3) The number of exams needs to be reduced.

Initial Treatment	
Peers	fulfilled Justification: The university could clarify the differences between continuous assessments and the (final) examinations. Assessments will help the students, "...to ensure that no one falls behind." Here, the university takes care that the workload is limited. For examinations, in a recent meeting with the dean and the Student-Staff liaison committee, the students reported "...that

	the issue had been resolved in all programs.” There are two exceptions, which are under the supervision by the dean and in progress to change accordingly.
TC 08	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 10	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 4. (ASIIN 3) A Bachelor thesis must be integrated as a compulsory element of the curriculum and must become a prerequisite for graduation.

Initial Treatment	
Peers	Not-completely fulfilled Justification: Up to now, there is no adequate BA-thesis implemented into the curriculum of all three programs. For Agricultural Engineering, the joined programs with the College of Engineering might be the reason – here, the university had to find a long-term solution. The project courses (PLNT4902) in Plant Science and (FSHN4902) in Food Science were shifted to a Major requirement, however, the content, the workload and the respective credits are very limited.
TC 08	Not fulfilled Vote: unanimous Justification: The TC is of the opinion that the introduced courses do not reflect the character of a bachelor thesis or a final project. Therefore, it does not view the requirement to be fulfilled.
TC 10	not for all programmes fulfilled Vote: unanimous Justification: The TC considers this requirement to be fulfilled for the Ba Plant Science and Ba Food Science study programmes, as SQU made a project course compulsory for both courses.

A 5. (ASIIN 5.1) Module descriptions must be available for all modules.

Initial Treatment	
Peers	fulfilled Justification: SQU presents the missing course description and provides course descriptions for the newly adapted research courses.
TC 08	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

TC 10	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
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A 6. (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.

Initial Treatment	
Peers	fulfilled Justification: SQU issues a Diploma Supplement for the three programmes. It complies with the ASIIN guidelines.
TC 08	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 10	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

Decision of the Accreditation Commission (23.09.2022)

The accreditation commission discusses the procedure and follows the assessment of the peers and the technical committees 08 and 10. However, it agrees with the concerns of the peers, that no equivalent to an undergraduate thesis or final project has been introduced and therefore views Requirement 4 to be not fulfilled.

The Accreditation Commission decides to award the following seals:

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Agricultural Engineering	Requirement A4 not fulfilled	/	6 months prolongation
Ba Plant Science	Requirement A4 not fulfilled	/	6 months prolongation
Ba Food Science	Requirement A4 not fulfilled	/	6 months prolongation

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's degree programme Agricultural Engineering:

Mission of the Program:

The program mission is to produce graduates capable of maximizing land and water productivity, minimizing drudgery and post-harvest losses in Omani farms, adding value to farm produce, sustaining the environment, and supporting the traditional Omani way of life.

Goals/objectives of the program

- To enable students to acquire knowledge and skills in professional development and to make them competence in methods of analysis involving use of mathematics, fundamental of physical and biological sciences, computation, and engineering sciences.
- To produce graduates with skills necessary to the design process; including abilities to think creatively, to formulate and solve engineering problems, to communicate effectively, and to synthesize information, and to use modern and appropriate computational and experimental equipment.
- To produce graduates with practical work experience and who have the ability to engage in life-long learning and continuous professional development.
- To train students to design, test and analyze agricultural, biological or environmental systems, processes and components
- To produce graduates with an ability to integrate their technical knowledge with skills in communication and persuasion, leading and working effectively in teams, and understanding cultural diversity and social and political forces that impact engineering decisions, as well as having the capability of competing in an international atmosphere.

The following **curriculum** is presented:

Study Plan: for Cohort 2018

Sem.	Course Code	Course Title	Cr.	Pre-req./Co-req.*	Cat.
ONE FALL		Foundation Program	0		UR
	TOTAL		0		

TWO SPRING	ARAB1060	Arabic	2		UR
	SOCY1005	Contemporary Omani State & People	2		UR
	CHEM2101	General Chemistry I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109)	CR
	MATH2107	Calculus I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109)	CR
	LANC2145	Communication in Agricultural Sciences	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	CAMS2000	Intro. CAMS	0		AR
	TOTAL		15		

THREE FALL	HIST1010	Oman & Islamic Civilization	2	=ISLM1010	UR
	LANC2146	Academic Writing in Science	3	LANC2145	CR
	PHYS2107	Physics for Engineering I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) and MATH2107	CR
	MATH2108	Calculus II	3	MATH2107	CR
	SWAE2001	Introduction to Agricultural Engineering	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	SWAE2307	Workshop Practice I	1	PHYS(2101 or 2107)	CR
	TOTAL		16		

FOUR SPRING	CROP2510	Introduction to Crop Production	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	AR
	MATH3171	Linear Algebra & MV Calculus	3	MATH2108	CR
	MEIE3104	Engineering Drawing & Computer Graphics	3		AR
	SWAE2201	Introduction to Soil & Water	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	AR
	SWAE2302	Fundamentals of Agricultural Machinery	3	SWAE(2001 or 2201)	AR
	TOTAL		15		

FIVE FALL	MEIE2129	Basic Mechanics	3	PHYS2107	AR
	MEIE3141	Thermodynamics I	3	CHEM2101, MATH2107, PHYS(2102 or 2108)	AR
	PHYS2108	Physics for Engineering II	4	PHYS(2101 or 2107)	CR
	SWAE3005	Land Surveying	3	MATH2107, PHYS(2101 or 2107)	AR
	SWAE3303	Elements of Hydrology	3	PHYS(2101 or 2107), SWAE(2001 or 2201)	AR
	TOTAL		16		

SIX SPRING	MATH4174	Differential Equations for Engineers	3	LANC2146, MATH2108	CR
	SWAE3306	Computer Programming	3	MATH2107, PHYS(2101 or 2107)	CR
	BIOL2101	General Biology I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	AR
	CAMS2003	Intro. to Food & Resource Economics	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	AR
	CAMS3001	Biometry & Experimental Design in AMS	3	CAMS2000, FPMT(0105 or 0109), LANC2146	AR
TOTAL			16		

SEVEN FALL	CAMS3000	Seminar & Presentation Skills	2	CAMS2000, FPMT(0105 or 0109), LANC2146	AR
	ECCE3015	Electrical Engineering Fundamentals	3	PHYS(2101 or 2107)	AR
	SWAE3201	Power Units	3	SWAE(2001 or 2302) , MEIE 2129 and MEIE3141*	AR
	SWAE3310	Fundamentals of Fluid Mechanics	3	MATH2107, PHYS(2101 or 2107)	AR
	SWAE3402	Irrigation Principles	3	SWAE2201	AR
		University Elective	2		UE
TOTAL			16		

EIGHT SPRING	FSHN3101	Properties of Food and Agr. Materials	3	PHYS(2101 or 2107)	AR
	SWAE3307	Workshop Practice II	2	SWAE2307 and MEIE 2129	AR
	SWAE3001	GIS for Environmentalists	3	LANC 2146 or 2041 or 2052 or 2058	AR
	SWAEXXXX	Major Elective	3	Check pre-requisites	AE
		University Elective	2		UE
		University Elective	2		UE
TOTAL			15		

SUMMER	SWAE4801	Agricultural Engineering Internship	0	After 95 Credits, CR*	CR
	TOTAL			0	

NINE FALL	CAMS4001	Management & Business Skills	3	CR*	AR
	FSHN3102	Elements of Food Engineering	3	PHYS(2101 or 2107) and FSHN3101	AR
	SWAE3308	Instrumentation & Control Systems	3	MATH2107, PHYS(2101 or 2107) and ECCE3015*	AR
	SWAE4300	Agricultural Engineering Design I	3	SWAE3201, MEIE3141 and After 95 Credits + CR*	AR
	SWAEXXXX	Major Elective	3	Check pre-requisites	AE
TOTAL			15		

Ten SPRING	SWAE3203	Postharvest Technology & Quality Management	3	MATH2107, PHYS(2101 or 2107), SWAE2001	AR
	SWAE4301	Agricultural Engineering Design II	3	SWAE4300	AR
	SWAE4304	Modeling & Analysis of Bio-physical Systems	3	MATH2107, PHYS(2101 or 2107) and MATH4174* + CR*	AR
	SWAEXXXX	Major Elective	3	Check pre-requisites	AE
TOTAL			12		

* for AE Major students

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Plant Science:

Graduates will

- have knowledge and skills in crop science
- have understanding of plant production systems in Oman
- have an understanding of elements of the crop farming business
- have an ability to solve environmental and manmade problems through design
- be able to identify and analyse problems related to crop production systems, and formulate realistic solutions
- have the ability to effectively communicate orally and in writing
- be able to use information technology for searching and processing data relevant to plant science and landscape design
- be able to analyse and interpret data, draw conclusion and propose solutions to different issues in crop production, landscape design and crop protection
- be able to compete with high standards of academic integrity and professionalism on the national and international scenes
- be motivated to engage in independent life-long learning
- understand and follow professional and social norms and ethics
- have the ability to build teams and work in teams for target oriented tasks
- have knowledge of relevant Omani laws, and understanding and motivation for environmental protection, resource conservation and social service

The following **curriculum** is presented:

Study Plan: for Cohort 2018 & 2019

Sem.	Course Code	Course Title	Cr.	Pre-req./Co-req.*	Cat.
ONE FALL		Foundation Program	0		UR
	TOTAL		0		
TWO SPRING	ARAB1060	Arabic	2		UR
	CAMS2000	Intro. To CAMS	0		CR
	CAMS2003	Intro. to Food and Resource Economics	3	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	BIOL2101	General Biology I	4	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109)	CR
	LANC2145	Communication in Agricultural Sciences	3	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	XXXX XXXX	University Elective*	2		UE
	TOTAL		14		
THREE FALL	HIST1010	Oman & Islamic Civilization	2	ISLM1010	UR
	CHEM2101	General Chemistry I	4	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	LANC2146	Academic Writing in Science	3	LANC(2145)	CR
	XXXX XXXX	University Elective*	2		UE
	XXXX XXXX	University Elective*	2		UE
	CROP2515	Intro. to Crop Sciences	3	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CE
	TOTAL		16		
FOUR SPRING	CAMS3000	Seminar & Presentation Skills	2	CAMS2000, FPCS(0101 or 0102), FPMT(0105 or 0109), LANC2146	CR
	CAMS3001	Biometry & Expt. Des. AMS	3	CAMS2000, FPCS(0101 or 0102), FPMT(0105 or 0109), LANC2146	CR
	PHYS2101	General Physics I	4	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109)	CR
	SWAE2201	Introduction to Soils and Water	3	FPPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CE
	CROP3333	Plant Genetics	3	BIOL2101, CROP2515	MR
	TOTAL		15		
FIVE FALL	SOCY1005	Contemporary Omani State & People	2		UR
	BIOL3011	Plant Physiology	3	LANC2145 and BIOL2101	MR
	CROP3522	Plant Pathology	3	BIOL2101	MR
	CROP3526	General Entomology	3	BIOL2101, CROP2515	MR
	CROP3211	Ornamental Horticulture	3	BIOL2101, CROP2515	MR
	CROP3512	Vegetable Production	3	BIOL2101, CROP2515	MR
	TOTAL		17		

* STUDENTS MAJORING IN CROP SCIENCES ARE NOT ALLOWED TO TAKE CROP SCIENCES UNIVERSITY ELECTIVE COURSES.

SIX SPRING	CROP3121	Bee Keeping	3	BIOL2101, CROP2515	MR
	CROP3005	Field Crop Production	3	BIOL2101, CROP2515	MR
	CROP3514	Fruit Production	3	BIOL2101, CROP2515	MR
	CROP4540	Arthropod Pests of Major Crops	3	CROP3526 + CR*	MR
	CROP4542	Diseases of Economic Crops	3	CROP3522 + CR*	MR
TOTAL			15		

SEVEN FALL	CROP3011	Plant Propagation	3	BIOL2101, CROP2515	MR
	CROP3201	Agricultural Biotechnology	3	BIOL2101	MR
	CROP4001	Crop Physiology	3	BIOL3011, CROP3211, CROP3505, CROP3512, CROP3514 +CR*	MR
	CROP4515	Landscape Design and Management	3	CROP3211+ CR*	MR
	CROP4529	Pesticides in Agriculture	3	CROP3522, CROP3526 + CR*	MR
TOTAL			15		

EIGHT SPRING	CROP4006	Weeds and their Control	3	CROP3211, CROP3205, CROP3512, CROP3514 + CR*	MR
	CROP4517	Nursery & Greenhouse Management	3	CROP3011, CROP3211, CROP3512, CROP3514, CROP4540, CROP4542 + CR*	MR
	CROP4546	Integrated Pest and Disease Management	3	CROP4540, CROP4542 + CR*	MR
	CROPXXXX	Major Elective	3	Check pre-requisites	ME
	CROPXXXX	Major Elective	3	Check pre-requisites	ME
TOTAL			15		

SUMMER	CROP4800	Crop Sciences Internship	3	Completion of a minimum of 87 credits, including: BIOL3011 CROP3011, CROP3121, CROP3201, CROP3211, CROP3333, CROP3005, CROP3512, CROP3514, CROP3522, CROP3526, CROP4001, CROP4529, CROP4540, and CROP4542 + CR*	MR
	TOTAL			3	

NINE FALL	CAMS4001	Management & Business Skills	3	CR*	CR
	CROPXXXX	Major Elective	3	Check pre-requisites	ME
	CROPXXXX	Major Elective	3	Check pre-requisites	ME
	CROPXXXX	Major Elective	3	Check pre-requisites	ME
	XXXX XXXX	College Elective	3	FP(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CE
TOTAL			15		

* CR: CAMS COLLEGE REQUIREMENT COURSES WHICH ARE BIOL2101, CAMS2000, CAMS2003, CAMS3000, CAMS3001, CHEM2101, PHYS (2101 OR 2107).

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Food Science:

The objectives of the FSN undergraduate Programme are to:

- Provide students an education with comprehensive and integrated knowledge in food science and technology that will allow them to be successful in their chosen careers.
- Provide students with an understanding of the needs of the food industries from a local community level up to considering global issues and prepare them to work successfully in the wide range of governmental and non-governmental sectors.
- Produce graduates that are able to think critically and provide solutions to the problems in food or related industries and to adopt and develop new technologies and strategies
- Produce graduates that demonstrate good social skills, values, attitude, ethics and professionalism that characterize the profession of Food scientists.
- Produce graduates that feel confident to work and successfully interact and communicate in multidisciplinary teams

Programme Learning Outcomes

Upon successful completion of this programme, students will be able to:

1. Understand the chemistry underlying the properties and reactions of various food components and how to control these reactions in particular those limiting the shelf life of foods.
2. Identify the important pathogens and spoilage microorganisms in food, the conditions under which they grow, are inactivated, killed, or made harmless in foods.
3. Understand the transport processes and unit operations in food processing required to produce a given food product and the effect of raw material variability, food processing, engineering, preservation, packaging, and storage on product safety and quality.
4. Apply analytical techniques to characterize composition and to identify physical, chemical, and biological changes in foods.
5. Identify the importance of food laws and regulations required for the manufacture and sale of safe and quality food products.
6. Conduct applied research, and use statistical tools in experimental design and data analysis.
7. Apply the principles of Food Science in its multidisciplinary scope to practical, real-world problems in Product Development.

8. Apply critical thinking and continued learning to professional problems and develop possible solutions and make thoughtful recommendations.
9. Effectively communicate scientific, technical and other information in both oral and written forms.
10. Develop organizational, teamwork, leadership skills and handling of multiple tasks and pressures.
11. Demonstrate professional skills and thoughts of ethical, social, integrity and respect for diversity.

The following **curriculum** is presented:

Study Plan: for Cohort 2019 and 2020

Sem.	Course Code	Course Title	Cr.	Pre-req./Co-req.*	Cat.
ONE FALL		Foundation Program	0		UR
	TOTAL		0		
TWO SPRING	ARAB1060	Arabic	2	ARAB1019 (for non-Arabic speakers), 3 Cr. & Offered in Fall semester	UR
	SOCY1005	Contemporary Omani State & People	2	SOCY1007 (for non Omanis)	UR
	CAMS2000	Intro. CAMS	0		CR
	CAMS2003	Intro. to Food and Resource Economics	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	CHEM2101	General Chemistry I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109)	CR
	LANC2145	Communication in Agricultural Sciences	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
		University Elective	2		UE
TOTAL		16			
THREE FALL	HIST1010	Oman & Islamic Civilization	2	=ISLM1010	UR
	BIOL2101	General Biology I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CR
	LANC2146	Academic Writing in Science	3	LANC2145	CR
		University Elective	2		UE
		University Elective	2		UE
	FSHN2101	Principles of Food Science	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CE
TOTAL		16			
FOUR SPRING	CAMS3000	Seminar & Presentation Skills	2	CAMS2000, FPCS(0101 or 0102),	CR
	CAMS3001	Biometry & Experimental Design in AMS	3	CAMS2000, FPCS(0101 or 0102), FPMT(0105 or 0109), LANC2146	CR
	PHYS2101	General Physics I	4	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109)	CR
	FSHN2301	Introduction to Human Nutrition	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CE
		College Elective	3	FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)	CE
TOTAL		15			
FIVE FALL	BIOL3441	Microbiology	3	BIOL2101	AR
	CHEM3323	Organic Chemistry for CAMS	3	CHEM2101, LANC 2146	AR
	FSHN2302	Principles of Biochemistry	3	CHEM2101, BIOL2101	AR
	FSHN3102	Element of Food Engineering	3	PHYS(2101 or 2107)	AR
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
TOTAL		15			
SIX SPRING	FSHN3101	Properties of Food & Agricultural Materials	3	(FSHN2101 or SWAE2001), PHYS2101	AR
	FSHN3106	Food Processing I	3	FSHN2101 or SWAE2001	AR
	FSHN3108	Food Packaging	3	FSHN3102 or PHYS2102	AR

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	FSHN3109	Sensory Evaluation of Food	3	CAMS3001, FSHN2101	AR
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
	TOTAL		15		

SEVEN FALL	FSHN3103	Food Analysis	3	CHEM33223, FSHN2302	AR
	FSHN3104	Food Chemistry I	3	CHEM3323, FSHN2302, FSHN2301	AR
	FSHN3105	Food Microbiology I	3	BIOL3441	AR
	FSHN3107	Food Sanitation and Quality Control	3	BIOL3441, FSHN2101	AR
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
	TOTAL		15		

EIGHT SPRING	FSHN4104	Food Chemistry II	3	FSHN3104 + CR*	AR
	FSHN4105	Food Microbiology II	3	(FSHN3105 + CR*) or BIOL4030	AR
	FSHN4120	Food Product Development	3	FSHN(2301, 3106, 3108, 3109, 3101) + CR*	AR
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
	TOTAL		15		

SUMMER	FSHN4800	Food & Nutrition Internship	3	After 87credits + FSHN(3103, 3104, 3105, 3106) + CR*	AR
	TOTAL		3		

NINE FALL	CAMS4001	Management & Business Skills	3	CR*	CR
	FSHN4106	Food Processing II	3	FSHN3106, 3101, 3102+ CR*	AR
	FSHN4107	Milk and Milk Products	3	FSHN(3104,3105, 3106) + CR*	AR
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
	FSHNXXXX	Major Elective	3	Check pre-requisites	AE
	TOTAL		15		

* CR - CAMS college requirement courses which are BIOL2101, CAMS2000, CAMS2003, CAMS3000, CAMS3001, CHEM2101, PHYS(2101 or 2107).