ASIIN Seal
Accreditation Report

Bachelor's Degree Programme
Physics

Master's Degree Programme
Physics

Provided by
Sultan Qaboos University, Oman

Version: 24th September 2024

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]
بكالوريوس العلوم في تخصص الفيزياء	Bachelor of Science in Physics	ASIIN	ASIIN, 28.09.2018 – 30.09.2024	13
ماجستير العلوم في تخصص الفيزياء	Master of Science in Physics	ASIIN	ASIIN, 28.09.2018 – 30.09.2024	13
Date of the contract: 10.04.2023 **Submission of the final version of the self-assessment report:** 05.02.2024 **Date of the audit:** 07./08.05.2024				
Expert panel: Prof. Dr. Walter Neu, University of Applied Sciences Emden-Leer/University of Oldenburg Prof. Dr. Harith Al-Azri, HoD at University of Nizwa Dr. Hartmut Presting, Mercedes Benz AG Abdul Aziz Al-Shukaili, Student at College of Engineering at the National University Oman				
Representatives of the ASIIN headquarter: Johann Jakob Winter, Dr. Natalia Vega				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of May 15, 2015				

[1] ASIIN Seal for degree programmes;

[2] TC: Technical Committee for the following subject areas: TC 13 – Physics

ASIIN General Criteria of March 28, 2023 Subject-Specific Criteria of Technical Committee 13 – Physics as of March 20, 2020	

B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor of Science in Physics	B.Sc. (Physics)	Physics with minor in other specializations	6	Full time	no	8 semesters	122 Cr	1986
Master of Science in Physics	M.Sc. (Physics)	-	7	Full time	no	4 semesters	30 Cr	1996

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

Sultan Qaboos University (SQU) is a public university in the Omani province of Al-Seeb, close to the country´s capital Muscat. Established in 1986, it is one of the two public universities in the country and is named after Qaboos bin Said Al-Said, the Sultan of Oman from 1970 until 2020. It is ranked as the top university of Oman and currently hosts about 7,500 students. As SQU is a public university, the academic education as well as teaching materials are offered free of charge, and the university additionally supports its students with different stipends like free housing and transportation.

The University has nine colleges, each managed by a dean. The two programmes under review are offered by the College of Science that, besides the department of Physics, consists also of six other departments. To underline and further develop its outstanding position in the country, many study programmes at the College of Science were or are currently subject to ASIIN accreditation. Both the Bachelor´s and Master´s programme of Physics were accredited by ASIIN in 2016 and are now subject of reaccreditation.

SQU pursues the ***Vision*** "to continue its national leading role in higher education and community service and also to be internationally recognized for innovative research, quality of its graduates, and strategic partnerships". The visions of the College of Science and the Department of Physics are aligned accordingly:

University	College	Department
Sultan Qaboos University's vision is to continue its national leading role in higher education and community service and to be internationally recognised for innovative research, quality of its graduates, and strategic partnerships.	The College of Science aspires to maintain its standing as the premier national institute and to become a renowned regional academic institution for excellence in teaching, research and community services.	The Department of Physics aspires to provide quality education to its students, maintain a high standard of scientific research and earnestly serve the community at large.

Similarly, also the ***Mission*** is formulated for all three administrative levels:

University	College	Department
To excel in teaching and learning, research and innovation, and community service by promoting the principles of scientific analysis and creative thinking in a collegial and stimulating environment and to participate in the production, development and dissemination of knowledge and interact with national and international communities.	• To provide outstanding education in science • To conduct high quality research of national and international importance • To support the scientific development of the Sultanate	• To provide an outstanding education in Physics with a diversity of skills • To advance human knowledge via good quality research • To contribute to society through professional services

The Physics Department at SQU was established in 1986 with the expertise of academic staff from Western countries. Based on that, the programme was developed extensively throughout the past years. SQU presents the following ***Profiles*** for both programmes on its website:

The Bachelor in Physics programme aims at "imparting appropriate qualifications to graduates to enable them to pursue higher-level studies in physics or take related and professional jobs. The students gain the necessary knowledge in the branches of fundamental physics like classical and quantum mechanics, thermal physics and electrodynamics and carry out the corresponding applications in the area of physics and other related fields. The students acquire the required skills in mathematical and computational techniques. Hands-on experience in experimental techniques and research is part of the program outcomes. The students are trained to work individually and within a team. The Department, in its endeavors to inculcate the life-long learning approach in students, has included in the physics core courses specifically designated components for self-learning by students."

The Master in Physics programme is "designed to produce graduates with appropriate qualifications who may pursue PhD studies in physics and related fields or the ability to perform professional jobs in research or academia. The students gain proper postgraduate knowledge in mathematical physics, classical mechanics, quantum mechanics, electrodynamics and statistical mechanics. Elective courses introduce

students to various research areas in physics and related disciplines. Through these courses, they competently acquire advanced mathematical, computational and experimental skills that help them to conduct a year-long research project. In carrying out the research project the student acquires research, communication and individual and teamwork skills."

C Expert Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Webpage SQU: https://www.squ.edu.om
- Webpage Department of Physics: https://www.squ.edu.om/science/Departments/Physics
- Discussions during the audit

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

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

The ***Programme Educational Objectives (PEO)*** of the Bachelor in Physics programme are to

- "Prepare its graduates to successfully undertake programs of graduate study in physics and related disciplines,
- Prepare its graduates to perform as professionals in a broad range of careers requiring scientific and technical knowledge, and
- Install work ethics and cultural values in its graduates".

Further, the department states a list of ***Program Learning Outcomes (PLO)*** that the students should achieve to successfully graduate:

1. “Demonstrate knowledge of the principles of physics governing microscopic and macroscopic physical processes and natural phenomena and their relation to other fields.
2. Use appropriate mathematical and computational tools to solve problems in physics.
3. Assemble and perform experiments to collect, analyse and interpret data.
4. Conduct study in research setting environment using mathematical, computer modelling or laboratory experimentation.
5. Self-learn and work independently and within a team manifesting leadership role.
6. Write and present reports, which communicate results to scientific and non-scientific audience.
7. Demonstrate integrity and honesty in their work.
8. Demonstrate awareness of national and global civic obligations”.

A qualification matrix aligns the PEOs and PLOs with the expected attributes of the graduates. These are also set in relation to the national Omani Qualification Framework (OQF) as follows:

Graduate Attributes		Oman Qualification Framework (OQF)
A. SQU graduates should be able to		
A1	Apply skills and knowledge relevant to the specialisation	Skills: Apply concepts and theories Learning to Learn
A2	Communicate effectively and use information and communication technologies	Communication, Numeracy, Information and Communication Technology skills
A3	Critically analyze complex information and present it in simple and legible manner	Communication, Numeracy, Information and Communication Technology skills
B. SQU graduates should possess		
B1	Personal skills that are aligned with the culture of international labor market to assist them in practical life and in living successfully	Employability and Values
B2	Skills and motivation to carry out independent learning and to engage in life-long learning and research	Skills: Conduct independent evaluations of information
B3	Work ethics, positive values and enjoyment of intellectual independence and autonomy	Autonomy and Responsibility
B4	Teamwork skills and the ability to display potential leadership qualities	Autonomy and Responsibility
C. SQU graduates should relish		
C	good citizenship qualities, be conscious of their national identity and be socially responsible, engage in in community affairs and be mindful of national and global contemporary issues	Employability and Values

According to the experts, graduates should understand the theoretical foundations and multiple applications of general physics and have the necessary scientific and technical knowledge and skills required to work in a laboratory and to conduct research. This includes designing and conducting experiments, as well as analysing and interpreting data. Additionally, they should understand and be able to solve problems related to their specialisation by critically and independently applying scientific thinking and methods. Moreover, students should be trained in soft skills to work both independently and as a team, communicate (verbally or in writing) their knowledge to various levels of audience, and demonstrate awareness of occupational health and safety issues as they relate to the workplace.

The experts confirm that the PEOs and PLOs of the Bachelor of Physics programme constitute a matching profile for a Bachelor´s programme. The programme offers different minors as opportunities to specialize in different fields, both in physics and interdisciplinary (e.g. medical physics, informatics, engineering). However, as the Faculty Dean admits, the Omani job market for academics is currently in a difficult state. The actual number available from the government (National Centre for Statistics and Information) is 10,000 job seekers. This includes Bachelor, Master, and Doctoral graduates. Still, they consider the Bachelor of Physics programme to be a future-oriented programme. As the discipline of physics does not target a certain industry or specific job type, the employment opportunities of graduates are manifold and flexible, which is also confirmed by alumni during the audit. On the other hand, this also results in a lack of a clear link between the programme and local industries. This became clearly visible to the experts because only three industry representatives were present at the respective audit meeting and all of them were still, at least partly, employed by the university. Nevertheless, the knowledge, ways of thinking and problem-solving approaches learned in the programme are useful also in many different job fields that are not directly related to physics-related industries, such as regulatory authorities and administrations. While graduates with the medical physics minor tend to work in hospitals, many other graduates take employment as high school teachers after completing the corresponding additional training at SQU.

The ***PEOs*** of the Master in Physics programme are to

- “Provide deeper knowledge in experimental and theoretical physics at an internationally recognized level to help students pursue careers such as teaching at tertiary level institutions and working in research and development units in government and private sectors,
- Offer hands-on research experience via advanced courses and undertake research projects that prepare students for higher studies, and

- Introduce work ethics and positive cultural values in its graduates".

The respective ***PLOs*** are defined, allocated to the respective graduate qualifications, and listed as follows:

1. "Demonstrate high-level knowledge in advanced classical mechanics, quantum mechanics, electrodynamics and statistical mechanics and apply it to complex problems in physics and in other areas.
2. Use appropriate advanced mathematical and computational tools to solve problems in physics.
3. Demonstrate the ability to successfully complete a research or design a project. This includes demonstrating skills such as assembling and conducting experiments, explaining the physical basis of the operation of an apparatus and interpretation of results of measurement or using appropriate theoretical and computing tools to model and analyse data.
4. Work independently and within a team.
5. Demonstrate writing and oral communication skills.
6. Demonstrate integrity, professionalism and honesty in their work".

According to the experts, a Master´s degree should qualify graduates for higher positions in physics-related jobs and the pursuit of an academic career. While, in Germany, the completion of both a Bachelor´s and a Master´s programme is common in the field of physics, the student numbers in SQU´s Master of Physics programme are very low. Alumni of the programme explain that, if possible, many students directly go into the industry after completing their Bachelor´s degree, if they have the chance to do so since experience is valued higher than a Master´s degree. Also, there appears to be no significant difference in the salaries of Bachelor´s and Master´s graduates, so the incentive for postgraduate studies is low, especially since the Master's programme requires the payment of tuition fees, compared to the Bachelor´s programme which is free of cost for Omani students. Students only eventually return to university after some years of job experience if they want to deepen their knowledge. The programme coordinators are aware of that and want to address the issue in the future by tailoring both programmes more directly to industry demands and hence some updates on master program's courses have to be established.

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

curriculum design and course contents of the Master´s programme, which comes short in different aspects to fulfil the established PEOs (see section **1.3** below).

The experts conclude that the objectives and intended learning outcomes of the Bachelor's and Master's degree programmes in physics adequately reflect the intended level of academic qualification (EQF 6 for the Bachelor's programme and EQF 7 for the Master's programme) and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 13 – Physics.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Reports
- Study plans
- Discussions during the audit

Preliminary assessment and analysis of the experts:
According to the Self-Assessment Report, the title obtained in the Bachelor in Physics programme varies depending on the chosen modules of a student. If a student takes a predefined set of courses from a declared minor in another science with a minimum number of 18 credits, the certificate "Bachelor of Science in Physics (with a minor in another branch of science)" (B.Sc.) is awarded. Otherwise, the title is "Bachelor of Science in Physics" (B.Sc.).

The obtained degree of the Master in Physics programme is "Master of Science in Physics" (M.Sc.). A particularity of the programme is that it does not include a higher-level specialization which is common for Physics master programmes offered by other universities in the region. Instead, the programme aims at a deeper fundamental training in both theoretical and practical physics to offer the students the opportunity to choose their specialization only for the PhD programme.

The audit team considers the Bachelor of Physics programme title appropriate for reflecting the intended aims and learning outcomes as well as the course language (English).

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions

- Webpage SQU: https://www.squ.edu.om
- Webpage Bachelor of Physics: https://www.squ.edu.om/science/Departments/Physics/BSc-in-Physics
- Webpage Master of Physics: https://www.squ.edu.om/science/Departments/Physics/Postgraduate
- Discussions during the audit

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

Structure and content

The Bachelor in Physics programme is designed as a four-year (8 semesters), full time academic programme. During this time, 122 credits hours (CR) need to be achieved by the students (equivalent to 244 ECTS points). Each semester is equivalent to 15 weeks of learning activities. Besides these learning activities, there are two week for the final exams.

The curriculum programme is divided into different modules which are described in the course outline (module handbook) and also displayed on the programme´s website. A target-module matrix clearly determines which modules contribute to which PLOs according to their contents and learning forms. Per semester, five to six courses have to be completed. Besides the subject-specific core modules in physics, mathematics and computing (e.g., Python programming), there are compulsory modules in Arabic language and history as well as science communication. 13 out of the 41 courses to be completed are electives on the university or college level. Those can be chosen also from different departments or colleges of the university and allow for interdisciplinary specialization. Additionally, a mandatory internship was integrated into the curriculum as it was recommended in the last ASIIN accreditation report. The internship with a duration of six to eight weeks is integrated in the summer break between semester six and seven and can be taken by students who have successfully accomplished at least 80 credits. The internship itself is awarded with one credit.

As a further element to combine academia and industry, SQU participates in the national initiative of the EIDAAD training programme, which was founded by different industries and the Ministry of Higher Education. This programme is implemented into the curriculum in the form of two voluntary / elective courses. Students work at companies to gain hands-on expertise, supervised by the company, and have to deliver weekly reports and a final presentation to the Department of Physics. However, as the experts learn, students who

participate in this programme do have to take a gap year and prolong their studies because of the high workload they have to deliver at the companies.

The programme allows students to include different minor degrees into their curriculum. The minor subjects currently offered in the Physics degree programme are medical physics, nuclear science, and astronomy. Each minor consists in a defined bundle of elective modules with a total of 18 credits, which have to be concluded. Students who choose other combinations of elective courses complete their degrees without a minor specialization.

The final step to graduation is a "Final Year Project", a written, thesis-like project work. The final project is divided into two courses, which have to be taken in the last two semesters, and is awarded with a total of six credits.

The experts appreciate the changes in the curriculum structure, which were introduced based on the last accreditation report:

- An internship, which is highlighted as a crucial part of the practical education was mandatorily introduced in and credited. As the experts learn, the first time a study cohort will reach the stage of the internship will be summer 2025. The introduction of the mandatory internship appears to have been a highly debated process in the Department of Physics and the College of Science, since the national and industrial demand for internships is at the moment low and the department is concerned about the difficulty of finding suitable internship opportunities for all students. A proposed solution for this issue would be the integration of students into practical research projects at the university, which the experts see as a good alternative to an internship in the industry. Nevertheless, they also highly recommend strengthening the ties between the industry and the university to allow systematic cooperation for the reduction of administrative barriers, easier processes of internship applications and supervision, as well as for networking purposes. Another option would be to open up a window of mobility for the internship such that students could complete their work experience in the industry or research institutions abroad. Lastly, in this regard, the experts question the appropriateness of only one credit point for the high workload of the internship (see also section **1.5** below).
- The weight and, respectively, the awarded credits for the Bachelor´s Thesis ("Final Year Project") were increased. The experts wonder about the naming of the "project" which, to an outsider, is highly confusing, and ask why the widespread term of "Bachelor´s Thesis" is not used. The university explains that this is due to historical reason and cannot be independently changed individually by the department. Although the experts would welcome the more concise terminology, they encounter no general problem with this issue. However, they point out that it must be made clear

in the curriculum and terminology that both courses which constitute the “Final Year Project” belong together. Regarding the quality of the project work, the experts confirm that it generally corresponds to the level of a Bachelor´s thesis.

- As requested, the module handbook was updated to now contain all the relevant information about the courses in a structured way. The experts are satisfied with the formalities of this handbook, but point out that, content-wise, some of the modules are not defined and outlined well, as e.g. in the course “PHYS 3601”. The experts raised this issue in the discussion session with the teaching staff and are satisfied with the explanations given regarding the content, structure and methodology of these courses; nevertheless, the experts recommend updating and revising the compulsory reading and textbooks. Therefore, there seems to be no problem with the courses themselves, but the module descriptions in the handbook need to be updated to reflect the actual course frameworks. This includes also a more transparent outline of which courses are basic and which courses are more specialized and require the completion of other courses beforehand. In this regard, the expert panel also advises to revise the coding of the courses to more comprehensively reflect the level and/ or semester respectively study year in which a course can or should be taken.

In terms of content, the experts are generally pleased with the programme which contains all the basic courses of a Bachelor programme in Physics, including the core disciplines classical mechanics, dynamics, optics, electronics, nuclear physics, and computational physics. In addition, there appears to be an appropriate balance between theoretical and practical teaching. Students, however, notice that the theoretical basis for experimental courses is oftentimes not sufficient. Moreover, the mathematical fundamentals do in part not meet the required level needed in the physics courses, according to the students, where some courses have some mathematical concepts that have not been covered in the studied mathematics courses. Besides that, judging the basis of the course outlines, the experts note that some more recent developments are missing in courses on currently quickly evolving physics fields, such as nuclear physics. One main reason is the provided literature, which partly does not reflect the current state of research. Although the lecturers explain how more recent developments are nevertheless covered in the courses, the experts stress the necessity of more up-to-date books and the respective outline in the module handbook.

Finally, the experts learn that the curriculum of the Bachelor programme is currently in a thorough revision process, which aims at adapting the course structure to better fit the industry demands for graduates. For this purpose a “future team” was established which has recently elaborated the plan of substituting the current system of the optional specialization through minors by a system of “streams”. This idea proposes that all students

should complete the basic physics courses together in the first years, before choosing their streams which then contain the plans for the curriculum of more advanced and specialized modules. The proposed streams, such as, e.g., medical physics and entrepreneurship, could be partly offered also by other departments or even colleges. As the medical physics minor is currently in high demand, the programme coordinators also think about creating a major for this discipline. These adaptations would give the study programme a clearer outline and, thus, make it more attractive for both students and the industry. These plans were presented to the experts during the audit discussions but are not yet officially formulated as strategy. The experts highly appreciate and encourage these efforts to constantly develop the programme, sharpen the profile, and adapt it to the current state of the presently very fast-changing market situation in Oman and the larger region.

The Master in Physics programme is a full time programme with a duration of four semesters. It encompasses 30 Omani credits (equivalent to 60 ECTS points), from which 24 have to be achieved through course work and six through the master thesis. Each course has three credits points.

The curriculum includes five compulsory core modules which cover advanced knowledge in the classical physics disciplines, as well as mechanics and electrodynamics. Three courses must be chosen from the extensive list of elective courses which serve as medium-level specialization according to the students´ interests. Instead of the electives offered at the Department of Physics, a maximum of six credits could also be obtained by choosing master-level courses from other college of science departments. The list of electives is provided in the SAR and on the programme´s website as follows:

Course code	Course name
PHYS 6011	Quantum Theory
PHYS 6012	Solid State Theory
PHYS 6013	Advanced Topics in Condensed Matter Physics
PHYS 6014	Physics of Disordered Materials
PHYS 6015	Surface Physics
PHYS 6016	Experimental Techniques in Physics
PHYS 6017	Physics of Fluids
PHYS 6018	Group Theoretical Methods in Physics
PHYS 6019	Particle Physics
PHYS 6020	Lasers and Optoelectronics
PHYS 6021	General Theory of Relativity
PHYS 6022	Liquid Crystals and Liquid Crystal Devices
PHYS 6023	Physics of Low-Dimensional Semiconductor Devices
PHYS 6024	Special Topics in Physics I
PHYS 6025	Special Topics in Physics II
PHYS 6026	Magnetism
PHYS 6027	Computational Physics
XXXXXXXXX	Maximum of two courses (6 Credits) from appropriate 4000 – 5000 level courses as specified by the Department

There is a target-module matrix which defines the PLOs to be addressed by the different courses. Lastly, the master thesis is a project work of basic and/ or applied research to be conducted in Oman. Students are assigned a thesis supervisor and a co-supervisor who guides them through the process of research which is the final requirement for the completion of the programme.

The experts find that the personnel and resource prerequisites are very beneficial for Master´s students. The labs are well-equipped also for research purposes and the thesis works are of correspondingly good quality.

However, in contrast to the Bachelor´s programme, the overall structure of the Master´s programme appears critical to the experts in multiple regards:

- First of all, the experts doubt the concept of a purely theory-oriented Master´s programme without specialization. The core focus should be more on advanced and e.g. applied physics courses rather than classical theoretical courses. Experts recommend the department to review these core courses in order to make the programme more flexible toward any update in future toward the applied physics field. The MSc core courses as well as the elective courses (tables 1.38 and 1.48 in SAR) are pure theoretical and general physics courses with no application specific con-tent. Therefore, it would enrich the elective course programme offering courses such as “renewable energies” or “energy storage and transportation” to complement the elective course list in the MSc programme. In addition this would enhance the collaboration with industry /see recommendation E.2 since it would increase the chance for the students to do a Master thesis, at least part time in industry.

- Secondly, experts are highly concerned with the course contents of the five core courses since they appear to cover a broad range of topics that belong to, respectively repeat, the contents of a Bachelor´s programme. For example PHYS4018 (Thermal & Statistical Physics) and PHYS 6004 (MSc, Statistical Physics) as well as PHYS 4030 ((Electromagnetic Theory) and PHYS 6002 (MSc, Classical Electrodynamics) . This is especially a bit confusing since students who have taken the bachelor programme course would most likely if they continue for Master have a very similar course with strong content overlap. PHYS2101 General Physics-1 and PHYS3001 Dynamics having topics are covered also in PHYS6001 Classical Mechanics. The same remark applies to PHYS6003 quantum mechanics which covers some topics found in PHYS3104 modern physics and PHYS4101 , quantum mechanics. In addition, course of PHYS6002 Classical electrodynamics which seems to be an old physics course which need a major revision or replace it with another advance applied physics course. The above mentioned courses are meant to be taught on an advanced level, but the module description lacks in detail of what the advanced content is.

  It is also confirmed by students that the share of new contents is relatively small in the Master´s courses. The programme coordinators explain that most of the students do not directly start a Master´s programme after their graduate studies, but instead only after multiple years of work in the industry. Therefore, a certain repetition of fundamentals is necessary to harmonize the level of all new entries. However, the experts insist that the share of repeated contents is far too large and that, even though students start the programme with different knowledge states, a Master´s degree requires an independent and advanced curriculum.
- The lack of recent books is particularly endangering the knowledge transfer in Master´s courses; e.g. Introduction to Statistical Mechanics by Huang (2nd edition). 1987; Introductory Quantum Mechanics (3rd Edition), Richard L. Liboff (Addison-Wesley) 1997, most of the recommended literature is also mentioned in the BA modules and outdated < 2007.
- Since the number of students in the programme is very low, the programme coordinators admit that only one of the elective courses is offered per semester. Students have to vote for their preferred course out of a choice of three courses per semester and which course is offered is based on the voting majority. The experts stress an understanding of this problem but stress that this system does not reflect the programme as it is offered and advertised to potential applicants. This method shows that elective course is compulsory course in principle where there is no other choice for student to select their needs. Thus, the number of electives should be adjusted to the number of students and the actual capacity to offer courses.

Therefore, the experts require the programme coordinators to revise the concept, structure and curriculum of the Master´s programme in order to meet the standards of an EQF level 7 degree programme.

International Mobility

The international mobility of students at SQU´s Department of Physics is generally low. Although a few student exchanges were conducted (however, mainly on the PhD level, which is not part of this accreditation procedure), a systematic organization and strategic development of international mobility for students in the course of the programmes is still at the beginning of its implementation. The currently existing system of international student exchange is organized on the university level and only a very limited number of student exchange positions is available to all students of SQU. The information provided is also not very transparent and incomplete, as the website of SQU´s student exchange programme provides only information for incoming students. As stated by students, they would appreciate opportunities for international student exchange, but the places are very limited and the chances to be admitted are low. Also, the application process is effortful and there are barriers for the recognition of achievements obtained at other institutions.

As student mobility is one of the main drivers of personal development and academic cooperation, the expert panel recommends increasing efforts to expand the student exchange programme. Besides the university-regulated programme, also the department should try to set up cooperation with other institutions on its own to enhance the mobility chances for its students, as e.g. done by the College of Economics. Important in that regard is that the information is transparently made available to the students.

The experts suggest the implementation of a mobility window during the internship as a comparatively easy but highly beneficial opportunity for all parties: As the internship is to be done during the summer break, students would not miss any courses. An internationalization of the internship would also solve the problem of limited available demand for interns by the local industry. Lastly, this would promote SQU and the quality of its students internationally and increase their later chances on the job market. Moreover, the cost of these measures is likely to be very low.

As second option for mobility would be the promotion of student exchange among universities for certain study periods. To facilitate this, the department could set up grant agreements with Physics programmes at other education institutes outside the country, which harmonize the courses to be covered, to allow students to study abroad without having to prolong their study time. Mobility programmes to be considered could be e.g. Erasmus plus or the DAAD (“German Academic Exchange Service”).

Although the mobility during the programmes is still low, the experts are positive about the number of students that study abroad for the Master´s degree after completing the Bachelor programme at SQU and, vice versa, also the number of Omani students who did their undergraduate studies abroad but came back to the country for their Master´s degree. This kind of mobility is also highly desirable and the experts suggest to further improve the opportunities for foreigners to do their Master´s at SQU, e.g. through grants and scholarships. Lastly, the programme coordinators mentioned the initiative of different universities in the entire Middle East region to boost international exchange and cooperation through the implementation of regional scientific competitions.

Curriculum Review

In both programmes, the PLOs are methodically substantiated and regularly updated within each individual course to ensure the knowledge, skills, and competencies students will acquire in each course. The Department of Physics reviews its programmes every five years as mandated by the university. This process involves different stakeholders of the university and the programmes, as elaborated in more detail in section 5. Surveys of student opinion are regularly carried out (for example, exit surveys) and the feedback from these surveys is incorporated in the revision and modification of the courses.

The experts have the impression that the Department of Physics is very eager and actively seeking feedback from different stakeholders to continuously improve their programmes. Currently, the “Future Committee” reviews and reworks the entire curriculum structure. Further remarks about the programme review can be found in section 5.

When asking the students about their assessment of feedback options, they confirm that the faculty staff is generally very open for specific feedback and suggestions for improvement, especially when feedback is delivered directly and in person. In contrast, they state that more general feedback as enquired in the regular surveys, appears to be taken seriously only to a lesser extent.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- SQU website: https://www.squ.edu.om
- Master in Physics admission website: https://www.squ.edu.om/ps/en-us/programs/articleid/788/msc-in-physics
- SQU Admission Criteria
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Admission to the Bachelor in Physics programme is based on the grades of the high school graduates in the 12th class and the performance of the students in the mandatory foundation Programme required by the university. The function of this programme, which is offered on the college basis, is to prepare high school graduates for the higher education at SQU by providing basics in three main components, which are, English language, IT skills and Basic Mathematics. In the first instance, students can choose only the college to which they want to apply, but not the specific major programme. Admission to the Bachelor programme is then based on the achievements in the foundation programme. In order to be accepted at SQU, high school graduates must pass their School Leaving Certificate with a certain grade. The College of Science requires a minimum score of 65 % in the English language and in biology, chemistry, mathematics and physics (three out of these four subjects) examinations in the Oman General Education Diploma. In 2016, the College of Science introduced uniform criteria for admission into all majors. The minimum criterion for admission into any programme includes a GPA of 2.0 and a grade of "C" in the courses selected by the department for the choice of major.

During completion of the foundation Programme, which is designed for a duration of one year, but handled flexibly according to the achievement and performance of the students, they apply for their preferred major programme at the college. Therefore, the entry numbers into Physics differ from the size of the cohorts that initially started at the college. It is also possible for students from other colleges to enter into Physics according to the Intercollege Transfer regulations. The general admission requirements are detailed in the SQU Undergraduate Academic Regulations that are published every other year and that are available via SQU's homepage. There are no tuition fees for Omani students studying at SQU (in the Bachelor's programmes).

The experts thoroughly discussed the topic of the Foundation Study Programme which needed further clarification. In general, they find a programme of that kind useful to prepare the students for their entry into their academic careers. However, this system must be made more transparent and the cohort analysis should focus only on the Physics major to allow a concise examination of graduate rates, drop-out rates, retention rates, inter-cohort comparison and an examination of the study duration of the Bachelor´s programme.

The experts also raise the question whether students generally get into the major programme. The number of students accepted in college of Science is around 160 students, but just 50 student can be accepted at physics programme. The programme coordinators explain that the capacity of the Department of Physics (50 per cohort) notably exceeds the number of students. Therefore, no students who apply for the Physics major are rejected. Vice versa, the Physics major accommodate a number of students who did not get into the

more requested programmes offered at the College of Science. The students, however, express their general satisfaction with their admission to the programme.

Lastly, the experts question the system which allows for the switch of College during the foundation Programme. The programme coordinators explain that the switching of colleges is regulated by the university and that only switches between "similar" colleges are allowed. Thus, it is e.g. not possible to get into the Physics major after completing the Preparatory Study Programme at the College of Arts.

According to the Self-Assessment Report, the number of students enrolled in the programme has been increasing since 2018 when a new admission regulation was introduced. Currently, about 150 students are actively enrolled. For instance, about 65% of graduates of the Bachelor in Physics programme during the period 2010-2015 are female. The transfer numbers from the foundation programme as well as the drop-out rates are stated in the following table:

Cocort	Enrollment to the physics major in the year after the preparatory studies						Students Registered	Dropped or transferred to other major (%)
	1st (year)	2nd (year)	3th (year)	4th (year)	Active students in Fall23)	Graduated		
2022						0		
2021	12 (2022)	26 (2023)			36	0	38	5.3
2020	11 (2021)	37 (2022)	8 (2023)		50	0	56	10.7
2019	11 (2020)	23 (2021)	3 (2022)	0 (2023)	32	0	37	13.5
2018	23 (2019)	26 (2020)	4 (2021)	0 (2022)	39	6	53	17.0

The experts express concern about the apparent high capacity of the teaching staff resulting from the low number of students, as this could be seen as a motivation to reduce staff resources. However, the teaching staff appear to be making good use of their capacity. In addition, the coordinators explain that they have no problems with justifying their personnel planning to the university administration, since the department offers many required service courses to the colleges of Engineering, Agriculture, Education and

Medicine and many courses as college and university electives. This means that the number of students in many of the offered courses is much higher than the number of students enrolled in the Bachelor in Physics programme. The experts recommend to complete the capacity matrix with all offered courses to have a better reading of capacity versus student number.

For the Master in Physics programme, the Department of Physics has specified the following admission requirements, as stated in the Self-Assessment Report and on the Admission Website of the programme:

1. Bachelor's degree in Physics or a related subject from Sultan Qaboos University or any other recognized university. The Bachelor´s degree´s Cumulative Grade Point Average (CGPA) must be of not less than 2.75 on a four-point scale or its equivalent in another system. The Deanship of Postgraduate Studies makes the assessment for equivalency acceptance. Applicants with a cumulative Bachelor's degree Grade Point Average of CGPA 2.5 and < 2.75 may be considered for admission subject to work experiences and any other academic achievements.
2. Pass an entrance examination for the MSc programme as a part of a personal interview to be conducted at the Physics Department. Depending on the performance of the applicant in exclusive interviews, the department may offer him/her a conditional admission where he/she is required to register for specified advanced undergraduate courses and pass their exams with an overall GPA of 2.75. The number of these courses, known as the Bridging Courses, is normally six and the duration for completing these is two semesters.
3. Before starting the programme, the admitted candidates should submit an English Proficiency Test Certificate Band (6) in IELTS Academic, with a minimum of 5 in each of its components or 550 in the TOEFL paper-based or 213 in TOEFL computer-based or 79 in the TOEFL through the Internet.

Applicants who do not possess a bachelor degree in physics may be provisionally admitted into the programme. However, they have to undergo a two-semester qualifying programme, referred to as a Bridging year programme, to bring them up to the required level. Students in this category are required to register for six undergraduate Physics courses and complete them with a minimum GPA of 2.75 to be allowed to continue the Master´s programme.

The students' numbers are generally low in this programme. The university identifies slightly lower admission criteria offered by other universities in the region as one possible

reason. Another reason for the lower number is that, in contrast to Bachelor´s programmes, SQU charges tuition fees for postgraduate studies of 3,000 OMR (corresponding to approximately 7,275 EUR). For international students, the fees are even higher. However, different scholarships can be granted. The statistics on Master student numbers are stated in the following table:

Cohort	Total enrolled	Omani	Inter-national	Awarded MSc		Awarded PG Diploma + withdrawn	Still active
				Male	Female		
2023	7	7				1	6
2022	7	7					5
2021	3	2	1				3
2020	5	5		1	2		1
2019	7	6	1	1	5	1	0
2018	6	6			4		0

Finding the entry requirements for the Master´s programme reasonable, the experts enquire about reasons for the low number of Master´s students. The programme coordinators and industry representatives explain that students generally prefer to start a job directly after their Bachelor graduation, if they are offered the chance. Depending on the currently difficult labour market state, the wage gap between Bachelor´s and Master´s graduates is very low and work experience valued higher. Therefore, the incentives for continuing the academic education are comparatively low and those students who are passionate about an academic career oftentimes chose to start their Master´s abroad. Partly contrasting this argumentation, many active undergraduate students express their desire to continue their career in academia also at SQU. Another reason is found in the tuition fees, which are comparatively low, but nevertheless constitute an entry barrier, especially for students from abroad. Concluding from that, the experts recommend to improve the direct permeability between the undergraduate and the Master´s programme, and make the latter also more attractive for foreigners. The programme coordinators explain to have already been considering both of these issues and future plans include a direct channel into the Master´s programme for high-performing undergraduate students, better research and industry cooperation to increase the attractiveness of a Master´s degree, and a better availability of scholarships.

In conclusion, the experts are satisfied with the admission regulations for both programmes but ask the university to make the statistical data more transparent and clear for external stakeholders, and provide clearly edited data on student intake per cohort.

Criterion 1.5 Workload and credits

Evidence:

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

Preliminary assessment and analysis of the experts:

The Bachelor in Physics programme is designed for 122 Omani credits, a regular load of 15 to 16 credits per semester. According to the Self-Assessment Report, one Omani credit is defined as one hour of lecture and two hours of self-study per semester week. Thus, a three-credit course is normally two lectures (of 50 min) plus a three-hour lab. For regular students, this adds up to 45/48 hours of study per week. The total workload in a semester, consisting of 15 weeks of lectures, is 675/720 hours for a normal student.

In the case of poor examination results and low cumulative GPAs lower than 2.00, students can be classified as "at risk" or "on probation" which results in the obligation of counselling and other corrective measures. Students can then only take a lower number of credits per semester (9-12 credits). In contrast, students with high GPAs of above 3.00 can opt to extend their workload per semester (max. 18 credits) and have the opportunity to graduate one semester ahead of time. Statistics show that about 90 % of the students are able to cope with the regular workload and can graduate in time and the drop-out rate is very low. Around 25 % of the students even manage to extend their study workload. The course workload per status is documented in the following table:

	Credit Hours Per Semester	Workload Per Week	Workload Per Semester	Workload Per Academic Year
Extended Load	18	54	810	1620
Normal Load	15/16	45/48	675/720	1350/1440
Probation Load	9/12	27/36	405/540	810/1080

For the Master in Physics programme, the workload per credit and per week is calculated differently. Each credit hour has a workload of five hours including the lecture/lab time. The normal workload is 30 Omani credits in total, nine credit hours per semester for the first two semesters and six credit hours for the last two semesters. The workload of the thesis is 30 hours per week. Hence, a workload of 45 hours per week is maintained in every semester. The normal workload in this programme appears to be reasonable, as around 90 % of all students can cope with the regular credit number per semester.

During the audit, the students confirm the experts´ impression that the workload is generally high due to the multiple assessments during the semester periods, but they are of the opinion that it is generally appropriate. Most of the students can cope with the regular workload and the assistance in case of "probation" works well. The auditors also appreciate that the credit number of the final year projects was increased, as recommended in the last accreditation report, to appropriately reflect the workload and importance of the thesis, which underlines SQU's strategy to be a leading university in research.

However, the experts raise the issue of the credit calculation which differs between the Bachelor´s and Master´s programme. Comparing the ratio between duration and credits in the Bachelor´s and Master´s programme (Bachelor: 8 semester with 122 credits, Master: 4 semester with 30 credits), there is a clear disproportion in the computation of the credits. In the discussion about this topic, it becomes clear that, although the Omani credit system is well-defined, it is actually not based on the students´ workload, as required by ASIIN criterion 1.5. The Omani credits rather reflect the importance of the course in the curriculum, which also mirrors the lecturing and study hours, but not in the workload-based sense. This becomes clear on a number of inconsistencies and indicators:

- There is no defined number of Omani credits which constitute a Bachelor´s or Master´s degree, but only a certain range. It is explained that some Bachelor´s programmes in the country are awarded with up to 135 credits while the programme under review consists only of 122 credits. The programme durations and obtained academic degrees are equivalent though, which contradicts the workload approach.
- As requested in the last ASIIN accreditation, a credit number has been assigned to the internship as a compulsory part of the study programme. However, the experts do not agree with the current state that one single credit point is awarded, since this does not correctly reflect the workload of six to eight weeks of full-time internship.
- Looking on the current distribution of credits, it appears that the workload of Master´s students is only half of the workload of Bachelor´s students per semester. The programme coordinators argue that the disproportionate ratio is due to the different calculation of credits on the academic levels. On the Master level, one credit requires higher effort and workload than on the Bachelor level. This clearly contradicts the workload-based calculation of credit points.

Because of this inconsistency, also the transformation of Omani credits into ECTS does not work appropriately. Under the assumption that full time programmes should have a workload of 30 ECTS points per semester, the Master's programme should encompass around 120 ECTS point and not only half of this. As a consequence, Master's graduates

applying at international universities for a PhD programme might be rejected, because the currently awarded ECTS points do not comply with a four semester long Master's programme. Moreover, exchange students from abroad will have difficulties with transferring their ECTS points back to their home-university.

Since the workload of the students was only estimated by the programme coordinators and seems to be too low in comparison to the actual time needed by the students, the experts suggest re-evaluating the calculation of ECTS and engaging the students in verifying the weight of each module. For this reason, it would be useful to include a respective question in the course questionnaires that are used for evaluating the quality of teaching and learning at the end of each semester. In any case, SQU must make sure that the actual workload of the students and the awarded ECTS points correspond with each other. This is especially necessary for internships and project work, when students spent a lot of their time in the lab or on self-studies.

In case the Omani system cannot be adapted accordingly, a suggestion would be to introduce a parallel system of ECTS credits which can be used as benchmark in the international perspective on the university. This system should orient on the average amount of 30 ECTS credit points to be achieved per semester. The basis for the calculation must be the total amount of students´ workload in hours of time (contact hours, lab work, self-study time, etc.; without any weighting factors per course) and must be the same for all academic levels.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

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

Preliminary assessment and analysis of the experts:

As concisely explained in the module descriptions, which were introduced since the last accreditation of the programmes done by ASIIN in 2018, there are different course types which use different learning formats and methods. The most common types are lectures, laboratory work, tutorial sessions, projects, group activities, and self-study topics. Lectures with integrated laboratory work are the predominant form of teaching, especially in the introductory courses.

Since 2018, the Physics Department started to design and implement different active learning components and corresponding assessment methods in the Bachelor in Physics programme. The core components of this active learning approach include peer instruction quizzes (PIQs), reading quizzes (RQs), and context-rich problem-solving sessions. These approaches make use of learning platforms as, e.g., Google Classroom or Moodle. In upper-level courses, also scientific report writing, and group poster preparations have been introduced into the teaching methodology. Furthermore, part of the department´s future pedagogical plan is to introduce further "self-learning" elements.

The teaching methodology is regularly evaluated by the students, as specified in more detail in section 5 of this report.

In the Master in Physics programme, the core modules rely mainly on the lecture format as the means to transmit advanced theoretical knowledge. This is then to be applied in solving projects, experiments, or case studies. On the Master level, the component of self-learning is highlighted. This includes, among others, regular homework and presentations to be held in class. Also in the course of their thesis work, students have to present their topics, approaches and results in two seminar sessions. Additionally, the thesis must be presented orally in front of a board of examiners (“thesis defence”).

In the elective part of the Master´s curriculum, the teaching methodology depends on the types and contents of the chosen modules. Some modules focus more on computational topics, while others pursue experimental or theoretical approaches. Also in the Master´s courses, active learning methods have been introduced recently.

In the discussion with the teaching staff, different lecturers explain their teaching methodology for various courses and a vivid exchange about teaching formats and the promotion of learning through different methods evolves. The experts appreciate and laud the great effort put into the development of the teaching methodology by the staff. They consider the methods and instruments to be suitable to support the students in achieving the intended learning outcomes. This includes also the training of soft skills like communication, teamwork, and leadership. In addition, they confirm that the study concepts of all programmes under review comprise a variety of modern teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centered teaching and learning).

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

In the university statement, it is remarked that “the credit system adopted by SQU is based on the American credit system, where:

a. One credit hour at the Bachelor level entails one hour of in-class lectures and two hours of student load outside class for 15 weeks, resulting in a total of three hours of workload per week.

b. One credit hour at the Masters level includes one hour of in-class lectures and four hours of out of class workload for 15 weeks, resulting in a total of five hours of workload per week. “

This means, according to the university, that the definition of workload depends on whether the credit hour is that of a master's or a bachelor's programme. They explain that they calculate the workload based on the sum of in-class and out-of-class work.

The experts appreciate this explanation. However, they believe that the total workload of students needs to be verified. In addition, students should be involved in assessing the workload of each module. SQU needs to develop a mechanism to assess the total workload of each module, e.g. by including a question to this effect in the course questionnaires used to assess the quality of teaching and learning at the end of each semester. The workload of each module must correspond to the credits awarded. In any case, SQU has to make sure that the actual workload of the students and the awarded ECTS points correspond. The ECTS system is based on the real workload and competences acquired by the students. The explanation based on the US system should at least be clarified and related to the ECTS system. In addition, the ECTS points should be implemented accordingly for better comparability with other international universities. Therefore, they stick to their assessment and to requirement **A1**.

Regarding the master's degree in physics, the university explains that according to the American system adopted by the department, the master's programme emphasizes theoretical core courses. In addition, the number of students entering the programme is small, so it is not possible to focus on specializations. This general Master's programme benefits many students who enter the Ph.D. programme, who are thus able to focus on a specific area of study. They also note that although the chapter titles in some undergraduate and graduate courses are the same, the level of treatment is more rigorous at the graduate level. For example, PHYS3104 and PHYS4101 at the undergraduate level and PHYS6003 at the graduate level do not overlap in content except for the introductory chapter of PHYS6003 (where a link is made to remind students of the basics).

The experts take this clarification into account. However, on the basis of the module descriptions provided and the feedback given by the Master's students during the visit, they could not confirm a difference in the level of treatment of the content in the Bachelor's and Master's programmes. The module descriptions need to be specified and clarified in order to make this difference clear. In any case, the experts conclude that, considering the fact that a large part of the Master's graduates are job seekers in industry and start their professional careers unemployed for some time, the currently theory oriented Master's programme would definitely benefit from an additional offer of new applied physics courses - such as "Renewable Energies", "Energy Transport and Storage", "Hydrogen Reforming from Fossil Fuels". This would also definitely strengthen the ties with industry and could lead to joint projects and externally supervised master's theses by the industrial partner. These courses could be offered in addition to the currently offered conventional physics courses and would be credited in the same way as the PHYS 602x courses. This proposal is easily feasible, considering that due to the small number of graduate students, only a few courses will be offered based on a majority vote of the students. This would give a much better job opportunity and platform to the students who definitely want to go into industry after graduation. For these reasons, the experts decide to keep the **A4** requirement.

In its statement, SQU also asks for clarification of the following assertion by the experts: “However, this system must be made more transparent and the cohort analysis should focus only on the Physics major to allow a concise examination of graduate rates, drop-out rates, retention rates, inter cohort comparison and an examination of the study duration of the Bachelor´s programme”. They explain that the self-study report focuses on the physics programme. The information contained in the report shows that students are not directly admitted to the Physics programme, but how they reach the programme since their admission to the university. The experts would like to clarify that they are referring to Table 1.5 on page 31 of the self-evaluation report. The data included in this table are not very clear for them, and, therefore, they suggest to present the cohort analysis focusing only on the major in Physics without the Foundation Programme in order to allow a concise examination of graduation rates, dropout rates, retention rates, inter-cohort comparisons and an examination of the length of study in the Bachelor's programme.

Additionally, the university remarks that the number admitted into the College of Sciences generally varies from 460 to 500 students per year. The average number of admitted students is 480. There are also 10 programmes in the College of Science and the share of each varies from 40 to 50 students to have an equitable student distribution across the college.

2. Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- SQU Undergraduate Academic Assessment Policy
- Physics Department Examination Guidelines
- SQU Academic Regulations
- Academic Handbook
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

According to the Self-Assessment Report, SQU maintains a comprehensive written policy on assessment and evaluation which states that a minimum of three assessment components must contribute to the final grade of each module. No single component is allowed to carry more than 60% of the overall grade, and in cases where a final exam is included, it must account for 40-60% of the final grade. Furthermore, the Department of Physics has installed its own affiliating guidelines which offer comprehensive details regarding the examination content, the examination administration, the moderation process, and the approval of grades. Each final examination undergoes a rigorous moderation process conducted by another faculty member who together with the instructors and the department's Examination Board determines and approves the grades. To ensure the integrity of the examination process, additional invigilators are appointed for all tests to oversee the tests.

The form of the exams for every module is specified in the associated module description (course specification). Examinations are scheduled according to SQU's academic calendar. There is a period in every semester for mid-term and final exams. Students' performance is not only evaluated based on the final examination but assignments, quizzes, laboratory work, homework, mid-term exams, and seminar work may also contribute to the final grade of a course.

The University has recently implemented an Academic Misconduct Policy which, among others, addresses the issue of exam absenteeism. It specifies the accepted reasons for missing an exam and provides regulation on how and when assessments have to be re-taken. Accepted reasons are e.g., medical, psychiatric or social reasons (e.g. death in the family), if a respective certificate is presented. The university's Academic Regulations also specify the rights and options for facilitations for disabled students or students with other special needs.

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

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

According to the regulations of SQU, all undergraduate students are required to maintain a grade point average (GPA) of at least 2.0 out of 4.0. A student failing to maintain the GPA of 2.0 will receive a warning. Since 2018, the average cumulative GPA of Bachelor in Physics graduates has always been between 2.50 (2018) and 2.81 (2023).

In the Self-Assessment Report, SQU gives extensive examples of examination forms used in different courses. An important development since the last accreditation audit was the introduction of new examination formats to improve the students' communication skills, as recommended by the 2016 peer group. These include, among others, oral examinations, group work, and student presentations with attached discussion rounds. The communication component also refers to increased oral and direct feedback by supervisors and lecturers. In addition, the written examination were developed in a more practice-oriented way by strengthening the role of, e.g., scientific reports, diaries, and project reports in the experimental courses. Moreover, the importance of the Bachelor´s thesis has been augmented by increasing the credit numbers from three to six. The grading components and criteria are displayed in the following table:

Week	Assessment	Contents	Assessors	Mode	Weight %
5	Assessment 1	• Project Objectives • Extended Literature Review • Work-plan Timeline	Team + Supervisor	Presentation & Viva (7 min. + 5 min.)	**5**
10	Assessment 2	• Introduction of the problem in the context of literature review • Methodology • New Results • Qualitative discussion of the new results • Work-plan for next 5 weeks	Team + Supervisor	Presentation & Viva (10 min. + 8 min.)	**15**
			Team	Midterm Report	**10**
15	Assessment 3	• Introduction and Objectives • Methodology • Results and Discussions (from two semesters) • Conclusions • References included within the slides	Team	Presentation & Viva (25 min. + 15 min.)	**30**
				Final Report	**25**
			Supervisor	Final Report Diary	**10** **5**

For the Master in Physics students, the assessment of the coursework is similar to the Bachelor examination forms mentioned above. However, the final thesis bears much more weight in the overall mark, accounting for six out of 30 credit points. The evaluation of the thesis is divided into two components: the written part which constitutes 80 % of the grade, and the oral defence of the thesis in front of a Thesis Examination Committee, accounting for the missing 20 %. Prerequisite for being allowed to defend the thesis is the successful completion of all 24 coursework credits with a minimum GPA of 3.00.

A non-voting senior faculty chairperson chairs the Thesis Examination Committee, all of whose members are appointed by the Dean of Postgraduate Studies (DPS). The voting members of the Thesis Examination Committee are:

1- The thesis supervisor,2- An internal examiner to be nominated by the Head of the Physics Department (HoD),
3- An external examiner (not from the Physics Department) nominated by the College of Science Postgraduate Committee.
The final grade is determined as the average of the individually given assessments of the voting members. The grading system is summarized in the following table:

Score	Grade
95-100	A
90-94.9	A-
85-89.9	B+
80-84.9	B
75-79.9	B-
70-74.9	C+
65-69.9	C
<65	F

For both programmes under review, the experts appreciate the variety of examination methods that focus learning on different aspects of the PLOs. They also gain the impression that the exams mostly reflect the used teaching methods well. Relevant rules for organizing and conducting examination, assessment criteria, procedures in case of re-sits, disability compensation measures, proceedings in case of illness and other mitigating circumstances are transparently put into legal regulations. Students and lecturers confirm in discussions that both sides are aware of the regulations, and the experts have the impression that this system is operative with the aim to meet the requirements of the students as far as possible. In discussions, students describe the organization of examinations as transparent and responsive to their needs. This judgment explicitly includes the policy of retaking the course in the case of a failure.

Highly appreciated by the experts is also the introduction of oral examination methods to train the presentation and speaking skills of students, which was recommended in the previous ASIIN accreditation report. However, as both students and teachers complain, oral examinations are partly used in courses for which this format is not adapt, such as theoretical fundamentals. The lecturers affirm that this examination method is highly work-intensive and time-consuming, both in the preparation and execution. The experts, therefore, recommend to review the courses in which oral exams are used and implement this examination form only in more advanced, content- and methodology-wise suitable courses for which the workload is manageable for the teaching staff.

In general, the experts find that the exam workload is very high, especially since there is constant exam pressure also over the entire lecturing period. This is also confirmed by the students, although they see the workload manageable. However, an aspect raised by both students and staff is that time to prepare and make all final exams is concentrated in two weeks which directly follows the lecturing period. Since the experts consider an adequate preparation time for the exams as crucial for both the learning achievement as well as also the direct success in the exams, the experts recommend to introduce a study week

between the last lecturing week and the examinations. Another approach could be spreading the final exam dates over a longer period.

As part of the on-site visit, the experts also inspect exemplary examinations as well as Bachelor's and Master's theses (“Final Projects”). Overall, they are satisfied with their quality and the given assessments.

3. Resources

Criterion 3.1 Staff and staff development

Evidence:

- Self-Assessment Reports
- Staff website of the department: https://www.squ.edu.om/science/Departments/Physics/People
- Staff Handbook
- Module descriptions
- Discussions during the audit

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

According to the SAR, the teaching loads of the academic positions are max. 3 hours for Deans, 6 for ADs/HoDs/Directors/State Council members, 9 for Deputy Directors/Deputy HoDs, and 12 for non-admin positions.

The computation of teaching hours rests on different criteria:

- Every lecture contact hour is equivalent to 1 teaching hour.
- Every lab/tutorial contact hour is equivalent to 0.5 teaching hours (if the instructor receives support from a technician in the lab) or 1 teaching hour (if the instructor receives no technical support.
- Every 1 contact hour in a training course is equivalent to 0.5 teaching hours (if the instructor receives support from staff) or 1 teaching hour (if the instructor receives no support), (limited to 3 hours per day).

- The coordinator of a training course receives 1 teaching hour while the coordinator of multisection courses receives 0.5 (if the number of sections is between 2-5 or has less than 200 students in all courses) or 1 teaching hour (if the number of sections is more than 5, giving that the number of students is more than 200)
- Supervision of PhD is equivalent to 1.5 hour/student, co-supervision of Ph.D. 0.5 hour/student, supervision of Master student 1 hour/student, final research projects of 1 student (1 hr/project) and final research projects of more than 1 student (1.5 hour/project). The supervision is limited to 3 hours.
- If a course is taught equally by 2 faculty members, then each of them will get 50 % of the teaching hours

The department has a timetable officer who is responsible for ensuring that every faculty member is assigned a fair teaching load in accordance with the scheme outlined above. The current scheme of the University mandates that each faculty member is responsible for 12 contact hours. However, there are instances where this requirement may not be strictly adhered to due to additional administrative responsibilities assigned to faculty members. Typically, the department defines a faculty's load as the teaching of six credit hours per semester, which may entail instructing two (3-credit) courses or a single course along with the supervision of labs and tutorials in other classes.

The following table, as reported by the university in the Self-Assessment Report, specifies the numbers of staff as well as their gender and nationality distribution:

Academic Staff			
Nationalities	Omani (14)	Expat (17)	Total(31)
Gender	Male (22)	Female (9)	
Rank	Professor (9)	Assoc. Prof. (9)	Assit. Prof (9)
	Lecturer (4)		
Part-time faculty	Omani (4)	Expat (0)	Total (4)
Visiting Consultants	0	2	Total(2)
Technical/support Staff			
Gender	Male (7)	Female (6)	Total (13)
Nationalities	Omani (12)	Expat (1)	Total (13)
Administrator	Oman(1)	Female	

As noted before, the experts are impressed by the apparently very comfortable staff-student ratio. However, as the lecturers report, due to the high number of students from other departments taking their courses as college requirements or university elective (e.g. engineering physics), their teaching load relative to student numbers is substantial. Nevertheless, the prescribed ratio of a maximum of 15 students per faculty member is still reached. Therefore, the department does not have to fear the cut of personnel positions, as initially suspected by the experts.

Besides the faculty staff, the experts also positively highlight the comparatively high number of eight technical staff that is responsible for the maintenance and operation of the laboratories and the assistance for students during practical lab sessions. The department rarely also employs “visiting consultants” on a short-term basis for certain modules. They are usually representatives from official authorities and the industry, most of them themselves graduates from the department. Those were also present at the meeting with industry representatives to explain how they try to give students first-hand

insights into potential future occupational fields via site visits and field trips. The experts consider this a valuable addition to the on-site teaching and suggest to further develop these teaching collaborations.

On the department´s website, there is an overview about the staff members, their vitae, careers, positions, responsibilities, and contact details. Also, vacancies are posted there. In terms of recruiting, the department employs a meticulous selection process for the appointment of academic staff which varies slightly when it comes to expatriates and Omani candidates. The process is explained in detail in the Self-Assessment Report; in both cases the important steps are the evaluation of the applicants' CVs, interviews and teaching samples. SQU assesses the candidates on various criteria like communication skills, listening, collaboration, adaptability, critical thinking, leadership, and patience. During the audit interviews, the experts learn that a comparatively high share of students aims at pursuing a further academic career and would like to work at SQU. The experts compliment the university on this reputation and learn that the department is happy to bring in more senior students and graduates as researchers. The department also actively seeks to prepare students for future teaching and research activities by contracting Master´s students as tutorial supervisors for junior students. As the programme representatives explain, this goes hand in hand with the goal to implement a postgraduate system with funding for additional research positions.

Regarding the department´s research activities, SQU has responded to a previous ASIIN recommendation by implementing various support programmes for their academic staff. Different research-sabbatical options have been created which allow the staff to do research more effectively. This has also benefited the number of international research collaborations which the department was able to set up with reputable institutions like Zernike Institute for Advanced Materials Groningen (The Netherlands), Sorbonne Université and University of Lille (France), Open University and University of Leeds University (United Kingdom), and CERN (Switzerland). Since 2018, ten faculty staff members have used the opportunity for a research leave. SQU also provides financial support for the attendance of international scientific conferences which helped increasing the number of conference participations steadily from six to 19 over the past five years.

During the on-site visit, the faculty members also explain the distribution of their workload in terms of the occupational fields teaching, administration/ supervision, and research. As part of its strategy to promote research, SQU is currently implementing a policy to adapt the workload distribution of its staff to allow for increased research activity. This is in line with the already implemented measures regarding staff leave, research semesters, international research collaborations and scientific conferences. Moreover, there are more flexible options for the staff to distribute their workload according to their preferences.

One critically mentioned point is the high administrative workload since, e.g., the department has only one secretary for all support activities. Overall, however, the staff seems highly satisfied with the distribution of their workload. These measures, which were recommended in the course of the previous ASIIN accreditation, have already become visible in the increased research output and publications in renowned journals. The experts are very satisfied with this development and encourage the university to continue this path.

In terms of staff development, SQU also encourages continuous learning of its academic and technical staff for improving their abilities and teaching methods. As described in the Self-Assessment Reports, SQU has established the Center for Excellence in Teaching and Learning (CETL), which supports the teaching staff in further developing their didactic and professional skills. To this end, it offers several workshops and training courses on various issues related to teaching and learning. Participating teachers can receive a "Certificate in Higher Education Teaching and Learning". The experts note that the entire faculty staff is very dedicated to their tasks and eager to improve their own capabilities for the delivery of successful teaching and up-to-date research. They are very impressed by the excellent and open-minded atmosphere among the students and the staff members.

Criterion 3.2 Student support

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the experts:
According to the Self-Assessment Report, SQU offers a comprehensive advisory system for all undergraduate students. Involved in support and assistance are also programme coordinators as well as all members of the teaching staff. The teaching staff offers office hours for meeting students.

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

Furthermore, every student is assigned to an academic advisor at the start of the first semester. Each academic advisor is a member of the academic staff and is a student's first addressee for advice or support on academic or personal matters. In the Department of Physics, about 20 students from each cohort are assigned to one academic advisor.

The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They advise on the choice of courses, recommend minors, and help with the scheduling of timetables. This is important especially for the students with poor GPAs who need to reduce their workload and modify their study plan. Students with problems in their academic achievement can also be referred to the Student Counselling Centre for professional help. The advisors also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers.

In the discussion, the students confirm that they all have an academic advisor, but most of the students have never contacted them. Nevertheless, they appreciate the opportunity to have a contact person in case of problems. Those students who have made use of counselling by the advisor referred to them mainly in terms of organizational and administrative questions. Content-wise problems and questions during courses are addressed with the respective course teacher in the first place; and students affirm that there is a very open-minded atmosphere and lecturers are generally responsive to constructive feedback and suggestions for improvement.

To ensure an official communication channel, the Staff-Students Liaison Committee was created as one of the standing committees in the Department. It meets once every semester to discuss matters related to teaching and learning. Furthermore, students participate in a Student Physics Group (SPG) as part of their physics-related extracurricular activities. They participate in physics demonstrations, activities, and other activities as individuals and in groups.

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

Criterion 3.3 Funds and equipment

Evidence:

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

Preliminary assessment and analysis of the experts:

SQU is a public university and almost exclusively funded by the government of Oman.

Therefore, the university is not dependent on income from tuition fees or commercial activities but has to constantly justify their budget needs to the Omani Ministry of Finance. The university funds are distributed and channelled to the colleges and departments.

According to the Self-Assessment Report, the Department of Physics receives an average annual education and teaching budget of about 20k Omani rials (47.7 EUR) and, additionally, a bi-annual budget of 30k Omani rials (71.5 EUR) for capital equipment. This mainly goes into strengthening the existing research facilities and/or procurement of new experimental setups for higher-level experimental physics courses. However, the department states that it witnessed a 45% reduction in its budget over the past six years due to more stringent spending regulations enforced by the Omani state's budgetary apparatus.

As this appears to be a significant budget cut, the experts raise this issue during the discussion with the university officials. They explain and appease the experts since this budget cut concerns only the departments own budget which goes mainly into the funding of additional research and student assistants. The funds for the personnel and running cost for the cost-intensive lab equipment are not concerned by this cut. Further, part of the cut was also a change in the university´s accounting system: While, especially for investments, the departments used to have autonomy over a certain budget for their own purposes, every investment, e.g. for lab equipment and books, must now be applied for at the university administration. Thus, the head of department ensures the experts that the budget cut does not impair the teaching activities of the department and has also no severe impact on the research opportunities.

In terms of facilities, the department has three large and seven medium-sized teaching laboratories, which are mainly used for tutorials and experimental setups. There is also a computer laboratory and 15 research laboratories equipped with more modern and advanced systems. In addition, there are advanced research-level laboratories available in the department, which are specifically designed for the Master in Physics and Ph.D. students. During the on-site visit, the experts visit the physics labs where students design and prepare physical experiments in a practical physics course. These labs are basically divided into solid state/general physics and nuclear physics. There were about 20 physical experiments in each lab, and the labs and equipment were well maintained and ready for use (there is also enough technical material to maintain the equipment and provide the necessary safety). The experts also visited an electronics and mechanics lab where students could prepare simple mechanical installations or solder cable wiring or simple circuits. It was also excellently maintained by the staff.

The experts are very impressed by the outstanding lab infrastructure of part of the department. The teaching labs are well kept and equipped with all the necessary

instruments and devices to conduct all basic and some advanced experiments in the fundamental physics fields of dynamics, mechanics, optics, and nuclear physics, especially, the Physic Experimental Instrumentation Lab. The required security provisions are in place. As the state of the lab equipment was critically mentioned in the past ASIIN accreditation report, the department has put a lot of effort into gradually renewing the devices. The research labs dispose of modern and highly advanced equipment, which is used by both the students for their final projects and the staff for their own research activities. Furthermore, the lab technicians also conduct commercial experiments for companies to generate additional revenue for the university.

Other facilities are observatories, workshops as well as a meeting room, study spaces and social areas. The department seeks to increase its internal study space for undergraduate students by reusing a foyer space in the department, which is currently reserved for doctoral candidates from other departments. In addition, SQU provides dormitories, a bookstore, a cafeteria, a hospital and several facilities for cultural, sports and other extracurricular activities to achieve a positive balance between academic and extracurricular activities.

The central library of SQU provides library services and spacious study areas for students in general. It offers online access to a wide array of prominent journals and periodicals across various disciplines through institutional memberships. Internet facilities include the provision of internet coverage and access to students, staff, and visitors via the eduroam network. Additionally, the department utilizes online platforms such as Moodle/Google Classroom for teaching and examination purposes.

The experts learn during the audit that SQU, respectively the Department of Physics, must provide all the learning materials, foremost the books, to every student free of charge. Therefore, the update of the literature catalogue, which, as explained earlier, is requested by the experts, is a financially costly mission. The programme coordinators and lecturers are already trying to adapt the programmes in such a way that open source and free access materials can be used as much as possible. As an example, the primary computation software application to be used in all computational courses used to be Matlab but was recently replaced by the open source application Python, which is becoming increasingly popular in the research community. The experts are very comprehensive of the financial burden of books and new teaching materials and appreciate the efforts put into action already. Nevertheless, they underline the necessity of up-to-date literature access for students, especially in the quickly-evolving modern Physics disciplines.

In summary, the experts find that recent investment in the laboratories have brought them up to a remarkably good level, which is perfectly suited to both learning and research activities at the Department of Physics. Other facilities for students are in good condition.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module descriptions
- Sample course outlines
- Webpage SQU: https://www.squ.edu.om
- Webpage Department of Physics: https://www.squ.edu.om/science/Departments/Physics/Course-Outline
- Discussions during the audit

Preliminary assessment and analysis of the experts:

SQU provides module descriptions for both programmes under review that follow a reasonable and comprehensive structural outline and include all necessary information about teaching methods, intended learning outcomes, content, admission and examination requirements, forms of assessment, details explaining how the final mark is calculated, and biographical references. Additionally, there are regularly updated course outlines which include more detailed information about the specific course contents, schedule, and teaching personnel. These are made available to the students via the Moodle platform.

However, the experts point out that the module descriptions are partly incomplete, inconsistent or otherwise faulty and should therefore be thoroughly revised with respect to the following aspects:

- Course coding
- Outline of modules building on each other
- Descriptions of course contents (partly outdated or unconcise)
- Update of the literature list
- Workload (see section 1.4)

Examples of courses that should be paid particular attention to are:

- Language and grammar deficits on PHYS 3601 Radiation protection: Mix of atomic and nuclear physics, radiation protection not covered, only Radon + decay products; literature from 2007
- PHYS5901 mismatch of content and literature outdated 2000
- PHYS 4901 literature from 1996 – 2001

- For all courses, except PHYS 4602, Nuclear power lit. Outdated, 2009 <->2020

There are a number of courses in the Master and Bachelor programme which according to its outlines have a strong overlap (see remarks in section 1.3 curriculum, p.19) and will be most likely attended by the same students.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

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

Preliminary assessment and analysis of the experts:
The experts confirm that both Bachelor's and Master's graduates are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Diploma Supplement contains all required information about the degree programme and follows the European template.

The Transcript of Records lists all the courses that the graduate has completed, the achieved grades, and cumulative GPA. However, the Transcript of Records should also list the awarded ECTS points for each course (if implemented correctly, see above section **1.5**).

Criterion 4.3 Relevant rules

Evidence:

- Self-Assessment Report
- All relevant regulations as published on the university's and department's webpages
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts confirm that the rights and duties of both SQU and the students are clearly defined and binding. The basic course-related information is available in the official course language English and accessible for all stakeholders via the department´s website. During the orientation week, students are made aware of their rights and responsibilities. In case of questions or problems, the academic advisors are ready to help. Moreover, they are referred to all the relevant documents, which are either available on the University website or handed as hard copies to them. For even increased transparency and availability of the information to all stakeholders, the experts recommend to make all regulations and handbooks available on the department´s website (e.g. as download links).

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

SQU notes in its statement that the level of the course given to the students indicates that the course is either introductory, intermediate or advanced. Furthermore, the bachelor level codes are assigned as follows: 2*** (introductory), 3*** (intermediate), and 4***/5*** (advanced). At the Master's level, the codes are 6*** and 7***.

In addition, the courses that should be taken as prerequisites for a particular course are specified in the course outline form, and students cannot register in a course without successfully completing its prerequisites.

This explanation is appreciated by the experts. But they recommend that it should be clearly stated in the module descriptions.

5. Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Academic Handbook
- Results of student surveys
- Discussions during the audit

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

In terms of external quality management, the department annually invited a group of internationally renowned university experts who advised on the quality standard of and improvement options for the academic programmes. The main criteria were the degree plans and courses, evaluation and examinations, as well as students' performance and standards. This practice was replaced by the successful strive towards international programme accreditation after 2016. The Physics programmes were accredited by ASIIN in 2018 and the current procedure aims at reaccreditation.

On the other hand, internal evaluation of the quality of the degree programmes is provided through the Curriculum Committee (which reports to the Physics Departmental Board) and

through student participation. Every five years, there is an internal review for all degree programmes based on 29 criteria by the Programme Committee. Students´ feedback is taken into account for the development of the programmes. Students can provide feedback through their representatives on the Student Liaison Committee, through course questionnaires (an on-line survey done at the end of each course), an exit survey, and via direct communication with the teaching staff and the Head of Department.

The experts verify the feedback mechanism in the discussion session with the students, who confirm that surveys are regularly conducted. However, most of the students are of the opinion that their comments and recommendations are not taken seriously. A problem in this regard is that the results cannot be discussed in class, because the lecturers obtain the results of the surveys only after the end of the semester. Therefore, the experts recommend changing the survey system and collecting the feedback already earlier in the semester to ensure the timely evaluation and discussion with the students. This closure of the feedback loop is crucial to the improvement of internal quality assurance. On the other hand, the students positively highlight the responsiveness of lecturers when approaching them directly with questions and critiques.

A shortcoming in the collection of feedback from stakeholders is the weak connection to alumni and industrial stakeholders. Regarding alumni, the university representatives explain that the Alumni Office recently started an initiative to contact all SQU graduates with the goal of establishing an alumni network. The first phase of this mission has been executed by contacting the alumni and asking for their permission for further communication in that regard, which has been widely positively responded. Further steps are yet to be planned, but the experts welcome and encourage this initiative. By means of the alumni, also the industry ties could be strengthened to create channels for continuous and systematic cooperation. The experts stress the linkage between the university and the industry as one of the important issues to be tackled in the upcoming months since many aspects of the programmes´ quality depend on that.

Besides quality assurance measures prescribed by the university, the Department of Physics actively seeks to individually enhance their programmes´ quality. The already mentioned “Future Committee” is one example of the great commitment and dedication the experts note with respect to the further development of the department. As this committee is concerned mostly with the Bachelor in Physics programme until now, the experts recommend to expand the committee’s horizon to the Master in Physics programme as well, since there they find the most potential and necessity for improvement.

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

D Additional Documents

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

D 1. Student intake numbers

D 2. Graduation rate and retention rate statistics

E Comment of the Higher Education Institution (02.08.2024)

The institution provided the following additional statistics:

D 1. Student intake numbers

D 2. Graduation rate and retention rate statistics

The Department kept data on students from 2018 cohort onwards. The following table shows the admitted students, the students currently in progress, the students who dropped out of the programme and the students who graduated by the end of 2023.

Bachelor's Programme

Cohort	Admitted	Progressing	Attrition	Graduated
2021	53	49	4 (7.5%)	
2020	57	48	9 (15.8%)	
2019	37	30	7(18.9%)	
2018	53	24	9(17%)	20 (37.7%)

The majority of the remaining 2018 cohort have already completed the graduation requirements and will be awarded their bachelor's degrees this year. Some of the 2019 cohort have completed their graduation requirements and will be awarded their degrees this year.

Master's Programme

Cohort	Admitted	Progressing	Attrition***	Graduated
2022	5**	4	0 (0.0%)	1
2021	3	2*	0 (0.0%)	1
2020	5	0	1 (20.0%)	4 (80.0%)
2019	7	0	1 (14.2%)	6 (85.8%)
2018	6	0	2 (33.3%)	4 (66.6%)

Please note that some students spend one (Bridging) year studying the required essential prerequisite courses before joining the two-year Master's Programme.

*The two students from 2021 cohort who are in progress have postponed their studies by one semester. They will be graduating soon.
** Note that two students were admitted as Bridging year students. They started their Master Programme with the 2023 cohort.
***The attrition is attributed mainly to academic reasons.

The following quotes the comment of the institution:

"In the following, we report our general observations on the experts' report. Our observation do not invalidate the contents of the report, but rather clarify some statements.

We would like initially to clarify two points.

1. **The Credit system**: The credit system adopted by SQU is based on the American credit system, where:
   a. **One** credit hour at the Bachelor level entails one hour of in-class lectures and two hours of student load outside class for 15 weeks, resulting in a total of three hours of workload per week.
   b. **One** credit hour at the Masters level includes one hour of in-class lectures and four hours of out of class workload for 15 weeks, resulting in a total of five hours of workload per week.

   These credit hours are explained in the Self-study report and are included in the course outline forms submitted as part of the report.

2. **The Master's Programme Curriculum**: For the Master's Programme, the department also adopts the American universities' approach, where the core curriculum covers advanced fundamental physics rather than focusing on specialized areas. A sample of some American university's curricula is attached for reference.

Comments and Observations

1. On page 11, the second paragraph it is quoted that "… more than 100,000 (Omani) university graduates being unemployed." The actual number available from the government (National Centre for Statistics and Information) is 10,000. This includes Bachelor, Master, and Doctoral graduates.

2. Please note that the official language our government and its various institutions (SQU being one of them) use is “job seekers” as opposed to “unemployed”. It would be better to replace “unemployed” throughout your report with “job seekers”.

3. On page 13, at the end of the first paragraph under *structure and contents*, replace “..There is one week..” by “..There are two weeks..”. This again arises on page 33 of your report, in the last paragraph.

4. On page 16, in the third bullet of the comments:
   “*Therefore, there seems to be no problem with the courses themselves, but the module descriptions in the handbook need to be updated to reflect the actual course frameworks. This includes also a more transparent outline of which courses are basic and which courses are more specialized and require the completion of other courses beforehand. In this regard, the expert panel also advises to revise the coding of the courses to more comprehensively reflect the level and/ or semester respectively study year in which a course can or should be taken*.”

   We would like to bring to your attention the following:
   a. The level of the course handed out to students states the course is either introductory, intermediate or advanced.
   b. The codes at the Bachelor level are assigned as follows: 2*** (Introductory), 3*** (Intermediate) and 4***/5*** (Advanced). The codes 6*** and 7*** are used at the Master level.
   c. The courses that should be taken as prerequisites of a particular course are specified in the course outline form and students cannot register in a course without successfully completing its prerequisites.

5. On page 16, in the paragraph after the last bullet:
   “*Moreover, the mathematical fundamentals do in part not meet the required level needed in the physics courses where some courses have some mathematical concepts that have not been covered in the studied mathematics courses*.”

   This sentence is not fully accurate. The appropriate math courses that our department requires as prerequisites cover more math than what is required for our physics courses. Furthermore, the department introduced an additional “theoretical methods of physics” course to overemphasize math skills and address any inadequacies.

6. On page 18 in the comments that follow the sentence "*However, in contrast to the Bachelor´s programme, the overall structure of the Master´s programme appears critical to the experts in multiple regards*:"

   The following two comments in the report need to be reconsidered or rephrased considering the following:

   a. The first comment is in contrast with the philosophy of the Master's Programme as adopted by the department. As stated above, we adopt the American system for our Master's programme, which emphasizes theoretical core courses. In addition, as stated, there are few students who join the programme and hence it is not possible to focus on specializations. This general Master's programme benefits many students who join the doctoral programme, who consequently can focus on specific area of study.
   b. Indeed the titles of chapters in some Bachelor's and Master's courses are the same; however, the level of treatment is more rigorous at the Master's level. In reference to PHYS3104 and PHYS4101 at the Bachelor's level and PHYS6003 at the Master's level, there is no overlap of the contents except for the introductory chapter of PHYS6003 (where a link to remind the students of the basics is made) and the level of treatment is different.

7. On page 22, first, second, and third paragraphs:
   a. We would like to clarify that students cannot apply to majoring in programmes after completion of the foundation programme. They must take courses from the College of Science before applying for a major. Please see page 28 of our self-study report.
   b. We are not sure of what is meant by the statement "*However, this system must be made more transparent and the cohort analysis should focus only on the Physics major to allow a concise examination of graduate rates, drop-out rates, retention rates, inter cohort comparison and an examination of the study duration of the Bachelor´s programme*". The self-study report focusses on the physics programme. All data is related to the physics programme. The information included in the report shows that students are not directly admitted into the physics programme, but shows how they reach the programme since their admission into the university.
   c. In the sentences "*The experts also raise the question whether students generally get into the major programme. The number of students accepted in college of Science is around 160 students. but just 50 students can be accepted at physics programme*." This has to be corrected due to the following. The number admitted into our college generally varies from 460 to 500 students per year. The average number of admitted students is 480. There are also 10 programmes in the College of Science and the share of each varies from 40 to 50 students to have an equitable student distribution across our college.

8. On top of page 23, in the sentence "*About one-third of students and graduates of the Bachelor's in Physics programme are female*." The correct fraction is two-thirds and not one-third.

9. On page 23, in the sentence "*In addition, the coordinators explain that they have no problems with justifying their personnel planning to the university administration since the department offers many courses as college and university electives, which are not included in the above given table."* The phrase "*offers many courses as college and university electives",* should be modified to "*offers many required service courses to the colleges of Engineering*, *Agriculture, Education and Medicine and many courses as college and university electives".*

10. On page 23, in the sentence "*The experts recommend to complete the capacity matrix with all offered courses to have a better reading of capacity versus student number*": We show in page 12 of the self-study report the workload of the department from all course categories expressed in terms of Full Time Equivalent (FTE).

11. On page 27, the last bullet "*Looking on the current distribution of credits, it appears that the workload of Master´s students is only half of the workload of Bachelor´s students per semester. The programme coordinators argue that the disproportionate ratio is due to the different calculation of credits on the academic levels. On the Master level, one credit requires higher effort and workload than on the Bachelor level. This clearly contradicts the workload-based calculation of credit points.*" As pointed out earlier, definition of workload depends on whether the credit-hour is that of a Master's programme or a Bachelor's programme. We calculate the workload based on the total of in-class and out-of-class load.

12. On page 27, following the last bullet, the comparison between ECTS and Credit-point system made on one-to-one basis, is not accurate. The accepted comparison is 1 credit-point = 2 ECTS. Please see the link: https://en.wikipedia.org/wiki/European_Credit_Transfer_and_Accumulation_System

    We hope this would solve of doubts drawn based on the one-to-one comparison.

13. On page 36, in the paragraph after the table, please replace the phrase "…*other departments taking their courses as college or university elective…*" by "…*other departments taking their courses as college requirements or university elective..*"

14. On page 42, the two items, Course coding and Outline of modules building on each other, are already implemented as pointed in item 4 above"

F Summary: Expert recommendations (16.08.2024)

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2031	–	–
Ma Physics	With requirements for one year	30.09.2031	–	–

Requirements

For all degree programmes

A 1. (ASIIN 1.5, 4.2) Verify the students' total workload and implement the ECTS points accordingly for a better comparability with other international universities. The ECTS point system can be used parallel to the Omani credit point system and be included in the Transcript of Records.

A 2. (ASIIN 4.1) The module descriptions for the Master's thesis need to include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies).

A 3. (ASIIN 5) Make sure that all students receive information on the results of the course questionnaires (teaching evaluations) and that the surveys are conducted anonymously.

For the Master's degree programme

A 4. (ASIIN 1.3) Review the structure, curriculum and course contents of the programme to reduce overlaps with the Bachelor´s programme and raise the standard to a Master´s level.

Recommendations

For all degree programmes

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

E 2. (ASIIN 1.3) It is recommended to strengthen the department’s ties with the industry.

E 3. (ASIIN 2) It is recommended to introduce a study week between the last lecturing week and the examinations or to spread the final exam dates over a longer period.

E 4. (ASIIN 3.3) It is recommended that the university provide more support for access licences for articles and e-books.

E 5. (ASIIN 4.1) It is recommended to review and update the module descriptions with respect to contents and literature.

E 6. (ASIIN 4.3) It is recommended to publish all the relevant rules and regulations as well as module handbooks on the department´s website to increase transparency and completeness of the available information to the stakeholders.

G Comment of the Technical Committee 13- [Physics] (13.08.2024)

Technical Committee 13 – Physics

Assessment and analysis for the award of the ASIIN seal:

The TC discusses the procedures, in particular A3. The members wonder whether the requirement is related to the content or the level of the Master's programme. Mr Neu explains that the module descriptions of the Master's programme are meant, as these cannot be distinguished from the course descriptions of the Bachelor's programme. Therefore, the TC decides to change the wording in order to clarify the meaning of this requirement. In addition, in relation to A1, the TC discuss the need for a standard wording concerning the requirement relating to workload and the conversion of national credit systems into ECTS points, taking into account ASIIN Criteria 1.5 and 4.2. They also consider that these criteria do not seem to require compulsory implementation of ECTS for non-European higher education institutions. Therefore, this issue should be clarified and, if necessary, the wording of the criterion should be reviewed by ASIIN. The standard wording, if available, should also be used in A2. The TC also correct A4, as it referred to the Master's programme and not the Master's thesis.

The Technical Committee 13 – Physics recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2031
Ma Physics	With requirements for one year	30.09.2031

Requirements

For all degree programmes

A 1. (ASIIN 1.5, 4.2) Verify the students' total workload and adjust the awarded ECTS points accordingly for a better comparability with other international universities.

Include the number of ECTS credits in the Transcript of Records and provide information on the credit conversion in the Diploma Supplement.

A 2. (ASIIN 5) Close the feedback cycles and inform the students directly about the results of the course questionnaires.

For the Master's degree programme

A 3. (ASIIN 1.3) Review the description of structure, curriculum and learning outcomes of the programme in the module handbook and make it consistent with the Master´s level.

A 4. (ASIIN 4.1) The module descriptions for the Master's programme need to include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies).

Recommendations

For all degree programmes

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

E 2. (ASIIN 1.3) It is recommended to strengthen the department's ties with the industry.

E 3. (ASIIN 2) It is recommended to introduce a study week between the last lecturing week and the examinations or to spread the final exam dates over a longer period.

E 4. (ASIIN 3.3) It is recommended that the university provide more support for access licences for articles and e-books.

E 5. (ASIIN 4.1) It is recommended to review and update the module descriptions with respect to contents and literature.

E 6. (ASIIN 4.3) It is recommended to publish all the relevant rules and regulations as well as module handbooks on the department´s website to increase transparency and completeness of the available information to the stakeholders.

H Decision of the Accreditation Commission (24.09.2024)

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

The Accreditation Commission discuss the procedure, particularly, requirement A1 and considers that the last part of the requirement regarding inclusion of ECTS credits in the Transcript of Records and information on credit conversion in the Diploma supplement should be a recommendation (see E 6).

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2031
Ma Physics	With requirements for one year	30.09.2031

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Verify the students' total workload and adjust the awarded ECTS points accordingly for a better comparability with other international universities.

A 2. (ASIIN 5) Close the feedback cycles and inform the students directly about the results of the course questionnaires.

For the Master's degree programme

A 3. (ASIIN 1.3) Review the description of structure, curriculum and learning outcomes of the programme in the module handbook and make it consistent with the Master´s level.

A 4. (ASIIN 4.1) The module descriptions for the Master's programme need to include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies).

Recommendations

For all degree programmes

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

E 2. (ASIIN 1.3) It is recommended to strengthen the department’s ties with the industry.

E 3. (ASIIN 2) It is recommended to introduce a study week between the last lecturing week and the examinations or to spread the final exam dates over a longer period.

E 4. (ASIIN 3.3) It is recommended that the university provide more support for access licences for articles and e-books.

E 5. (ASIIN 4.1) It is recommended to review and update the module descriptions with respect to contents and literature.

E 6. (ASIIN 4.2) It is recommended to include the number of ECTS credits in the Transcript of Records and to provide information on the credit conversion in the Diploma Supplement.

E 7. (ASIIN 4.3) It is recommended to publish all the relevant rules and regulations as well as module handbooks on the department´s website to increase transparency and completeness of the available information to the stakeholders.

Appendix: Programme Learning Outcomes and Curricula

Matrix of courses and PLOs of the Bachelor in Physics programme:

		Program Learning Outcomes							
Course Code	Course Title	1	2	3	4	5	6	7	8
ARAB1060	Arabic						X	X	X
HIST1010	Oman & Islamic Civilization							X	X
SOCY1005	State and People							X	X
LANC2058	Communication in Science						X	X	X
COMP2101	Introduction to Computer Science		X					X	
MATH2107	Calculus-I		X					X	
MATH2109	Calculus II		X					X	
MATH3171	Linear Algebra & Multivariate Calculus for Engineers		X					X	
PHYS2101	General Physics I	X		X		X		X	
PHYS2102	General Physics II	X		X		X		X	

0 Appendix: Programme Learning Outcomes and Curricula

PHYS3001	Dynamics	X						X	
PHYS3005	Experimental Methods of Physics I	X		X		X	X	X	
PHYS3110	Computational Physics I		X					X	
PHYS3101	Theoretical Methods of Physics	X	X					X	
PHYS3103	Physics III	X		X				X	
PHYS3104	Modern Physics	X						X	
PHYS3106	Electronics	X		X		X		X	
PHYS4018	Thermal & Statistical Physics	X						X	
PHYS4030	Electromagnetic Theory	X						X	
PHYS4100	Optics & Lasers	X						X	
PHYS4101	Quantum Physics I	X						X	
PHYS4105	Experimental Methods of Physics II	X		X		X	X	X	
PHYS4110	Computational Physics II		X		X	X	X	X	
PHYS5003	Condensed Matter Physics I	X						X	
PHYS5105	Experimental Methods of Physics III	X		X		X	X	X	
PHYS5106	Nuclear Physics	X		X				X	
PHYS5551	Physics Project I	X	X	X	X	X	X	X	
PHYS5552	Physics Project II	X	X	X	X	X	X	X	

Curricular overview of the Bachelor in Physics programme:

	Work	Plan	
Semester 1	15 cr	Semester 2	15 cr
LANC2058	3	MATH2109	3
MATH2107	4	PHYS2102	4
PHYS2101	4	HIST1010/ISLM1010	2
ARAB1060	2	College Elective	4

0 Appendix: Programme Learning Outcomes and Curricula

University Elective	2	University Elective	2
Semester 3	16 cr	Semester 4	16 cr
MATH3171	3	PHYS3101	3
PHYS3103	3	PHYS3104	3
COMP2101	4	PHYS3110	2
Major Elective	3	PHYS3005	3
Major Elective	3	Major Elective University Elective	3 2
Semester 5	16 cr	Semester 6	15 cr
PHYS3001	3	PHYS4101	3
PHYS4030	3	PHYS3106	4
PHYS4105	3	SOCY1005	2
PHYS4018	4	Major Elective	3
Elective	3	Major Elective	3
		Summer	
		PHYS5555	1
Semester 7	14 cr	Semester 8	14 cr
PHYS5003	3	PHYS4100	3
PHYS5106	3	PHYS5105	3
PHYS4110	3	PHYS5552	4
PHYS5551	2	Major Elective	3
Major Elective	3	Major Elective	1

Matrix of courses and PLOs of the Master in Physics programme:

Course/LO	1	2	3	4	5	6
Mathematical Physics	x	x				x
Classical Mechanics	x	x				x
Quantum Mechanics	x	x				x
Classical Electrodynamics	x	x				x
Statistical Physics	x	x				x
Master Thesis	x	x	x	x	x	x
Electives	x	x			x	x

0 Appendix: Programme Learning Outcomes and Curricula

Curricular overview of the Master in Physics programme:

Year	Semester	Course Code/Name	Credits
1	Fall	PHYS6001 Classical Mechanics	3
		PHYS6002 Classical Electrodynamics	3
		PHYS6005 Mathematical Physics	3
		Total	**9**
	Spring	PHYS6003 Quantum Mechanics	3
		PHYS6004 Statistical Physics	3
		XXXXXXXX Elective	3
		Total	**9**
2	Fall	PHYS7002 Research Project	3
		XXXXXXXX Elective	3
		Total	**3**
	Spring	PHYS7002 Research Project	3
		XXXXXXXX Elective	3
		Total	**9**