



**ASIIN Seal**

## **Accreditation Report**

**Bachelor's Degree Programmes**

***Biology***

***Chemistry***

Provided by

**Umm al-Qura University, Faculty of Applied Sciences  
(Saudi Arabia), female campus in El-Zaher**

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## A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for <sup>1</sup>	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) <sup>2</sup>
بكالوريوس العلوم في علم الأحياء	Bachelor of Science in Biology	ASIIN	-	10
بكالوريوس العلوم في الكيمياء	Bachelor of Science in Chemistry	ASIIN	-	09
<b>Date of the contract:</b> 14.04.2017  <b>Submission of the final version of the self-assessment report:</b> 08.11.2017  <b>Date of the onsite visit:</b> December 13-14 <sup>th</sup> , 2017  <b>at:</b> Umm al-Qura University, Faculty of Applied Sciences (Saudi Arabia), female campus in El-Zaher				
<b>Peer panel:</b>  Prof. Dr. Gabriele Hornung, Technical University Kaiserslautern  Prof. Dr. Meike Piepenbring, University of Frankfurt  Dr. Fangfang Chu, BASF SE, Ludwigshafen  Prof. Dr. Sibylle Planitz, University of Applied Sciences Gelsenkirchen, Bocholt, Recklinghausen  Sarah Algeel, student, Technical University of Munich				
<b>Representative of the ASIIN headquarter:</b> Frauke Muth				

<sup>1</sup> ASIIN Seal for degree programmes

<sup>2</sup> TC: Technical Committee for the following subject areas: TC 09 – Chemistry; TC 12 – Mathematics; TC 13 – Physics.

<b>Responsible decision-making committee:</b> Accreditation Commission for Degree Programmes	
<b>Criteria used:</b>  European Standards and Guidelines as of 15.05.2015  ASIIN General Criteria as of 28.03.2014  Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 09.12.2011	

## B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF <sup>3</sup>	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 Biology	Bachelor of Science in Biology	-	6	Full time	no	8 Semester	141 credit hours (249 ECTS)	Fall Semester 1981
Bachelor of Science in Chemistry	Bachelor of Science in Chemistry	-	6	Full time	no	8 Semester	137 credit hours (226 ECTS)	Fall Semester 1982

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

For the Bachelor's degree programme, Biology University Umm Al-Qura has presented the following profile in the Self-Assessment Report:

"The objective of biology study program is to educate professionals in the field of biology. Students should develop general skills for acquiring, analysing and synthesizing fundamental concepts related to natural sciences and biology. In addition, students develop skills for application of the gained knowledge and efficient laboratory skills. Upon completion of the course of study in biology students are qualified for work in sectors such as industry, agriculture, medicine and other sectors where biological knowledge and skills can be applied. They are also qualified for work in research and development laboratories as well as in institutions for nature conservation.

The degree program in biology offers the student's possibilities to understand the basic biological processes common to all organisms in order to understand the world. The objective of program is that the students will demonstrate adequate knowledge about the important biological processes, particularly those at the molecular, cellular, and ecosystem levels. The major undergraduate courses in biology (Bachelor of Science, B.Sc. Degree) serve as a basis for postgraduate study in the life sciences. School of life sciences graduates have gone on to advanced graduate study, leading to careers in faculty or university teaching, basic and applied research, and public health. Other graduates have gone directly into secondary (high school) science teaching, the biomedical industry, independent laboratory research, natural resources management, or environmental education.

Biological sciences undergraduate degree program aims to diversely train its students, enabling graduates to pursue careers or advanced degrees in life and health sciences, research, industry, or governmental work. Biology program is designed to give students broad knowledge in all biological disciplines that include: environmental pollution, molecular biology, biotechnology, plant and animal ecology, plant taxonomy, comprehensive biology and evolutionary biology. All biology undergraduate students must complete a minimum of 137 credit hours."

For the Bachelor's degree programme, Chemistry University Umm Al-Qura has presented the following profile in the Self-Assessment Report:

#### **"Vision of Chemistry Department**

To make up for shortfall in the job market and training in the field of chemistry to promote our country in the fields of education, scientific research and industry through providing high quality education in line with international standards and principles.

### **Mission of Chemistry Department**

To prepare a generation of qualified national scientists and researchers to meet the needs of the job market, and to effectively contribute in solving scientific and industrial problems facing the development plans in the Kingdom of Saudi Arabia.

### **Objectives of Chemistry Department**

- Graduating competent and specialized national scientists required to serve the community and the development plans, programs, education and industry in the Kingdom.
- Conducting academic and applied scientific research.
- Contributing to the dissemination of scientific awareness through organizing scientific conferences and symposia.
- Providing technical services in the field of chemistry for the public and private sectors.”

## C Peer Report for the ASIIN Seal

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

<b>Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)</b>
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**Evidence:**

- Learning objectives of each degree programme according to the SAR (Self-Assessment Report) and the objective-module matrices
- Study plans of the degree programmes
- Module descriptions
- Webpage Umm Al-Qura: <https://uqu.edu.sa/en>
- Webpage Department of Biology: <https://uqu.edu.sa/en/dbiology>
- Webpage Department of Chemistry: <https://uqu.edu.sa/en/chmscimm>

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

The university informs about the vision, objectives and learning outcomes of the degree programmes at several institutional levels (university, college, department). Thus, the provided documentation is well suited to assess whether a respective set of learning outcomes does adequately reflect a given standard.

According to the intended learning outcomes of the Bachelor's degree programmes Biology and Chemistry, the university aims to prepare students for the current labor market needs. The main business in the region of Makkah is created through Hadj and Umrah. The influx of millions of pilgrims coming to Saudi Arabia each year creates an own industry and thus employment. Examples of typical employment areas linked to Hadj and Umrah are, according to the programme coordinators and graduates, poison control, crowd management, food safety, and the prevention of infectious diseases. The auditors suggest also focusing on environmental issues like environmental pollution, nature conservation, and landscape architecture.



The auditors base their assessment on the provided learning outcomes on the website and in the Self-Assessment Report. For the degree programmes under review there are currently two active study plans. To provide a consistent assessment of the learning objectives in relation to the curriculum, the audit team concentrates on the study plan version 2016/17 (1437).

The peers refer to the Subject-Specific Criteria (SSC) of the Technical Committee Life Sciences as a basis for judging whether the intended learning outcomes of the Bachelor's degree programmes Biology as defined by UQU correspond to the competences as outlined by the SSC. They come to the following conclusions:

The graduates of the Bachelor's degree programme Biology should understand the basic biological process and be capable of applying the scientific and technological methods of biological sciences. In addition, they acquire relevant scientific knowledge in biological areas such as botany, zoology, biochemistry, biostatistics, molecular biology, biotechnology, and the related natural sciences (chemistry, physics). They learn to work in a team and to carry out practical work in a laboratory and in the field. The purpose is to educate biologists that can work competently in biological laboratories, private companies, or institutions working on nature protection. Finally, the graduates should be capable of conducting scientific investigations.

With respect to the Bachelor's degree programme Chemistry the intended learning outcomes mention that the students should acquire essential competencies in the natural sciences and the fundamental areas of chemical sciences (organic, inorganic, physical, analytical, and theoretical chemistry). In addition, the graduates should learn about the different chemical concepts and be able to carry out practical work in the laboratory. They also should be familiar with experimental methods of chemistry, chemical hazards and safety tools, have a sound knowledge of safety and environmental issues. Finally, the graduates should be capable of conducting scientific work.

The graduates of the Bachelor's degree programme Chemistry have several job opportunities; they can work in the chemical, pharmaceutical, mining or petrochemical industry, at universities as well as in research institutes or in the public administration.

In summary, it is plausibly demonstrated that the discipline-related skills and competences being defined for the Bachelor's level in the respective Subject-Specific Criteria (SSC) of the ASIIN Technical Committees are broadly covered by the learning outcomes of the degree programmes. The auditors are convinced that the intended qualification profiles of all degree programmes under review allow the students to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the objectives set for them. The auditors judge the objectives and learning outcomes

of the degree programmes suitably reflecting the intended level of academic qualification. The intended learning outcomes also sufficiently correspond with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences (Biology) respectively of the Technical Committee 09 – Chemistry.

In general, the Bachelor's degree programmes correspond with the qualifications according to the European Qualifications Framework level 6 (Bachelor).

The auditors note that the degree programmes are offered fully (Chemistry) or partially (Biology) in English. The curriculum includes two courses for providing students with the necessary general and discipline-specific English proficiency. The respective learning outcomes, however, do not include any reference to the ability to communicate in English as the internationally accepted scientific language. Furthermore, success in foreign countries requires intercultural competences and the ability to read and comprehend new publications impacting the field.

Some of the above-cited learning outcomes of the Bachelor's degree programme Biology are held in rather general terms. For this reason, the auditors recommend wording the learning outcomes more detailed and programme-specific.

According to the programme coordinators, the degree programmes aim at preparing students equally well for a scientific career and for work in industry or public administration. This requires gaining competencies in carrying out independent academic work, demonstrated, for instance, via a graduation project. However, not all graduation projects perused during the visit do reflect an adequate scientific level. (This is discussed in more detail under Criterion 3.)

The auditors initially have some doubts about the employability of the female students in the local industry. Statistics on progression, dropout and employment were not provided for the Bachelor's degree programme Chemistry. For the Bachelor's programme Biology, the unemployment rate was at 78 percent according to statistics provided during the auditing visit. The auditors learn from the conversations with programme coordinators, graduates and employers that the need for female graduates has recently been increasing strongly. Due to the new economic "Vision 2030", which reflects the need for diversification of the Saudi Arabian economy. One of its elements with specific impact on the employability of female graduates is that companies received tax benefits if they hire female employees. Based on the information received on site, and on the testimonials by graduates of the recent promotions, the auditors' preliminary assessment is that the demand for female graduates from both degree programmes has been adequately demonstrated. They, however, ask the university to provide missing statistics on the employment rate of the graduates from the Bachelor's programme Biology.

The auditors discuss with the programme coordinators the possibilities of the students to becoming high school teachers. If the graduates want to pursue a teaching career and become a high school teacher, they must continue their studies with another degree programme that usually takes one year. During the discussion with the employers, the auditors also learn that becoming a high school teacher is still one of the most important job perspectives for the graduates. However, the graduates also have the opportunity to find an adequate occupation in a private company.

The university holds annual meetings with relevant stakeholders to identify the gaps between the graduates' qualification profile and market needs. The auditors find that the objectives and learning outcomes of both degree programmes are analysed on a regular basis and developed further, if necessary.

<b>Criterion 1.2 Name of the degree programme</b>
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**Evidence:**

- Self-Assessment Report
- Webpage Department of Biology: <https://uqu.edu.sa/en/dbiology>
- Webpage Department of Chemistry: <https://uqu.edu.sa/en/chmscimm>

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

The audit team confirms that all degree programme titles reflect the intended aims and learning outcomes as well as the main course languages Arabic and English. Information about the degree programmes is published in Arabic and English.

<b>Criterion 1.3 Curriculum</b>
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**Evidence:**

- Self-Assessment Report
- Study plans of all degree programmes
- Module descriptions
- Webpage Umm Al-Qura: <https://uqu.edu.sa/en>
- Webpage Department of Biology: <https://uqu.edu.sa/en/dbiology>
- Webpage Department of Chemistry: <https://uqu.edu.sa/en/chmscimm>

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

On the department-specific websites information about the degree programmes is published. The auditors welcome that each departmental website entails the description of the curriculum. For chemistry, the curriculum is accessible via the Arabic version of the Chemistry Department. Information on courses / modules of the degree programmes were at the time of the auditing visit not consistently published on the website. Nevertheless, the curricula of both degree programmes could be assessed on site, as the programme coordinators provided the audit team with printed module descriptions.

As outlined under criterion 1.1, the audit team could see that the learning outcomes of the programmes match - with some limitations - the outcomes stated in the Subject-Specific Criteria (SSC) of the ASIIN Technical Committees for Biology and Chemistry.

The auditors base their assessment whether the curricula of the different degree programmes achieve the intended learning outcomes on the provided module descriptions, the sample exams, and the perused Bachelor's theses.

Nature conservation is mentioned among the possible work sector for graduates. The subject nature conservation, however, is lacking among the modules. There is a module called „Environmental pollution“. Environmental problems, however, also include desertification, deforestation, lowering of the groundwater table, illegal hunting, climate change, loss of biodiversity, lack of environmental education, etc. A possible module would be “Nature Conservation”.

The audit team concluded that the imparted discipline-specific curricular content of both programmes generally correspond to the state of the art and is adequate for the Bachelor's level. The courses are suitable to implement the intended learning outcomes in a comprehensive manner. The students present during the auditors' visit confirm that the curricular content and learning outcomes match their expectations at the time of enrolment.

Exception: The auditors found that in the current curricula, scientific skills are not included in a sufficiently consistent manner. This could for example be solved either at curriculum level via expanding the existing scientific writing classes in the introductory weeks and make them a regular curriculum content stretching over a whole semester. At module level, the introduction of small writing assignments in subject-specific courses could from early semesters on help lifting students up to the required scientific level. This also relates to the deficits found in the graduation projects.

In addition, the auditors have doubts concerning the imparted practical experiences during the studies. At curriculum level, this is connected to the fact that the internships (so-called

summer trainings) entailed in the study plans of the degree programmes are not mandatory. Since the beginning of the academic term 2016/2017, students of both degree programmes have the option to gain practical experience in the course of an internship between spring and fall term of the last year of study. The internship (called “summer training”) is usually carried out over 6 weeks during summer time outside the regular semester periods.

The auditors gain the impressions that these summer trainings provide a decisive benefit in terms of practical experience to the students’ qualification profile. This was confirmed during the conversations with employers and graduates. Often would companies that offer internships hire the same students after their graduation. In the auditors’ view, graduates who do not complete such a summer training would lack the necessary practical experience that would qualify them to enter the labor market. They therefore strongly recommend making summer trainings a mandatory part of the curriculum (see also Criterion 2.1).

For both degree programmes, it should be strongly considered to introduce elements of practical experience such as more individual lab work (Chemistry programme) and field trips (guided tours and practical work in the field) to explore regional / national fauna and flora (Biology programme) in the curriculum. Finally, the auditors note that the female students do not have enough lab equipment for sufficiently training their practical lab skills (see also Criterion 4 on resources).

Furthermore, the auditors note that the curricula of all degree programmes entail several courses that do not directly relate to the subject-specific qualification profile of the future graduates. These are, for example, Holy Quran, Islamic Culture, and Arabic language. The auditors understand that the unique location of UQU in the city of Makkah justifies a specific profile with an emphasis on Quran and Islamic studies. They are, however, not convinced that there is a strong case for making Arabic language a compulsory course within natural sciences curricula. They hold instead the view that each student starting a degree programme at the College of Applied Science should have sufficient speaking, reading, and writing skills in Arabic. As a result, the auditors suggest changing the compulsory class in Arabic language into an elective.

With respect to the so far missing opportunities for the students to choose classes according to their own personal interests, the auditors suggest introducing electives in all degree programmes under review. For instance, courses in the areas of biochemistry, technical chemistry, toxicology and biophysics would be useful for creating more opportunities for students to specialize and to make them even more attractive for the job market.

<b>Criterion 1.4 Admission requirements</b>
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**Evidence:**

- Self-Assessment Report
- Webpage Umm Al-Qura: <https://uqu.edu.sa/en>

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

The admission requirements to all degree programmes are based on three elements: the overall high school degree, a general aptitude test that must be passed by all future students, as well as a test specifically designed for applicants to the degree programmes linked to the College of Applied Science.

The results are combined and weighted against a minimum threshold percentage that is defined annually for each programme. If the percentage of the combined results is beyond the minimum threshold, the student is admitted to the programme.

As specified on the university's homepage the admission requirements at UQU are:

1. The student must be Saudi national or descending from a Saudi mother (non-Saudis may apply for scholarship programs).
2. The applicant must be holding secondary school certificate (or an equivalent) from the Kingdom or abroad.
3. The secondary-school certificate must be a recent one (not exceeding 5 years). For the Colleges of Medicine, Pharmacy and Health Sciences, the period must not be longer than 2 years.
4. The student must pass all exams (aptitude test + summative test + English language test) organized by the National Center for Academic Assessment, if required by the desired department.
5. The student must pass any other exam or interview required by the college (recitations, judicial studies, physical education, art education, Sharia, etc.)
6. The applicant must not have been dismissed from the University or any other university for punitive purposes.

The auditors found that the admission requirements are suitable to ensure the subject-specific qualification of school graduates applying for admission at UQU.

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

The peers thank UQU for clarifying that the Field Training/Summer Training/Internship in all degree programmes under review is mandatory for all students. Assessment includes a written report and an oral presentation. This is stated in the Field Training course description.

With respect to the Chemistry programme, the peers acknowledge receiving the requested additional documents, namely the complete module descriptions and the current study plan 1437. This includes a description and guidelines for the graduation project. In addition, the module handbook is now available on the website of the Chemistry Department both in Arabic and in English.

The peers stress that in particular for botany, female biology students must have the opportunity to go into the field on their own for collecting sample, experiencing the ecology, and organismic diversity. Only by such field trips, a real understanding of nature and the challenges of nature conservation can be achieved. Moreover, it would be very useful, offering additional classes concerning nature conservation in order to meet current local and global environmental challenges.

The peers consider criterion 1 to be fulfilled for the Bachelor's degree programme in Chemistry.

For the Bachelor's degree programme in Biology, criterion 1 is only partly fulfilled, because offering mandatory scientifically guided field trips must be offered for female students.

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

<b>Criterion 2.1 Structure and modules</b>
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**Evidence:**

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions

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

The structure of the curriculum of the degree programmes under review are considered generally plausible, consistent and – with the reservations made in the previous chapter (see criterion 1.3) – adequate with respect to the intended learning outcomes.

Each curriculum is composed of modules (here named “courses”) which the auditors perceive as comprehensive and self-contained teaching and learning units. Apart from the graduation project and the internship (summer trainings), the auditors found that the modules also have a generally plausible range of contents and credit hours / credit points each (see following chapter).

The optional internship (“summer training”) for the Chemistry programme takes place between the sixth and the seventh semester and is credited with 3 points.<sup>4</sup> The Graduation Project takes place in the eighth semester and is credited with 3 credit points.

In the Department of Biology, the graduation project takes place in the seventh semester (Ba Biology) and is credited with three credit points. The optional internship (“practical field training”) is included in the curriculum overview<sup>5</sup> and in practice takes place after the eighth semester, after the research project. It is credited with 4 credit points. The auditors understand that one of the reasons for the internship taking place after the eighth semester are that it is currently an optional part of the studies. They also understand that the internship can facilitate entrance to the labor market and will ideally lead to a seamless transition to employment. As mentioned before, they strongly recommend making the internships a mandatory part of all curricula of the programmes under review.

In general, the undergraduate degree programmes are designed to be completed within four academic years. As the intake for study plan 37 only started in fall semester 2016/2017, the auditors find it hard to assess how large a share of students are actually able to complete their studies within the foreseen timeframe. Therefore, they look at the statistical data from the most recent study plans 33 and 19. Figures for admission, dropout and graduation were, however, only available for the male students in Biology programme. Therefore, the audit team asks the Department of Chemistry and the Department of Biology to provide statistical data on student progression (number of intakes and graduates) and dropout rates.

The audit team notices that studying abroad has so far not been foreseen as an option for the undergraduate programmes under review. According to the auditors’ enquiries with students and graduates present during the visit, almost all graduate students present in the

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<sup>4</sup> Website of the Chemistry College, Study Plan version 37, retrieved 23.12.2017.

<sup>5</sup> Website of the Biology College, Study Plan version 37, retrieved 23.12.2017.



meeting would use a scholarship to do their Master's degrees abroad. In general, almost all students of the degree programmes expressed their interest in studying abroad.

The university also offers own Master's degrees in Chemistry and Biology. As students for these Master's degree programmes are being recruited mainly from the Bachelor's level, this would be – in the auditors' view – another reason that it may be worthwhile to introduce international mobility at undergraduate level.

The audit team points out that the option to study abroad at other higher education institutions which currently depends on the individual effort of each student, should be systematically supported by the college and the university. Exchange agreements should be established with foreign universities and the possibility to study abroad should be actively promoted.

<b>Criterion 2.2 Workload and credits</b>
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**Evidence:**

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions

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

According to the Self-Assessment Report, one credit point corresponds to roughly 30 hours of workload – including both contact hours and independent study (Chemistry), or at least including both contact hours and exam preparation (Biology). However, during their visit, the audit team is not convinced that the credit points awarded always correspond to the actual workload of the students.

The auditors gain the impression that the credit hour system used in the Saudi Arabian higher education system is primarily based on the attendance time of students, not on their actual workload, which would also include working hours of individual self-study.

In many courses there seems to be a discrepancy between the actual workload and the credit points awarded. The students confirm that they spend much more time on some courses, especially the graduation project and the summer training than is reflected by the awarded credit points. Consequently, the auditors see that it is necessary to register and systematically analyse the students' workload, especially in degree programs whose curricula have been revised and further developed. Therefore, they expect the Department of Chemistry and the Department of Biology to carry out a survey of the students' workload and to make adjustments in case of discrepancies regarding the current allocation of credits.

With view to the importance for gaining the necessary practical experience and thus labor market qualification, the auditors found that summer training is an essential part of the curriculum. It should be described adequately in the module handbook, and be credited in a way that reflects the actual workload of the students. The same issue is valid for the graduation project.

<b>Criterion 2.3 Teaching methodology</b>
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**Evidence:**

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions

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

The two Bachelor's degree programmes at UQU are full-time programmes with classroom and self-study activities. Class attendance is mandatory for all courses.

A range of didactical methods is applied in all degree programmes, to make sure that the students achieve the intended learning outcomes. Among them are traditional lectures, classroom and laboratory exercises, assignments, project work, online learning and seminars.

However, from the discussions on site, the auditors gain the impression that for the Bachelor's programme Chemistry, the scope of individual lab work that the students are exposed to is not sufficient to gain the required skills and experiences. The current practice of carrying out lab experiments in group work should be changed to individual work. Lab assistants should be hired to unburden the teaching staff from preparing lab experiments (see Criterion 4 on Resources).

In the Bachelor's programme Biology, the current teaching methodology is primarily based on lectures and seminars inside the campus buildings and its biology museum. Encounters with living plants and animals happen in the limited space of the small botanical garden or the campus area. Real field excursions to the fauna and flora of Saudi Arabia are not formally foreseen. The auditors think it essential for the attainment of the learning outcomes for the Bachelor's programme Biology to include real field visits into the range of teaching methods.

The auditors positively note that online learning groups are used on specific topics where female and male students work together on specific topics. Discussions between teachers

and students are also carried out via Whats-App groups, which allow direct and real-time communication, also beyond the regular lecture and university hours.

In general, the auditors see that – apart from the mentioned exceptions – the teaching methods employed are appropriate to support the attainment of the intended learning objectives.

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

##### **Evidence:**

- Self-Assessment Report

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

The auditors acknowledge that there are sufficient resources to guarantee support and counselling for students.

To provide guidance and assistance in the programme planning, students are assigned an academic advisor in the beginning of their studies. Involved in support and assistance are furthermore tutors, programme coordinators, teaching staff, as well as the members of the Careers and Employment Service. The teaching staff provides office hours for meeting students every semester. The department's course coordinator and the vice dean for academic affairs have an overall responsibility for student guidance problem solving and academic / non-academic counselling.

Both staff and students seem highly involved in the academic activities. Good relationships evidently exist between students and staff members. Reportedly, the teaching staff is highly responsive towards the students' needs and complaints. Students actively use the mentioned Whats-App groups to raise ideas, questions, and challenges. The students express their general satisfaction with responsiveness of the teachers to their needs.

The auditors commend the university on their dedication towards students' support and assistance, which is reflected in the dedication and contentment of the students with their teachers, this is explicitly expressed in the conversations with the auditors.

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

The peers appreciate that Chemistry Department has submitted some statistical data on enrolment, dropouts, and graduation for female students together with its statement on the report. They would welcome an evaluation by UQU of those numbers.

Although, the Chemistry Department ensures that the workload of the Research Project (2 credit hours) is sufficient for conducting the project, the peers still think that it is necessary to verify the time the students spend on the Research Project and to award the credits accordingly. For this reason, they expect UQU to provide conclusive documents in the course of the fulfilment of requirements.

Taking UQU's response into consideration, the peers judge criterion 2 to be mostly fulfilled.

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

<b>Criterion 3 Exams: System, concept and organisation</b>
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**Evidence:**

- Self-Assessment Report
- Module descriptions

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

As stated in the Self-Assessment Report, there is a period for midterm exams and a period for the final exams. Student performance is not only evaluated on the basis of the final examination. Assignments, laboratory work, homework, mid-term exam, and seminar work may contribute to the final grade of a course. Examinations are typically written exams, such as essays, problem-solving or case-based questions and calculation problems. The form of the exams for each module is specified in the module descriptions, the examinations are scheduled according to the academic calendar. To make up for a failed examination, a student must retake the course in the summer semester or the regular course in the next academic term. The summer semester is an optional third term designed for students who have credit deficits and have failed some exams.

There is also an ongoing monitoring of the individual student's study progress. This is carried out by the teaching staff based on the student's attendance and preparedness for the classes.

The auditors see that the College of Applied Science apparently cares a lot about the interdependency between the wording of viable learning outcomes and appropriate assessment methods. The examination methods include, depending on the subject and the intended

learning outcomes, mid-term and final examinations, laboratory works, subject-specific assignments and projects. Notwithstanding, the structure of written examinations reflects that students mostly learn by heart. Considering this, the prevalence of written assessments with questions referring to names and terminology and the fact that there are almost no oral assignments, the auditors doubt whether the assessment methods adequately prepare the students for their future careers. Consequently, the auditors recommend stronger aligning the form of examination with the intended learning outcomes of the respective module and introducing more competence-oriented examination methods like oral examinations or presentations.

The relevant rules for examination and evaluation criteria including re-sits, disability compensation measures, illness and other mitigating circumstances are transparently put into a legal framework, as both students and lecturers confirm in the course of the discussions. On request, the students describe the organization of examinations as appropriate and responsive to their needs. This judgment explicitly includes the policy of retaking the course in the case of a failure.

During the audit, the auditors inspect several sample exams and final theses (graduation projects). They notice that not all theses corresponded to the expected scientific standard. The auditors underline that all students must learn about scientific working standards and ethics and must know and be able to apply tools and concepts of writing scientific publications. Furthermore, it must be guaranteed that the individual contribution of each student must be apparent and traceable if the Bachelor's thesis is prepared in group work, and that each contribution is graded individually. In addition, the group size for the graduation project should not exceed three students.

The auditors conclude that the degree programmes need to be aligned to international standards with respect to the scope of the Bachelor's thesis (graduation project) so that the students have the chance to continue their academic education abroad or to find an adequate job after graduation. Measures should be taken to guarantee an adequate scope and academic quality of the Bachelor's thesis and that the learning outcome "ability to work scientifically" is met in all cases. For example, a manual for the teachers could be designed that clearly defines joint standards for the graduation project.

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

The peers understand that the courses are not only evaluated by the final examination (which is usually a written exam), but other examination methods such as assignments, laboratory work, homework, mid-term exam, and seminars also contribute to the final

grade. The details are mentioned in the module descriptions. Nevertheless, the peers are still convinced that it would be useful to better align the examination forms with the intended learning outcomes of the module and to conduct more oral examinations.

A final thesis is a compulsory part of the degree programmes and the peers have no doubt that all students are participating as required. However, they insist that the individual contribution, in case of a group work, must be apparent. The group must not be larger than three students and the form, scope and quality of the research project has to be comparable to international standards. UQU needs to submit conclusive documents verifying that the graduation project meets the intended scientific standards and make transparent the individual contribution of each student.

The peers consider criterion 3 to be partly fulfilled.

## 4. Resources

<b>Criterion 4.1 Staff</b>
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**Evidence:**

- Self-Assessment Report
- Staff Handbook
- Annual Programme Report Biology 2016/17
- Annual Programme Report Chemistry 2016/17

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

At UQU, the staff members have different academic positions. There are professors, associate professors, assistant professors, lecturers and demonstrators. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. For example, a full professor needs to hold a PhD degree. Moreover, the responsibilities and tasks of a staff member with respect to teaching load, research, and supervision depend on the academic position.

According to the Self-Assessment Report, the Department of Biology employs a total of 112 staff members (16 (3 female) professors, 12 (5 female) associate professors, 31 (23 female) assistant professors, 11 (11 female) lecturers, and 17 (17 female) demonstrators). In addition, there are 24 staff members that receive a scholarship for doing their PhD abroad. Therefore, they are currently not teaching at Department of Biology. All academic personnel belong to one of the three areas of the department: Botany, Zoology, or Microbiology.

The auditors point out that in the Department of Biology most of the female staff members are “only” assistant professors, lecturers or demonstrators, whereas most of the full professors and associate professors are male.

The majority of the staff members are from Saudi Arabia and hold permanent positions; the employment contracts for the non-Saudi teachers are limited to one year and need to be renewed annually. Since the auditors did not receive a complete staff handbook from the Department of Biology, they ask UQU to submit this important information.

The composition of teaching staff in the Department of Chemistry is also based on the five categories: demonstrator (29), lecturer (20), assistant professor (29), associate professor (13) and professor (16). The distribution between male and female staff members is not mentioned in the Self-Assessment Report, but during the audit, the auditors got the impression that, similar to the situation in the Department of Biology, most professors and associate professors are male and most female staff members are demonstrators, lecturers, or assistant professors. Of the total 106 staff members, 19 are on one-year contracts positions with UQU. They are coming from different international universities (e.g. Egypt, Sudan, and Syria). The auditors were provided with a complete staff handbook from the Department of Chemistry as an appendix to the Self-Assessment Report.

The auditors discuss with UQU’s management about the university’s policies with respect to hiring new staff members. They learn that the College of Applied Science is asked to submit an annual strategic plan that describes what staff vacancies there are and what specific needs the college has. The report takes the current situation and future planning into consideration. Vacancies and job specifications are announced on UQU’s webpage; only if there are no qualified Saudi applicants the hiring is done internationally.

During the audit, the auditors learn that most staff members in the Department of Biology as well as in the Department of Chemistry conduct research activities and involve their students in these activities. The College of Applied Science edits an annual book with copies of the papers and articles published by the academic staff. The auditors are impressed by the surprising amount of high quality publications and the fact that the College of Applied Science is the faculty with by far the highest scientific output at UQU. It also receives more funds for research projects by government institutions or the private industry than any other faculty at UQU.

The auditors also appreciate that most of the staff members have acquired their PhD outside Saudi Arabia, e.g. in UK, Germany or Japan. They encourage the College of Applied Science to continue this policy and to send as many staff members as possible abroad for postgraduate education.

Apart from gender imbalance, the only weak point the auditors notice is the apparent lack of sufficiently trained lab technicians. The teachers as well as the students confirm during the audit that the regular maintenance and basic knowledge for usage of the laboratory equipment is a problem and that it often takes too long to repair the laboratory apparatus in case of a break down. For this reason, the auditors suggest employing and training more technicians. For example, it seems useful to the auditors to send some of the technicians abroad in order to train them in the use and the maintenance of sophisticated laboratory equipment.

The auditors are very impressed by the excellent and open-minded atmosphere among the students and the staff members, this atmosphere of understanding and support is one of the strong points of the degree programmes.

In summary, the auditors confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes.

<b>Criterion 4.2 Staff development</b>
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**Evidence:**

- Self-Assessment Report
- Staff Handbook

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

According to the Self-Assessment Report, the aim of the College of Applied Science is to create a good working environment for its staff members, and to support their professional development and well-being at work. At UQU, the Vice Rector for Quality and Skills Development is responsible for these tasks. He annually revises the measures for professional development and expertise and decides on the focus areas of personnel training at UQU. In order to achieve its goals, UQU organises training workshops for the staff members who aim at strengthening the practical teaching competences and the didactic methods. In addition, UQU offers special courses for the utilization of computer and e-learning programmes. The teachers are also obliged to participate in management training programmes organized by the university or the faculty. Based on the course evaluations all staff members take part at annual performance and development discussions with their Head of Department. During the talk, goals for the further development and the needed individual training are set.



The auditors discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at UQU. During the audit, the teachers confirm towards the auditors that they have the opportunity to attend and participate at international meetings and workshops in their field of specialization either by delivering lectures, or by presenting research results.

In addition, there is an academic incentive programme for teachers. The possible financial benefits are based on research performance, academic development, tutoring, awards and teaching evaluations. Moreover, there is a possibility for a sabbatical leave every five years e.g. for joining international research programmes.

In summary, the auditors confirm that UQU offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and teaching skills.

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

##### **Evidence:**

- Self-Assessment Report
- On-site visit of the laboratories, lecture rooms, and the library

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

As mentioned in the Self-Assessment Report, the College of Applied Science has 25 classrooms and 200 computer workplaces in 9 labs and seminar rooms for group work. On the College's premises, there is a restaurant and a cafe available for students and staff members; there is also a student health center.

Students can use the computers that are in common use in the library area or bring their own laptops. The university's Information Services and Technology (IT) Unit is responsible for the computers, software and data systems. Centralized services, such as the learning environments can be accessed also from outside of the campus. The databases available to the students include information about both printed and electronic books as well as current scientific journals. Electronic books can be accessed via a link to the library catalogue. The library provides its customers with library and information services both on-site and online.

The auditors are impressed by the modern central library that offers direct access to international literature, scientific journals, and publications. The students also express their satisfaction with the library and the available literature. From their point of view, there is sufficient access to current international literature and databases and a remote access is possible.

The auditors discuss with representatives of UQU's management about the funding and the available financial resources for the College of Applied Science. They learn that the largest share of the overall funds for teaching and equipment derive from governmental sources. Another possible sponsor is the King Abdulaziz City for Science and Technology (KACST), an independent scientific organisation that is essentially Saudi-Arabia's national science agency and reports directly to the Saudi Arabian Prime Minister. KACST is primarily concerned with proposing, developing and implementing strategies for the advancement of science and technology within and beyond the nation. Private companies provide additional contributions. The auditors understand that the governmental funding is closely linked to the number of students admitted to UQU and that the funding is secured for the next years. For distributing the available financial resources within UQU, each College has to submit an annual plan that lists its needs and requirements. Based on these annual reports and the priorities of the colleges UQU's management decides upon the allocation of the budget.

During the audit, the peer group visits the laboratories and the classrooms in order to assess the quality of infrastructure and technical equipment. They notice that there are no severe bottlenecks due to missing equipment or a lacking infrastructure. The basic technical equipment is available in sufficient numbers although some of it is not state of the art; there are not enough funds for maintenance and there is an evident lack of qualified technicians. The students confirm during the discussion with the auditors that in general they are satisfied with the available equipment for teaching only some materials for the laboratory work are missing and some of the technical equipment is outdated. In the Chemistry programme, students must do simple spectroscopic measurements (Infrared and UV-vis spectroscopy) themselves and thus get acquainted with modern analysis machinery.

The peer group understands that modern equipment for sophisticated analysis is available mostly on the male campus and that female students performing investigation for their Bachelor project currently have access to this equipment only during weekends. The female students' investigation activities should be supported by modern equipment available on the female campus.

The auditors point out that light microscopes are available in the Department of Biology in adequate numbers, so in the course of the practical work students can analyse microscopic preparations individually and carefully. Dissecting microscopes, however, are apparently not available for each student. This would be important, because dissecting microscopes allow observing specimens from the field or preserved specimens macroscopically with a higher magnification. They are indispensable to understand small structures, the exact location of sections for light microscopy, and to make thin sections for light microscopy. Students have to make their own sections for light microscopic observation. Otherwise, they

will not be able to relate the structures observed with the light microscope to their structural and functional context of the complete organism.

Furthermore, the botanical garden on the female campus is currently very small and should be extended. Both, male and female biology students need to have access to a botanical garden with plants labelled with information on scientific species names, common names, names of the respective family and geographical distribution of the species.

Although all students have the opportunity to carry out laboratory experiments, compared to international standards the amount of hands-on experimental and problem solving oriented laboratory work needs to be increased. For this reason, the auditors expect UQU to provide a concept, a reliable financial plan, and a timetable for upgrading the technical equipment in the laboratories and to initiate first steps for its implementation.

The auditors recognize that the Department of Chemistry has introduced a safety system in all areas, including storage and qualified disposal of chemicals and regular introduction of the students to safety measures before starting lab work. The auditors still perceive a need to fortify measures (e.g. storage of chemicals and gas cylinders, work safety and quality assurance). The auditors point out that international quality and safety standards must be met. They appreciate that UQU is currently building a central research laboratory that will be furnished with sophisticated and advanced technical equipment. A detailed concept for the different laboratories and their technical features already exist. The establishment of the central research laboratory will help UQU and especially the College of Applied Science to further increase the research activities and to better involve the students in them.

The auditors learn that a new female campus will shortly be built adjacent to the male campus. This offers a chance of fully complying with safety standards, of improving lab equipment and lab access and will facilitate joint use of sophisticated equipment.

Besides the already mentioned restrictions, the auditors judge the available funds, the technical equipment, and the infrastructure (laboratories, library, seminar rooms etc.) to comply with the requirements for sustaining the degree programmes

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

The peers consider criterion 4 to be mostly fulfilled.

## **5. Transparency and documentation**

<b>Criterion 5.1 Module descriptions</b>
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**Evidence:**

- Self-Assessment Report
- Module descriptions
- Webpage Umm Al-Qura: <https://uqu.edu.sa/en>

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

During the audit and via internet the auditors received module descriptions from the Bachelor's degree programme Biology. The module descriptions of the Bachelor's degree programme Chemistry were available as downloadable appendices to the Self-Assessment Report.

The students, as all other stakeholders, have access to the module descriptions via UQU's homepage.

After studying the module descriptions the auditors confirm that they include information about the persons responsible for each module, the teaching methods and work load, the awarded credit points, the intended learning outcomes, the content, the applicability, and the admission and examination requirements. The auditors point out that the module descriptions do not always clarify, which type of assessment exactly is used, how long the exams take, and how the final grade is derived from the different assessing methods.

In addition, the auditors notice some deficits in specific module descriptions. Concerning the course „Plant Kingdom“, the topics of this course should be organized according to the most recent systematic hypotheses: bacteria, chromista, fungi, and other life forms. The course “Mycology and Plant Pathology” should not only cover fungi but also many other organisms (viruses, bacteria, animals) that are relevant for cultivated plants. Otherwise, the title of the course is not adequate and should rather be called “Mycology”. Moreover, it is necessary to use scientific names in accordance with international standards (e.g., zoosporic fungi instead of “whipworm fungi”, group/division instead of “department”, slime moulds? instead of “fungi gels”, *Saprolegnia* instead of *sabreaulegnia*, *pythium* instead of *petheim* etc.; comp. the description of the mycology module in the Microbiology curriculum).

Another aspect the auditors criticize are the outdated bibliographical references. The auditors recommend referring to recent, up to date literature in the module descriptions, because some of the presently mentioned papers and textbooks are more than 10 years old.

Furthermore, the module handbooks of all degree programmes under review do not include module descriptions for the classes offered by other faculties (Quran Studies, Islamic Culture, Arabic Language, and English) and the Bachelor's thesis (Graduation Project). Since the auditors need to have a complete picture of all classes offered they ask UQU to provide the missing module descriptions.

<b>Criterion 5.2 Diploma and Diploma Supplement</b>
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**Evidence:**

- Self-Assessment Report
- Sample Transcript of Records for each degree programme
- Sample Diploma Certificate for each degree programme
- Sample Diploma for each degree programme

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

The auditors confirm that the students of both degree programmes are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records.

The auditors point out that the Diploma Supplement should inform about the structure and content of the respective degree programme, provide information about the individual performance as well as statistical data regarding the final grade, and include information about the composition of the final grade according to the ECTS-Users' guide. This allows the reader to categorise the individual result. The currently issued Diploma Supplement is more similar to a Transcript of Records and does not follow the internationally accepted standards for a Diploma Supplement.

The auditors insist that all graduates of the degree programmes must be provided with a standardised Diploma Supplement. This way their academic qualification is more easily recognised abroad, and it offers them easier access to opportunities for work or further studies abroad. The Diploma Supplement must include the description of their academic career and the competences acquired during their studies, it must also explain the qualification gained, including the achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed.

<b>Criterion 5.3 Relevant rules</b>
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**Evidence:**

- Self-Assessment Report
- Webpage Umm Al-Qura: <https://uqu.edu.sa/en>

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

The auditors confirm that the rights and duties of both UQU and the students are clearly defined and binding. All rules and regulations are published on the university's website and hence available to all relevant stakeholders. In addition, the students receive all relevant course material in Arabic at the beginning of each semester.

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

The peers appreciate that UQU has submitted complete module descriptions for the Chemistry programme. The descriptions include the information about the responsible person and the awarded credit points. The bibliographical references were reviewed and updated. However, the mentioned deficits in the module descriptions of the Biology programme remain.

The peers consider criterion 5 to be mostly fulfilled for the Bachelor's degree programme Chemistry and partly fulfilled for the Bachelor's degree programme Biology.

## **6. Quality management: quality assessment and development**

**Evidence:**

- Self-Assessment Report
- University Development and Quality Unit in Umm Al-Qura University (Present and Future), 2016

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

The auditors discuss the quality management system at UQU with the programme coordinators and the students. They learn that there is a continuous process in order to improve the quality of the degree programmes and it is carried out through internal and external evaluation. Internal evaluation of the quality of the degree programmes is provided through several surveys. First, there is a students' survey that is conducted in all degree

programmes of UQU. It is organised centrally by the university with the purpose of evaluating the performance of the teachers. This evaluation takes place in every course and in every semester. As the auditors find out during the audit, the students are informed about the results. If there is negative feedback, the Dean of the College of Applied Science talks to the respective teacher, analyses the problems, and offers guidance. The auditors gain the impression that the teaching staff takes the students' feedback seriously and changes are made if there is negative feedback.

Secondly, the College of Applied Science also conducts a graduate survey with respect to the overall quality of the degree programmes. It is also designed to provide feedback, which allows the College of Applied Science to determine changes in the job perspectives and future plans of the graduates.

Finally, the employers are also asked to give their feedback on the qualification profile and the employability of the graduates. In addition, employers are invited to take part at the annual workshops with the programme coordinators where further development of the degree programmes and requirements of the job market are discussed.

External quality assessment of the degree programmes is provided by the National Commission for Academic Accreditation & Assessment (NCAAA) in Saudi Arabia. It was established in 2004 with the responsibility for determining standards and procedures for accrediting higher education institutions and programmes within the Kingdom of Saudi Arabia. All degree programmes under review have been accredited by NCAAA, certifying that the resources and facilities provided, the processes of teaching, the support services, and the quality and extent of students' education in terms of knowledge, skills and abilities needed for scientific practice meet the required standards.

During the discussion with the programme coordinators, the auditors learn that a Student Council was recently established but the rights and duties of its members remain somewhat unclear to the auditors. The students confirm towards the auditors that they know the members of the Student Council and that it is a new concept at UQU. In addition, the auditors find out that the students are not represented on the other boards of the College of Applied Science, especially not in the Curriculum Committee or the Faculty Council. The auditors point out that it is important to develop a culture of quality in which all stakeholders are involved in the quality assurance processes. Therefore, they strongly recommend including students' representatives in all important boards and panels of UQU.

The auditors learn from the representatives of UQU's partners from public institutions and private companies that they are regularly invited to stakeholder workshops at faculty level. On these occasions, the needs and requirements of the employers and possible changes to the degree programmes are discussed. In addition, some of the employers participate at

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the annual job fair and they also announce job vacancies to UQU so that the students can apply for the open positions. As the auditors consider the input of the employers to be very important for the further improvement of the degree programmes they appreciate the existing culture of quality assurance with the involvement of the employers in the quality assurance process.

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

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

The peers consider criterion 6 to be fulfilled.



## D Additional Documents

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

- Module descriptions of all classes taught in the degree programmes in English
- Complete Staff Handbook from the Department of Biology in English
- Current study plan for the chemistry programme, completely in English
- Statistics on drop-out rates / progression rates and employment rates of the Chemistry degree programme

## **E Comment of the Higher Education Institution (25.02.2018)**

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

- Module descriptions of all classes taught in the degree programmes in English
- Complete Staff Handbook from the Department of Biology in English
- Current study plan for the chemistry programme, completely in English
- Statistics on drop-out rates / progression rates and employment rates of the Chemistry degree programme

## F Summary: Peer recommendations (04.03.2018)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2023
Ba Chemistry	With requirements for one year	-	30.09.2023

### Requirements

#### For all degree programmes

- A 1. (ASIIN 2.2) Make sure that the actual workload of the students is consistent with the awarded credits.
- A 2. (ASIIN 3) Make sure that all students know how scientific publications are written and how scientific work is carried out.
- A 3. (ASIIN 3) Ensure that the graduation project meets the intended scientific standards and make transparent the individual contribution of each student.
- A 4. (ASIIN 4.3) Provide a concept, a reliable financial plan, and a timetable for upgrading the technical equipment in the laboratories and initiate first steps for its implementation.
- A 5. (ASIIN 4.3) Increase the technical equipment so that the female students can do the experiments on the female campus during days of the week in groups not larger than two or three. In general, an adequate ratio between students and instruments must be ensured.
- A 6. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

**For the Bachelor's degree programme Chemistry**

- A 7. (ASIIN 4.3) Upgrade the safety provision of the laboratories according to ISO quality standards.

**For the Bachelor's degree programme Biology**

- A 8. (ASIIN 1.3) Field trips to explore regional / national fauna and flora must be organised for the female Biology students.
- A 9. (ASIIN 5.1) Rewrite the module descriptions so as to include detailed information about the responsible persons, the current scientifically correct content of the course, the exact form and length of the exams and the calculation of the final grade.

**Recommendations**

**For all degree programmes**

- E 1. (ASIIN 1.3) It is recommended to introduce electives and to reduce the number of non-subject-specific classes.
- E 2. (ASIIN 2.1) It is recommended to promote the international academic mobility of the students.
- E 3. (ASIIN 3) It is recommended to stronger align the form of examination with the intended learning outcomes of the respective module.
- E 4. (ASIIN 4.1) It is recommended employing and training more laboratory assistants.
- E 5. (ASIIN 6) It is recommended to include students' representatives in the boards and panels of UQU.

**For the Bachelor's degree programme Chemistry**

- E 6. (ASIIN 2.3, 4) It is strongly recommended to extent the scope of lab work of the students to help achieving the intended learning outcomes. The current practice of carrying out lab experiments in group work should be changed to individual work. In this context, it is recommended to hire lab ordinates to unburden the teaching staff from preparing lab experiments.

**For the Bachelor's degree programme Biology**

- E 7. (ASIIN 1.1) It is recommended to revise the wording of the programme learning outcomes to make them more detailed and programme-specific.

- E 8. (ASIIN 2.1, 2.3) It is recommended to include excursions / field trips to fauna and flora into the curriculum.
- E 9. (ASIIN 4.3) It is recommended to improve the botanical garden.
- E 10. (ASIIN 5.1) It is recommended to update the bibliographical references in the module descriptions.
- E 11. (ASIIN 1.3) It is recommended offering classes concerning nature conservation in order to meet current local and global environmental challenges.

## **G Comment of the Technical Committees (16.03.2018)**

### **Technical Committee 09- Chemistry (07.03.2018)**

*Assessment and analysis for the award of the ASIIN seal:*

The Technical Committee discusses the procedure at the Umm Al-Qura University, in particular about the specific situation in Mecca (female campus accessible only to Muslims, long journey from Jeddah, many non-specific courses on Islam in the curriculum, flood of pilgrims during the Hadj). The Technical Committee agrees with the assessments of the auditors and unanimously endorses the proposed requirements and recommendations.

The Technical Committee 09 – Chemistry recommends the award of the seals as follows:

<b>Degree Programme</b>	<b>ASIIN seal</b>	<b>Subject-specific labels</b>	<b>Maximum duration of accreditation</b>
Ba Biology	With requirements for one year	-	30.09.2023
Ba Chemistry	With requirements for one year	-	30.09.2023

### **Technical Committee 10- Life Sciences (16.03.2018)**

*Assessment and analysis for the award of the ASIIN seal:*

The Technical Committee discusses the procedure at the Umm Al-Qura University, in particular about the specific situation in Mecca (female campus accessible only to Muslims, long journey from Jeddah, many non-specific courses on Islam in the curriculum, flood of pilgrims during the Hadj). The Technical Committee agrees with the assessments of both expert groups. It only suggests cancelling recommendation E 8, because it is the same as requirement A 8. Otherwise, the TC endorses the proposed requirements and recommendations.

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

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2023
Ba Chemistry	With requirements for one year	-	30.09.2023

~~E 8. (ASIIN 2.1, 2.3) It is recommended to include excursions / field trips to fauna and flora into the curriculum.~~

## H Decision of the Accreditation Commission (23.03.2018)

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

The ASIIN Accreditation Commission for Degree Programmes decides to slightly change the wording of requirements A 2 and to delete recommendation E 8. The Accreditation Commission otherwise follows the suggestions of the auditors and the involved Technical Committees.

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

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2023
Ba Chemistry	With requirements for one year	-	30.09.2023

### Requirements

#### For all degree programmes

- A 1. (ASIIN 2.2) Make sure that the actual workload of the students is consistent with the awarded credits.
- A 2. (ASIIN 3) Make sure that all students know how scientific publications are written and how scientific work is conducted.
- A 3. (ASIIN 3) Ensure that the graduation project meets the intended scientific standards and make transparent the individual contribution of each student.
- A 4. (ASIIN 4.3) Provide a concept, a reliable financial plan, and a timetable for upgrading the technical equipment in the laboratories and initiate first steps for its implementation.
- A 5. (ASIIN 4.3) Increase the technical equipment so that the female students can do the experiments on the female campus during days of the week in groups not larger



than two or three. In general, an adequate ratio between students and instruments must be ensured.

- A 6. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

**For the Bachelor's degree programme Chemistry**

- A 7. (ASIIN 4.3) Upgrade the safety provision of the laboratories according to ISO quality standards.

**For the Bachelor's degree programme Biology**

- A 8. (ASIIN 1.3) Field trips to explore regional / national fauna and flora must be organised for the female Biology students.
- A 9. (ASIIN 5.1) Rewrite the module descriptions so as to include detailed information about the responsible persons, the current scientifically correct content of the course, the exact form and length of the exams and the calculation of the final grade.

**Recommendations**

**For all degree programmes**

- E 1. (ASIIN 1.3) It is recommended to introduce electives and to reduce the number of non-subject-specific classes.
- E 2. (ASIIN 2.1) It is recommended to promote the international academic mobility of the students.
- E 3. (ASIIN 3) It is recommended to stronger align the form of examination with the intended learning outcomes of the respective module.
- E 4. (ASIIN 4.1) It is recommended employing and training more laboratory assistants.
- E 5. (ASIIN 6) It is recommended to include students' representatives in the boards and panels of UQU.

**For the Bachelor's degree programme Chemistry**

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- E 6. (ASIIN 2.3, 4) It is strongly recommended to extent the scope of lab work of the students to help achieving the intended learning outcomes. The current practice of carrying out lab experiments in group work should be changed to individual work. In this context, it is recommended to hire lab ordinates to unburden the teaching staff from preparing lab experiments.

**For the Bachelor's degree programme Biology**

- E 7. (ASIIN 1.1) It is recommended to revise the wording of the programme learning outcomes to make them more detailed and programme-specific.
- E 8. (ASIIN 4.3) It is recommended to improve the botanical garden.
- E 9. (ASIIN 5.1) It is recommended to update the bibliographical references in the module descriptions.
- E 10. (ASIIN 1.3) It is recommended offering classes concerning nature conservation in order to meet current local and global environmental challenges.

# I Fulfilment of Requirements (07.12.2018)

## Comments of the peers and the Technical Committees (23.11.2018)

### Requirements

#### For all degree programmes

- A 1. (ASIIN 2.2) Make sure that the actual workload of the students is consistent with the awarded credits.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: According to current versions of module handbooks, graduation projects in Biology are credited by 5 credit hours and in Microbiology and Chemistry by 3 credit hours. This value does not reflect the total workload. In general, the awarded credit hours only take the contact hours into account and the self-study time is not made transparent in the course specifications. There still is a misunderstanding in the way UQU should convert the actual time spent on average for a course into credit points.
TC 09	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

- A 2. (ASIIN 3) Make sure that all students know how scientific publications are written and how scientific work is conducted.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The module descriptions for graduation projects in all three degree programmes are very fine. Lectures and tutorials accompanying the final year project give detailed information and support for conducting and writing up the final year thesis.

TC 09	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

- A 3. (ASIIN 3) Ensure that the graduation project meets the intended scientific standards and make transparent the individual contribution of each student.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: On the assumption that the copies provided by UQU reflect the current average standard for graduation theses in the study programmes, international standards are clearly met and the individual contribution of each students is transparent.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

- A 4. (ASIIN 4.3) Provide a concept, a reliable financial plan, and a timetable for upgrading the technical equipment in the laboratories and initiate first steps for its implementation.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The list provided by UQU shows that first steps toward upgrading laboratory equipment have been performed. The explanation leaves in opinion no doubt that UQU will continue accordingly.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

- A 5. (ASIIN 4.3) Increase the technical equipment so that the female students can do the experiments on the female campus during days of the week in groups not larger than two or three. In general, an adequate ratio between students and instruments must be ensured.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: It is not clear how the technical equipment on the female campus has been improved and that there are enough instruments available for conducting the experiments in groups of two or three students.
TC 09	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

- A 6. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: The submitted Diploma Supplements lack in structure and academic level of the degree programmes as well as in a summary of the individual performance of the student.
TC 09	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

#### For the Bachelor's degree programme Chemistry

- A 7. (ASIIN 4.3) Upgrade the safety provision of the laboratories according to ISO quality standards.

Initial Treatment	
Peers	fulfilled

	Vote: unanimous Justification: UQU provided a detailed list for checking on a continual basis safety regulations according to internationally valid standards. The university is strongly encouraged to improve regulations, for instance, by checking fume hoods annually.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

### For the Bachelor's degree programme Biology

- A 8. (ASIIN 1.3) Field trips to explore regional / national fauna and flora must be organised for the female Biology student.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: Field trips are now a compulsory part of the curriculum for female students.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

- A 9. (ASIIN 5.1) Rewrite the module descriptions so as to include detailed information about the responsible persons, the current content of the course, the exact form and length of the exams and the calculation of the final grade.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: UQU provided copies of current module descriptions being in line with required standards.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

## Decision of the Accreditation Commission (07.12.2018)

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Biology	Requirements 1, 5, 6 not fulfilled	-	Six months prolongation
Ba Chemistry	Requirements 1, 5, 6 not fulfilled	-	Six months prolongation

The Accreditation Commission justifies its decision as follows:

The Accreditation Commission follows the judgement of the peers and the involved Technical Committees and considers requirements 1, 5, 6 to be not fulfilled.

**A1:** UQU must make sure that the actual workload of the students is consistent with the awarded credits. For example, the credits awarded for the graduation projects does not reflect the students' total workload. In general, the awarded credit hours only take the contact hours into account and the self-study time is not made transparent in the course specifications.

**A5:** It is not clear how the technical equipment on the female campus has been improved and that there are enough instruments available for conducting the experiments in groups of two or three students. UQU must provide additional documents to verify that the technical equipment on the female campus has been increased so that the female students can do the experiments in groups not larger than two or three.

**A6:** The submitted Diploma Supplements lack in structure and content. The academic level of the degree programmes as well as the individual performance of the student are not described adequately.

## K Fulfilment of Requirements (28.06.2019)

### Comments of the peers and the Technical Committees (13.06.2019)

#### Requirements

##### For all degree programmes

- A 10. (ASIIN 2.2) Make sure that the actual workload of the students is consistent with the awarded credits.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: According to current versions of module handbooks, graduation projects in Biology are credited by 5 credit hours and in Microbiology and Chemistry by 3 credit hours. This value does not reflect the total workload. In general, the awarded credit hours only take the contact hours into account and the self-study time is not made transparent in the course specifications. There still is a misunderstanding in the way UQU should convert the actual time spent on average for a course into credit points.
TC 09	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
AC	not fulfilled Vote: unanimous Justification: UQU must make sure that the actual workload of the students is consistent with the awarded credits. For example, the credits awarded for the graduation projects does not reflect the students' total workload. In general, the awarded credit hours only take the contact hours into account and the self-study time is not made transparent in the course specifications.
Secondary Treatment	
Peers	partly fulfilled Justification: The module descriptions now provide information about the total workload including self study hours. However, the



	mentioned total workload does not seem adequate for a graduation project and differs significantly between the two programmes (140 h, 5 ECTS in Chemistry and 241 h, 8 ECTS in Biology).
TC 09	fulfilled Vote: per majority Justification: The Technical Committee sees that substantial improvements have been made, however some deficits with respect to the graduation project and its workload remain. For this reason, the TC considers the requirement to be fulfilled but suggests adding a comment in the notification letter. They emphasize that UQU needs to develop uniform scientific standards for the scope and quality of the graduation project and needs to make sure that the projects meet international standards for Bachelor's theses.
TC 10	fulfilled Vote: per unanimous Justification: The Technical Committee sees that substantial improvements have been made, however some deficits with respect to the graduation project and its workload remain. For this reason, the TC considers the requirement to be fulfilled but suggests adding a comment in the notification letter. They emphasize that UQU needs to develop uniform scientific standards for the scope and quality of the graduation project and needs to make sure that the projects meet international standards for Bachelor's theses.

- A 5. (ASIIN 4.3) Increase the technical equipment so that the female students can do the experiments on the female campus during days of the week in groups not larger than two or three. In general, an adequate ratio between students and instruments must be ensured.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: It is not clear how the technical equipment on the female campus has been improved and that there are enough instruments available for conducting the experiments in groups of two or three students.
TC 09	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

TC 10	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
AC	not fulfilled Vote: unanimous Justification: It is not clear how the technical equipment on the female campus has been improved and that there are enough instruments available for conducting the experiments in groups of two or three students. UQU must provide additional documents to verify that the technical equipment on the female campus has been increased so that the female students can do the experiments in groups not larger than two or three
<b>Secondary Treatment</b>	
Peers	fulfilled Vote: unanimous Justification: UQU has provided additional documents verifying that the technical equipment on the female campus has been sufficiently increased.
TC 09	fulfilled Vote: unanimous Justification: The Technical Committee follows the auditors' assessment.
TC 10	fulfilled Vote: unanimous Justification: The Technical Committee follows the auditors' assessment.

- A 6. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

<b>Initial Treatment</b>	
Peers	not fulfilled Vote: unanimous Justification: The submitted Diploma Supplements lack in structure and academic level of the degree programmes as well as in a summary of the individual performance of the student.
TC 09	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers
TC 10	not fulfilled Vote: unanimous Justification: The TC follows the judgement of the peers

AC	not fulfilled Vote: unanimous Justification: The submitted Diploma Supplements lack in structure and content. The academic level of the degree programmes as well as the individual performance of the student are not described adequately
<b>Secondary Treatment</b>	
Peers	fulfilled Vote: unanimous Justification: The Diploma supplement has been updated and now includes all necessary information.
TC 09	fulfilled Vote: unanimous Justification: The Technical Committee follows the auditors' assessment.
TC 10	fulfilled Vote: unanimous Justification: The Technical Committee follows the auditors' assessment.

## Decision of the Accreditation Commission (28.06.2019)

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Biology	All requirements fulfilled*	-	30.09.2023
Ba Chemistry	All requirements fulfilled*	-	30.09.2023

\* The Accreditation Committee for Degree Programmes decides to include the following reference into the notifying letter to the HEI:

"UQU should develop uniform scientific standards for the scope and quality of the graduation project and make them available to both teachers and students, with the goal to establish graduation projects that are aligned with international standards for Bachelor's theses."

## Appendix: Programme Learning Outcomes and Curricula

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

Program Learning Outcomes	
<b>Knowledge</b>	1- To know the ethics of biology and related areas of science. 2- To design methods for analyzing and solving problems in the field of biology and its applications. 3- To think critically in evaluating biological information. 4- To implement projects related to his study in biology program.
<b>Cognitive Skills</b>	1- To understand the importance of scientific research and look at the recent advances in biological sciences. 2- To prepare, explore, identify, analyze and evaluate various scientific problems and solutions. 3- To compare and contrast the methods of scientific research and the ability to design and evaluation of scientific research.
<b>Interpersonal Skills &amp; Responsibility</b>	1- To involve working independently and with multi-disciplinary teams. 2- To cooperate in providing scientific and technical services in various fields for all sectors. 3- Bear responsibility in various situations.
<b>Communication, Information Technology, Numerical</b>	1- To use the computer to prepare written reports, evaluate scientific data and calculations. 2- To use the internet to conduct search for published articles and books.
<b>Psycho-motor</b>	1- To perform basic and advanced biological laboratory techniques. 2- To be able to operate laboratory instruments.

The following **curriculum** is presented:

<b>FIRST YEAR</b>			
<b>LEVEL 1</b>			
<b>Course No.</b>	<b>Course Name</b>	<b>Credits</b>	<b>Preq.</b>
4021101	<b>GENERAL CHEMISTRY</b>	<b>4</b>	-
601101	<b>ISLAMIC CULTURE 1</b>	<b>2</b>	-
7001401	<b>ENGLISH LANGUAGE</b>	<b>4</b>	-
4041101	<b>MATHEMATICS (CALCULUS)</b>	<b>4</b>	-
605101	<b>HOLY QURAN 1</b>	<b>2</b>	-
<b>Total credits</b>		<b>16</b>	

<b>LEVEL 2</b>			
<b>Course No.</b>	<b>Course Name</b>	<b>Credits</b>	<b>Preq.</b>
4011101	<b>GENERAL BIOLOGY</b>	<b>4</b>	
7001401	<b>ENGLISH FOR APPLIED SCIENCE</b>	<b>4</b>	7001401
4031101	<b>GENERAL PHYSICS</b>	<b>4</b>	
501101	<b>ARABIC LANGUAGE</b>	<b>2</b>	
102101	<b>BIOGRAPHY OF THE PROPHET MOHAMMAD</b>	<b>2</b>	-
<b>Total credits</b>		<b>16</b>	

<b>SECOND YEAR</b>			
<b>LEVEL 3</b>			
<b>Course No</b>	<b>Course Name</b>	<b>Credits</b>	<b>Preq.</b>
4022061	<b>BIOSTATISTICS</b>	<b>2</b>	
4012211	<b>PLANT KINGDOM</b>	<b>3</b>	4011101
4022301	<b>ORGANIC CHEMISTRY</b>	<b>4</b>	4021101
4012041	<b>GENERAL ANATOMY</b>	<b>3</b>	4011101
605201	<b>HOLY QURAN II</b>	<b>2</b>	605101
6012311	<b>INVERTEBRATES</b>	<b>3</b>	4011101
<b>Total credits</b>		<b>17</b>	

<b>LEVEL 4</b>			
<b>Course No</b>	<b>Course Name</b>	<b>Credits</b>	<b>Preq.</b>
4012232	<b>PLANT TAXONOMY</b>	<b>3</b>	4012211
4012242	<b>PLANT ECOLOGY</b>	<b>3</b>	4012211
4012322	<b>VERTEBRATES</b>	<b>3</b>	4912311
4012252	<b>PHYCOLOGY</b>	<b>3</b>	4011101
4012072	<b>BIOCHEMISTRY</b>	<b>3</b>	4022301
601201	<b>ISLAMIC CULTURE II</b>	<b>2</b>	601101
<b>Total credits</b>		<b>17</b>	

THIRD YEAR			
LEVEL 5			
Course No	Course Name	Credits	Preq.
4013331	ANIMAL PHYSIOLOGY I	3	4012171
4013261	PLANT PHYSIOLOGY I	3	4012171
4013281	GENETICS	3	4011101
4013291	FLORA OF SAUDI ARABIA	3	4012232
601301	ISLAMIC CULTURE III	3	601201
605301	HOLY QURAN III	2	605201
Total credits		17	

LEVEL 6			
Course No	Course Name	Credits	Preq.
4013352	ANIMAL ECOLOGY	3	4012322
4013362	ENTOMOLOGY	3	4012311
4013342	ANIMAL PHYSIOLOGY II	3	4013331
4013272	PLANT PHYSIOLOGY II	3	4013261
4013402	VIROLOGY AND BACTERIOLOGY	3	4011101
4013082	MOLECULAR BIOLOGY	3	4013281
Total credits		18	

FOURTH YEAR			
LEVEL 7			
Course No	Course Name	Credits	Preq.
4014311	PARASITOLOGY	3	4012311
4014321	FAUNA OF SAUDI ARABIA	3	4013352
4014331	PEST CONTROL	3	4013362
4014411	MYCOLOGY AND PLANT PATHOLOGY	2	4011101
4014091	ENVIRONMENTAL POLLUTION	2	4013352
605401	HOLY QURAN IV	2	605301
Total credits		15	

LEVEL 8			
Course No	Course Name	Credits	Preq.
4014342	ANIMAL BEHAVIOR	2	4014321
4014352	EMBRYOLOGY	3	4012322
4014212	TISSUE CULTURE	3	4013281
4014112	BIOTECHNOLOGY	3	4013182
4014362	ENDOCRINOLOGY	3	4013342
601401	ISLAMIC CULTURE IV	2	601301
Total credits		16	

FOURTH YEAR			
SUMMER			
Course No	Course Name	Credits	Preq.
4014923	FINAL YEAR PROJECT	5	

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Chemistry:

## **1.2 Learning outcomes of the program**

### **1.2.1 Knowledge (specialist competences)**

Bachelor's degrees programs ensure that students:

- Are fully conversant with major aspects of chemical terminology.
- Demonstrate a systematic understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical and practical problems.
- Gain knowledge of a range of inorganic and organic materials.
- Demonstrate, with supporting evidence, their understanding of synthesis, including related isolation, purification and characterization techniques.
- Demonstrate an understanding of the qualitative and quantitative aspects of chemical metrology.
- Develop an awareness of issues within chemistry that overlap with other related subjects.
- Develop knowledge and understanding of ethics, societal responsibilities, environmental impact and sustainability.

### **1.2.2 Cognitive skills**

Cognitive skills to be developed and level of performance expected, Bachelor's degrees programs ensure that students:

- Demonstrate the knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas covered in their program
- Apply the knowledge and understanding given to the solution of qualitative and quantitative problems that are mostly of a familiar nature
- Recognize and analyze problems and plan strategies for their solution
- Generate, evaluate, interpret and synthesis of chemical information and data
- Use computational methodology and models skills based on practical applications of theories.

### **Chemistry-related practical skills**

- Skills in the safe handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use and the ability to conduct risk assessments
- Skills in the operation of standard chemical instrumentation
- Ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.

#### **1.2.3 Interpersonal skills and responsibility**

- Skills in the employment of common conventions and standards in scientific writing, data presentation, and referencing literature
- Problem-solving skills, relating to qualitative and quantitative information
- Basic interpersonal skills, relating to the ability to interact with other people and to engage in team working.

#### **1.2.4 Communication, information technology and numerical skills**

- Communication skills, covering both written and oral communication with a variety of audiences for the scientific material and arguments
- Demonstrate communication written or presenting skills.
- Demonstrate skills in the usage of computer, network, and software packages relevant to chemistry; e.g. Chem-draw, Microsoft excel.
- Numeracy and mathematical skills, including handling data, algebra, functions, trigonometry, calculus, vectors and complex numbers, alongside error analysis, order-of-magnitude estimations, systematic use of scientific units and different types of data presentation.



The following **curriculum** is presented:

FIRST YEAR			
LEVEL 1			
Course No.	Course Name	Credits	Preq.
402101	GENERAL CHEMISTRY 1	5	-
601101	ISLAMIC CULTURE 1	2	-
401101	BOTANY	2	-
401102	ZOOLOGY	2	-
705101	ENGLISH LANGUAGE	2	-
404101	MATHEMATICS	4	-
605101	QURAN 1	2	-
Total credits		19	

LEVEL 2			
Course No.	Course Name	Credits	Preq
402112	VOLUMETRIC ANALYTICAL CHEMISTRY	3	402101
705102	ENGLISH LANGUAGE	3	705101
402121	GENERAL CHEMISTRY 2	2	402101
402131	ALIPHATIC ORGANIC CHEMISTRY	4	402101
403101	GENERAL PHYSICS 1	4	-
102101	PROPHETIC BIOGRAPHY	2	-
402113	QUALITATIVE ANALYTICAL CHEMISTRY	2	402101
Total credits		20	

SECOND YEAR			
LEVEL 3			
Course No	Course Name	Credits	Preq
402213	GRAVIMETERIC ANALYTICAL CHEMISTRY	2	402112
402221	CHEMISTRY OF MAIN GROUP ELEMENTS	2	402121
402234	AROMATIC ORGANIC CHEMISTRY	3	402131
402243	COLLOID CHEMISTRY AND PHASE RULE	2	402121
402235	QUANTUM CHEMISTRY	2	402121
402241	THERMODYNAMICS	3	402112
405123	COMPUTER SCIENCE	3	404101
501101	ARABIC LANGUAGE	2	
Total credits		19	

LEVEL 4			
Course No	Course Name	Credits	Preq
402214	ORGANIC ANALYTICAL CHEMISTRY	2	402112
402223	CHEMISTRY OF TRANSITION METALS	3	402221
605201	QURAN 2	2	605101
402235	PHYSICAL ORGANIC CHEMISTRY	3	402234
402242	KINETIC CHEMISTRY AND CATALYSIS	3	402241
402245	ELECTROCHEMISTRY	3	402112
402254	INTRODUCTION TO SPECTROSCOPY	2	402253
601201	ISLAMIC CULTURE 2	2	601101
Total credits		20	

THIRD YEAR			
LEVEL 5			
Course No	Course Name	Credits	Preq
402311	SPECTROPHOTOMETRIC AND ELECTROCHEMICAL TECHNIQUES	3	402112
402332	ORGANIC SPECTROSCOPY	3	402235
402333	CHEMISTRY OF HETEROCYCLIC COMPOUNDS	3	402234
402343	SURFACE CHEMISTRY	3	402243
601301	ISLAMIC CLUTURE 3	3	601201
605301	QURAN 3	2	605201
Total credits		17	

LEVEL 6			
Course No	Course Name	Credits	Preq
402317	SEPARATION METHODS AND THERMAL ANALYSIS	3	402311
402325	COORDINATION CHEMISTRY	3	402223
402336	ORGANIC REACTIONS AND PREPARATIONS	3	402332
402385	PETROLEUM CHEMISTRY AND PETROCHEMICALS	3	402333
601401	ISLAMIC CLUTURE 4	2	601301
605401	QURAN 4	2	605301
402335	CHEMISTRY OF NATURAL PRODUCTS	2	402333
Total credits		18	

FOURTH YEAR			
LEVEL 7			
Course No	Course Name	Credits	Preq
402426	ORGANOMETALLIC CHEMISTRY	2	402325
402427	MECHANISM OF REACTIONS AND SPECTROSCOPY	2	402325
402428	CHEMISTRY OF SOLID STATE	2	402325
402445	ADVANCED KINETIC CHEMISTRY	2	402343
402447	ADVANCED ELECTROCHEMISTRY	2	402245
402487	POLYMER CHEMISTRY	3	402336
402424	NUCLEAR CHEMISTRY	1	402223
Total credits		14	

LEVEL 8			
Course No	Course Name	Credits	Preq
402413	SELECTED TOPICS IN ANALYTICAL CHEMISTRY	2	402317
402429	SELECTED TOPICS IN INORGANIC CHEMISTRY	2	402325
402446	SOLUTION CHEMISTRY AND KINETIC THEORY OF GASES	2	402445
402433	SELECTED TOPICS IN ORGANIC CHEMISTRY	3	402336
402435	ADVANCED ORGANIC CHEMISTRY	3	402336
402495	RESEARCH PROJECT	2	402427
Total credits		14	