



**ASIIN Seal**

## **Accreditation Report**

**Bachelor's Degree Programmes**

***Biology***

***Chemistry***

***Mathematics***

***Physics***

Provided by

**Jazan University, Saudi Arabia**

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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>
الأحياء في العلوم بكالوريوس	Bachelor's programme in Biology	ASIIN	-	10
في العلوم بكالوريوس الكيمياء	Bachelor's programme in Chemistry	ASIIN	-	09
بكالوريوس علوم في الرياضيات	Bachelor's programme in Mathematics	ASIIN	-	12
بكالوريوس علوم في الفيزياء	Bachelor's programme in Physics	ASIIN	-	13
<b>Date of the contract:</b> 28.03.2022 <b>Submission of the final version of the self-assessment report:</b> 01.12.2022 <b>Date of the audit:</b> 17.01. – 19.01.2023				
<b>Peer panel:</b> Prof. Dr. Marc Brecht, University of Applied Sciences Reutlingen Dr. Regina Holzhauser, St. Ingbert Prof. Dr. Angelika Loidl-Stahlhofen, Westphalian University of Applied Sciences, Recklinghausen Prof. Dr. Gabriel Wittum, King Abdullah University of Science and Technology Jorge Amador Herrera, King Abdullah University of Science and Technology, student				
<b>Representative of the ASIIN headquarter:</b> Rainer Arnold				

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

<sup>2</sup> TC: Technical Committee for the following subject areas: TC 09 – Chemistry; TC 10 – Life Sciences; 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 29.03.2019 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019 Subject-Specific Criteria of Technical Committee 12 – Mathematics as of 09.12.2016 Subject-Specific Criteria of Technical Committee 13 – Physics as of 20.03.2020	

## B Characteristics of the Degree Programmes

a) Name	Final degree (original)	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's programme in Biology	Bachelor of Science in Biology	-	6	Full time	no	8 Semester	130 CH / 217 ECTS	Fall Semester, 2008
Bachelor's programme in Chemistry	Bachelor of Science in Chemistry	-	6	Full time	no	8 Semester	130 CH / 217 ECTS	Fall Semester, 2008
Bachelor's programme in Mathematics	Bachelor of Science in Mathematics	-	6	Full time	no	8 Semester	130 CH / 217 ECTS	Fall Semester, 2006
Bachelor's programme in Physics	Bachelor of Science in Physics	-	6	Full time	no	8 Semester	130 CH / 217 ECTS	Fall Semester, 2006

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

For the Bachelor's degree programme Biology, Jazan University has presented the following vision, mission, goals, and values in the Self-Assessment Report:

### **Biology Programme Vision**

Excellence, leadership, and innovation in education, scientific research and community service in biological sciences locally and regionally.

### **Biology Programme Mission**

Providing distinguished academic programs to qualify students, and innovative scientific research to contribute in the requirements of development and community service.

### **Biology Programme Goals**

1. Create an environment of quality education in biological sciences.
2. Offer students the opportunity to gain knowledge and skills needed to engage into various Biology professions in industry, scientific inquiry, and foster life-long learning.
3. Build a culture for research and strengthen relationship with the community.

### **Biology Programme Values**

- **Citizenship and Loyalty:** Cherishing national identity and sensing social responsibility and a sense of commitment and initiative towards the goals and objectives of the department.
- **Excellence:** We continually strive to be among the best in all we do in teaching, research, creative expression, service to our communities and service to each other in our daily interactions.
- **Diversity:** We seek to treat all individuals with dignity and fairness and to promote understanding and respect for a diversity of perspectives, traditions and experiences.
- **Social Responsibility:** We are committed to exploring the challenges that confront our region and country, by using our intellectual and creative capabilities to address these challenges, serve our communities, and have a positive and sustainable impact on development, business, the environment and society.
- **Capacity building:** Investing in Human Capital.
- **Integrity:** We believe that individuals are accountable for their actions, and as members of a community, our individual actions have an impact on others. We are stronger as a community when we reflect on the consequences of our decisions and

actions, and we uphold the principles of academic integrity, including fairness, accountability and honesty.

- Teamwork: Devoting the principle of cooperation and work in the spirit of one team.
- Lifelong Learning: We believe that the pursuit of knowledge, understanding and personal and professional development should continue throughout one's lifetime.

For the Bachelor's degree programme Chemistry, Jazan University has presented the following vision, mission, goals, and values in the Self-Assessment Report:

### **Chemistry Programme Vision**

The pursuit of excellence in education, scientific research and community services.

### **Chemistry Programme Mission**

Provide educational, research services and build effective partnerships to serve the community in chemistry

### **Chemistry Programme Goals**

1. Provide comprehensive and effective education based on facilities and services in the department.
2. Enhance the utilization of Information technology in the department.
3. Activate and completion the department annual plans.
4. Develop the capabilities and skills of human resources in the department.
5. Provide a high-quality academic program based on modern educational strategies.
6. Increase support and development of scientific research and innovation in the various fields of chemistry.
7. Activate and strengthening the educational, research and training partnerships in the department.
8. Develop the learning outcomes of the program and develop the skills of faculty members and students.
9. Improve the efficiency of the department's graduates.
10. Develop the department role in community service.

### **Chemistry Programme Values**

- Citizenship: Pride in national identity and sense of social responsibility.
- Affiliation: A sense of commitment and initiative towards the goals and objectives of the college.
- Responsibility: Adhere to ethical standards and work values.
- Excellence: the application of standard practices and the provision of quality services.
- Capacity building: investing in human capital.
- Teamwork: Devoting the principle of cooperation and teamwork.

For the Bachelor's degree programme Mathematics, Jazan University has presented the following vision, mission, goals, and values in the Self-Assessment Report:

### **Mathematics Programme Vision**

Excellence in different fields of Mathematical science to achieve competitiveness at the level of the Kingdom and the region through its research, teaching and community service

### **Mathematics Programme Mission**

To produce competent graduates in Mathematics and motivate for scientific research to enrich and serve the surrounding society in view of KSA vision-2030

### **Mathematics Programme Goals**

- 1 To use a variety of models and methods in order to define, represent and solve mathematical problems
- 2 To communicate mathematical reasoning symbolically, verbally and in writing
- 3 Use critical thinking and problem solving skills to analyze and assess the validity of mathematical information
- 4 Effectively use technology to communicate, collect, display and analyze information
- 5 To provide with the skills required to succeed in a mathematics work or related field
- 6 To perform effectively, individually or within group

### **Mathematics Programme Values**

Mathematical Attitude: Cultivate a fine mathematical taste

Affiliation: Assess the impact of Mathematics in sustainable development of society

Teamwork & Responsibility: Sense of self-awareness, teamwork, emotional intelligence, social and ethical responsibilities in practicing Mathematics and its applications



Excellence: Skills in managing knowledge and ability to solve variety of problems in sciences and technical specialty courses

Building competences: Relevant academic and scientific competencies

For the Bachelor's degree programme Physics, Jazan University has presented the following vision, mission, goals, and values in the Self-Assessment Report:

### **Physics Programme Vision**

Physics programme at Jazan University aspires to achieve excellence in physics education, scientific research and community service to become a leading Physics Programme locally and globally.

### **Physics Programme Mission**

Physics Programme provides high quality education, research and innovation in the field of physics to contribute to the development of a dynamic society.

### **Physics Programme Goals**

1. Provide distinct and high quality education and training for Bachelor of Physics.
2. Establish and maintain high-impact research infrastructure and environment in physics and related fields.
3. Provide outstanding community services that contribute to the development of society.

### **Physics Programme Values**

Citizenship: Cherishing national identity and sensing social responsibility

Loyalty: A sense of commitment and initiative towards the goals and objectives of the faculty.

Responsibility: Adherence to ethical standards and business values.

Excellence: Application of standard practices and provision of quality services

Capacity building: Investing in Human Capital

Teamwork: Devoting the principle of cooperation and work in the spirit of one team

## C Peer Report for the ASIIN Seal

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

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

**Evidence:**

- Self-Assessment Reports
- Study plans
- Module descriptions
- Webpage Jazan University: <https://www.jazanu.edu.sa/en>
- Webpage College of Science: <https://www.jazanu.edu.sa/en/colleges/sci>
- Webpage Department of Biology: <https://www.jazanu.edu.sa/en/colleges/sci/bio>
- Webpage Department of Chemistry: <https://www.jazanu.edu.sa/en/colleges/sci/chem>
- Webpage Department of Mathematics: <https://www.jazanu.edu.sa/en/colleges/sci/math-department>
- Webpage Department of Physics: <https://www.jazanu.edu.sa/en/colleges/sci/physics-department>
- Discussions during the audit

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

The peers base their assessment of the learning outcomes as provided on the websites and in the Self-Assessment Report of the four Bachelor's degree programmes under review.

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

The 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 programme Biology, as defined by Jazan University, correspond with the competences as outlined by the SSC. They come to the following conclusions:

Graduates of the Bachelor's degree programme Biology should understand the basic biological processes and be capable of applying the scientific methods of the biological sciences. In addition, graduates should acquire relevant scientific knowledge in the different biological areas such as botany, zoology, biotechnology, microbiology, molecular biology, cell biology, and related natural sciences (chemistry, physics). Furthermore, the students should be able to design, perform, and assess independent laboratory experiment and fieldwork in biology. Moreover, students should learn how to collect, analyse, and interpret data to solve biological issues. Finally, students should be qualified to conduct long-life learning and work effectively, both individually and in a team, and to demonstrate a scientific, critical, and innovative attitude in biology learnings, laboratory works, and environmental care.

The programme's educational objectives and learning outcomes are expected to equip the graduates with life skills required to develop and adapt to the wide spectrum of possible occupations in areas such as genetic engineering, biomedicine, biotechnology, and pharmacology. Biology graduates have various occupational opportunities, which include working as a researcher, teacher/lecturer, entrepreneur, and they can find suitable jobs in industry, academia, or public institutions.

The peers refer to the Subject-Specific Criteria (SSC) of the Technical Committee Chemistry, Pharmacy as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme Chemistry, as defined by Jazan University, correspond with the competences as outlined by the SSC. They come to the following conclusions:

Chemistry graduates should acquire a basic knowledge of natural sciences and gain methodological and scientific competences in the chemical sciences (analytical chemistry, organic chemistry, inorganic chemistry, physical chemistry, and biochemistry) in order to learn about the structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis, and characterization of chemicals. Furthermore, graduates should also be able to carry out practical work in laboratories and to design and perform experiments. They also should be familiar with modern experimental methods of chemistry, the safe handling of chemicals, have a sound knowledge of safety and environmental issues and the underlying legal framework, and be able to interpret, critically assess, present, and communicate relevant information and new research results, and to discuss them with specialist colleagues. Moreover, the graduates should be capable of using the acquired

knowledge and skills to find solutions to practical chemical problems and for conducting scientific work. Finally, they should be familiar with chemical hazards and problems that are relevant for the community and be able to apply appropriate means to solve these problems, in order to improve the quality of people's lives.

Graduates of the chemistry programme have several job opportunities. The majority of chemistry graduates work in sectors such as chemical and pharmaceutical industry, petrochemical and gas companies, mining and polymer industries, environmental research and monitoring institutions, public agencies, and educational institutions by becoming teachers or lecturers.

Graduates of the Bachelors' degree programme Mathematics should acquire a profound knowledge of mathematics and gain methodological competences in the mathematical sciences. Students should develop a mathematical, logical, and rigorous reasoning. In addition, they should be familiar with different fundamental areas of mathematics (like linear algebra, discrete mathematics, mathematical computation and simulation, multivariable calculus, data analysis, and differential equations). Finally, graduates should have a thorough understanding of the underlying mathematical concepts. This should enable them to develop critical thinking skills and the ability to use mathematical concepts to solve real life problems.

Mathematics graduates usually follow two distinct careers: some work in academia or higher education as math researchers or teachers, while others work in private companies. Job opportunities in the industry are manifold: some graduates have an interest in information technology and work as computer programmers, software developers, or data scientists. Others may take jobs in the financial sector and work as consultants or financial analysts. Some graduates pursue further degrees (Master or PhD) in mathematics or other scientific fields.

The intended learning outcomes of the Bachelor's degree programme Physics focus on conveying scientific methods for observing, understanding, analysing, and solving physical phenomena and problems. This includes that graduates should also acquire fundamental knowledge of mathematics, computer sciences, and natural sciences relevant to physics. Furthermore, graduates need to know how to conduct and prepare experiments, including the application of scientific methods. In addition, graduates should be capable to apply and evaluate modern methods and instruments of studying and teaching physics by using information and communication technology.

Physics graduates have numerous job opportunities, because they are not restricted to a specific area, but are prepared for a science and technology oriented job market. As a re-

sult, physics graduates work in various sectors such as universities, research institutes, public and private agencies, information & communication companies, or high schools. Some open their own private business and others work in areas such as banking, insurance, retail, or other services.

Supplementing the subject-related qualification objectives, students of all four Bachelor's programmes should have adequate competences in oral and written communication skills, be capable of working autonomously as well as in a group, and be able to conduct research activities. Furthermore, they should have trained their analytical and logical abilities and should acquire communicative and language skills as well as develop a strategy for life-long learning.

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

The peers conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the respective Technical Committees.

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

- Self-Assessment Reports
- Study plans

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

Jazan University awards a Bachelor of Science (B.Sc.) to the graduates of the four undergraduate programmes.

The peers confirm that the names of all four Bachelor's degree programmes appropriately reflect the focus and content of the respective programme. Moreover, the English translation and the original Arabian names of the programmes correspond with the intended aims and learning outcomes.

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

- Self-Assessment Reports
- Study plans
- Module descriptions
- Academic Handbooks
- Webpage Jazan University: <https://www.jazanu.edu.sa/en>
- Webpage College of Science: <https://www.jazanu.edu.sa/en/colleges/sci>
- Webpage Department of Biology: <https://www.jazanu.edu.sa/en/colleges/sci/bio>
- Webpage Department of Chemistry: <https://www.jazanu.edu.sa/en/colleges/sci/chem>
- Webpage Department of Mathematics: <https://www.jazanu.edu.sa/en/colleges/sci/math-department>
- Webpage Department of Physics: <https://www.jazanu.edu.sa/en/colleges/sci/physics-department>
- Discussions during the audit

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

All four undergraduate programmes are offered by the College of Science of Jazan University. Chemistry, Biology, Mathematics, and Physics are taught on the main campus in Jazan (male and female sections), as well as at the University College in Samtah for Chemistry and Physics, at the University College in Darb for Biology and Mathematics, at the University College in Al-Arda for Physics, and at the University College in Dair for Mathematics (female sections only). At the outlying campuses in Darb, Dair, Samtah, and Al-Arda only female students are taught, because in the past they could not travel to Jazan or another city to study there.

The Bachelor's degree programmes under review are designed for four years and are offered as full time programmes. In all four programmes, 130 credit hours (CH) need to be achieved by the students (this is equivalent to 217 ECTS points).

All undergraduate programmes at Jazan University are designed to be completed in eight semesters or four academic years. Each semester is equivalent to 15 weeks of learning activities. Besides these learning activities, there is one week for final exams.

A short summer semester is offered with a maximum workload of ten credit hours. The summer semester is designed to assist students to repeat failed classes or to make up for missing credits in order to be able to complete the programme in time.

In tailoring the curriculum, the department was guided by the academic accreditation requirements, the standards of the National Commission for Academic Accreditation and Assessment (NCAAA) and according to the national qualifications framework (NQF) for higher education in the Kingdom of Saudi Arabia.

The curriculum consists of university requirements and compulsory courses determined by the College of Science and the respective departments. University requirements are courses that need to be attended by all undergraduate students at Jazan University. The university requirements include courses such as “Islamic Culture” and “Arabic Language”. These courses are almost all offered in the first two semesters of studies, in addition to courses conveying basic knowledge of English and natural sciences (physics, mathematics, chemistry, biology, and computer sciences). Courses on the different subject-specific topics are offered from third to eighth semester.

The peers discuss with the programme coordinators why neither of the four degree programmes includes any electives. All courses are compulsory and thus, the students are not able to choose any courses to follow their individual interests. First, it would be very useful to offer electives and, secondly, to group the electives according to their scientific focus. This would help students to select suitable electives so that they have a better orientation and can develop their personal scientific profile. The programme coordinators confirm that, so far, no electives are offered, but a new guideline by the Saudi Government also allows the programmes to introduce electives, which the departments will do.

According to the university’s mission, the degree programmes aim at preparing students equally well for a scientific career and for work in industry or the public sector. This requires gaining expertise in carrying out independent scientific work, demonstrated, for instance, in a graduation project. Nevertheless, the Bachelor’s degree programme Mathematics does not include any graduation project. In addition, not all graduation projects reviewed by the auditors during the on-site-visit reflect an adequate scientific level (This is also discussed under criterion 3). According to the SSC of the Technical Committee Mathematics graduates of a Bachelor’s degree programme Mathematics should be able to solve mathematical problems, which is generally to be proven within the framework of a Bachelor's thesis. Moreover, graduates should “have a basic ability to work in a scientific way. They are in particular able to formulate mathematical hypotheses and have an understanding of how such hypotheses can be verified or falsified using mathematical methods.” The SSC of the Technical Committees Biology, Chemistry, and Physics include similar requirements. The theses inspected by the auditors on-site did not reflect this academic level and, therefore,

this requirement of the SSC is not fulfilled. In the Biology, Chemistry, and Physics programmes graduation projects are done by students, but the scope and scientific demand of the graduation project is rather low by international standards.

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

In general, the peers confirm that all four degree programmes under review impart a broad range of competencies so that graduates can find suitable jobs mostly as teachers and educators. The peers gain the impression that the graduates of all degree programmes under review are well prepared for entering the labour market and have very good perspectives of finding adequate jobs in Saudi Arabia.

#### **Criterion 1.4 Admission requirements**

##### **Evidence:**

- Self-Assessment Reports
- Academic Handbooks
- Webpage Jazan University: <https://www.jazanu.edu.sa/en>
- Webpage College of Science: <https://www.jazanu.edu.sa/en/colleges/sci>
- Discussions during the audit

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

Saudi Universities Act no. (M/8)/ 1414) (2685/23), rules the entry requirements for the Bachelor's degree. According to the KSA Universities Act, the board of the university decides the number of new students to be selected each year after hearing the opinion of the colleges.

Admission requirements for all degree programmes are based on three elements: the final grade of the high school degree, passing of general entrance test by the applicant (conducted by the National Center for Assessment in Higher Education), and passing a test specifically designed for applicants considering enrolling for degree programmes at the College of Science.



The results are combined and weighted against a minimum threshold percentage that is defined annually for each programme. Combined results above the minimum threshold grant access to the programme, results below threshold not.

As described in the Self-Assessment Reports, the applicants' qualifying score is calculated from the high school score (30 %), the General Skills Test (Qiyas, 30 %), and the Achievement Test (Tahsili, 40 %).

Based on the number of lecturers, the condition of the facilities and the infrastructure, the College of Science decides the number of new students every year, which is subsequently proposed to the university.

Every year, over 400 new students enrol in the biology and chemistry programmes. The data reflects the differences in enrolment between male and female students in each academic year. Female students prefer to study biology or chemistry when they do not attend medical colleges. The number of expected and enrolled biology and chemistry students is shown in the following tables:

Number of Students	Expected Students				Enrolled Students			
	2018	2019	2020	2021	2018	2019	2020	2021
Male	150	190	170	150	116	123	111	169
Female	220	220	220	150	254	201	145	170
Darb	150	170	170	150	124	137	126	58
<b>Total</b>	<b>520</b>	<b>580</b>	<b>560</b>	<b>450</b>	<b>494</b>	<b>461</b>	<b>382</b>	<b>397</b>

Table 1: Expected and Enrolled Biology Students, Source: SAR Jazan University

Number of Students	Expected Students				Enrolled Students			
	2018	2019	2020	2021	2018	2019	2020	2021
Male	100	100	100	100	31	28	58	58
Female	250	250	200	200	228	201	184	184
Samtah	250	300	300	250	220	280	304	250
<b>Total</b>	<b>600</b>	<b>650</b>	<b>600</b>	<b>550</b>	<b>479</b>	<b>509</b>	<b>546</b>	<b>492</b>

Table 2: Expected and Enrolled Chemistry Students, Source: SAR Jazan University

The number of new students in the mathematics and physics programmes is also very high. In mathematics between 300 and 400 new students enrol every year and in physics between 380 and 480 new students are admitted. The details are shown in the following tables:

Year	Expected intakes					Actual intakes				
	Main Campus		Darb	Dair	Total	Main Campus		Darb	Dair	Total
	Male	Female				Male	Female			
2016/2017	210	178	116	150	654	97	112	87	88	384
2017/2018	120	240	120	140	620	85	122	51	67	325
2018/2019	105	207	128	120	640	133	95	104	104	445
2019/2020	75	155	150	93	520	65	115	92	92	308
2020/2021	161	165	174	84	640	89	99	81	81	296

Table 3: Expected and Enrolled Mathematics Students, Source: SAR Jazan University

Year	Expected intakes					Actual intakes				
	Main Campus		Sam-tah	Al-Arda	Total	Main Campus		Sam-tah	Al-Arda	Total
	Male	Female				Male	Female			
2016/2017	210	178	116	150	654	42	163	78	102	385
2017/2018	120	240	120	140	620	46	242	64	114	466
2018/2019	105	207	128	200	640	14	201	64	205	484

<b>2019/20 20</b>	75	155	150	140	520	20	151	85	145	401
<b>2020/20 21</b>	161	165	174	140	640	64	165	86	118	433

Table 4: Expected and Enrolled Physics Students, Source: SAR Jazan University

All students receive financial support from the Saudi government, which gives each student 1100 SAR per month (equal to \$293.33 USD) to encourage them to study.

From their discussion with the students, the peers gain the impression that the admission system is very effective and only very motivated and high-performing candidates are admitted. The peers consider the highly selected and motivated students to be one of the strong points of the four undergraduate programmes under review.

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

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

The peers appreciate that Jazan University will update the study plans and introduce electives in all four degree programmes. Additionally, it is planned to group small courses (with 2 – 3 CH) into larger courses. The peers point out that they encourage Jazan University to further strengthen students' practical skills especially in molecular biology and chemistry.

The peers consider criterion 1 to be mostly fulfilled.

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

### **Criterion 2.1 Structure and modules**

#### **Evidence:**

- Self-Assessment Reports
- Study plans
- Module descriptions

- Webpage Ba Biology: <https://s1-biologi.fmipa.unesa.ac.id/>
- Webpage Ba Chemistry: <https://s1-kimia.fmipa.unesa.ac.id/>
- Webpage Ba Mathematics: <https://s1-matematika.fmipa.unesa.ac.id/>
- Webpage Ba Physics: <https://s1-fisika.fmipa.unesa.ac.id/>
- Discussions during the audit

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

The undergraduate students in the College of Science study four years spread over eight semesters and they earn a degree of Bachelor of Science after completing 130 credit hours (217 ECTS points). All four undergraduate programmes begin with general studies, which include, for example, Mathematics, Physics, Biology, Chemistry, Computer Science, English language, and Islamic culture. The curricula include theoretical courses, exercises, and laboratory work, which can be divided into university requirements, College of Science requirements, and the requirements of the respective department. University requirements are studied by all undergraduate students of Jazan University and encompass 15 credit hours. College requirements encompass 24 credit hours are studied by all undergraduate students at the College of Science in the first year in order to prepare students academically and providing them with basic competences in natural sciences, English language, and mathematics. First year students from the College of Science attend the first year courses together, but they decide on their major at the time of their admittance to the university. However, it is possible for them to switch to another major during the first year, but they have to apply for it in time.

Since Jazan University has the goal to become internationally more visible and wants to further internationalising its degree programmes, the peers discuss with the programme coordinators and students if any classes at the College of Science are taught in English. The programme coordinators explain that most modules are partly taught in English (students that feel not confident enough to use English can speak Arabic). English textbooks are used in almost all courses and some assignments and presentations are done in English. The peers appreciate that some courses are partly taught in English; however, they are convinced that it would be very useful to introduce more English elements in the courses and to encourage the students to actively speaking English. This would further improve the students' English proficiency and better prepare them for international programmes. Increasing the share of courses that are taught in English, will give the students better chances and more opportunities to join international programmes and to spend some time abroad during their studies.

The peers see that the various teaching laboratories are spacious and offer enough working

places for all students to conduct the experiments in groups of two or three students. However, the share of practical laboratory work in the Bachelor's degree programmes Chemistry and Biology is rather low by international standards and should be increased. Chemistry and biology students should get more hands-on experience in the laboratory. In addition, chemistry students should learn to synthesize compounds applying the most relevant synthesis techniques. Moreover, they should be able to purify (distillation, crystallization, chromatography techniques) and to characterize their own products and therefore to rely on refractometers, IR-spectrometers, and mass spectrometry (coupled with gas chromatography and/or HPLC). All work with hazardous chemicals should be done in fume hoods. Biology students should become more familiar with molecular biology. Concerning their practical education, they should learn how to use instruments like centrifuges, autoclaves, electrophoresis devices, PCR's. In addition, they should become familiar with modern practical methods such as immunoblotting, transformation, DNA-sequencing, genetic engineering, and fluorescence spectroscopy.

While analyzing the study plans of the four degree programmes under review, the peers observe that there are a lot of small courses (with two or three CH) that could be grouped in larger modules. For example, in the Bachelor's degree programmes Physics, there is a lack of systematics and a clear division into experimental and theoretical physics cannot really be seen. Modules should be set up that have an overarching meaning and cover general fields, such as experimental physics or theoretical physics. This would also make the entire curriculum much more manageable. A similar problem occurs with the other three programmes.

The peers point out that Jazan University should regularly adapt the curricula to technological advancements and current developments in the respective sciences (e.g., bioinformatics, genetic engineering, immunology, analytical and computational chemistry, green chemistry, sustainability, artificial intelligence, and data science), in order to prepare graduates even better for the requirements of the job market. They peers emphasise that it is important to not only focus on the classic aspects of natural sciences but to also offer courses that cover modern international trends in sciences.

The peers appreciate that the programmes coordinators are very open to their suggestions and explain that they have already plans to adjust the study plans by increasing the scope of the final project, introducing larger modules, offering electives and introducing specialisations. These changes are now possible as the Saudi government has issued a new guideline for universities that gives them more freedom to design the study programmes and to establish new interdisciplinary and multidisciplinary degree programmes not only at the College of Science but also between different colleges e.g. between the College of Science

and the College of Engineering in the area of material science. Due to these new possibilities, Jazan University and the College of Science will offer new majors within the next few years.

In summary, the peers gain the impression that the choice of modules and the structure of the curriculum – with the mentioned areas of improvement - ensures that the intended learning outcomes of the respective degree programme can be achieved.

#### *International Mobility*

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

Some cooperation agreement for sending Saudi students to attend summer schools abroad exist. For example with De Monfort University (GB) and Kookmin University (Korea). However, studying abroad for a limited period during the Bachelor's programmes is not a well-established option so far. Before the COVID pandemic the departments send several of the senior students went abroad to join international projects and summer courses (e.g. to Utah State University and to universities in Malaysia, Korea, and the UK). These efforts have been stopped for the last two years, but the plan is to re-establish the cooperations now. The programme coordinators concede that the College of Science is waiting for the international accreditation of the Bachelor's degree programmes before starting international co-operations. In addition, it would also be useful to organise international workshops and courses at Jazan University and to invite students from other countries to join. The peers are convinced that such an offer would appeal to many students, especially from Europe, and this might help to further promoting the internationalisation of the degree programmes.

The students confirm during the discussion with the peers that some opportunities for international academic mobility exist at Jazan University and there are rules for recognizing achievements acquired at other universities outside Jazan University. However, they also point out that they wish for more places for long- and short-term stays abroad. The number of available places in the existing programmes is still limited. Jazan University also receives international students, mostly from African countries but also a small number from Europe. However, the numbers of incoming students is very low.

Since the peers learn from students and graduates that many of them plan to apply for international Master's programmes, the College of Science should immediately start to initiate exchange programmes with international universities and provide scholarships for qualified students. The peers emphasize that it is very useful for students to spend some time abroad already during their Bachelor's studies to improve their English proficiency and to enhance their opportunities for being accepted in an international Master's programme. Furthermore, the College of Science should invite more visiting lecturers, initiate more international exchange programmes, offer places for summer courses, and provide more scholarships for graduate students. A good starting point to initiate international cooperations are the manifold personal international contacts of the faculty members.

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

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

<b>Criterion 2.2 Work load and credits</b>
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**Evidence:**

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

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

All four Bachelor's programmes under review apply a credit point system. The credit hours (CH) are awarded on the basis of passing a course in the final examination. Students studying in the Bachelor's degree programme earn an average of 33 credit hours per academic year. According to the Self-Assessment Reports, one Saudi Arabian credit hour is awarded for one 50-minute lecture or two or three 50-minute laboratory or tutorial sessions over the 15-week long semester.

The students' academic load refers to the total credit hours for the courses the student must register for in each semester. The work load for each student is determined by JU regulations; the minimum academic load is 12 credit hours and the maximum academic

load is 20 credit hours per semester. The optional summer semester has a maximum academic load of 10 credit hours. The students' maximum academic load is determined by the students' GPA (The higher the GPA, the more credits students can take.). Based on the previous semester's studies, students can consider the maximum workload for the next semester based on their results. Students' study plans for each semester must have the approval of an academic advisor. The normal burden of student learning is 18 - 20 credit hours per semester.

The total workload of the four years Bachelor's programme is 5724 working hours, which is consistent with the requirement for a B.Sc. degree by the Saudi Arab Qualifications Framework (SAQF). According to this, the equivalent ECTS points to the 130 credit hours (CH) system is 217 (3 CH = 5 ECTS equivalent to 1 ECTS = 1.67 CH).

The peers perceive that the underlying credit hour system used for assigning credit points makes use of a fixed amount of contact hours and hours required for self-studies. This results in a conversion rate of about 1 to 1.67 between CH and ECTS credits. However, the semester workload indicates the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study, and examinations) and these need to be ascribed separately to each component of the curriculum.

The peers point out that the College of Science should follow the ECTS Users' Guide to determine the students' total workload. As described in the ECTS Users' Guide, the estimation of students' workload should include all learning activities. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study and examinations).

In other words, a seminar and a lecture may require the same number of contact hours, but one may require significantly greater workload than the other because of differing amounts of independent preparation by students. Typically, the estimated workload will result from the sum of:

- the contact hours for the educational component (number of contact hours per week x number of weeks)
- the time spent in individual or group work required to complete the educational component successfully (i.e. preparation beforehand and finalising of notes after attendance at a lecture, seminar or laboratory work; collection and selection of relevant material; required revision, study of that material; writing of papers/projects/dissertation; practical work, e.g. in a laboratory)
- the time required to prepare for and undergo the assessment procedure (e.g. exams)



Since workload is an estimation of the average time spent by students to achieve the expected learning outcomes, the actual time spent by an individual student may differ from this estimate. Individual students differ: some progress more quickly, while others progress more slowly. Therefore, the workload estimate should be based on the time an “average student” spends on self-studies and preparation for classes and exams. The initial estimation should then be verified via students’ questionnaires.

Since the workload of the students was only estimated by the programme coordinators and seems to be too low in comparison to the actual time needed by the students, the peers suggest re-evaluating the calculation of ECTS and engaging the students in verifying the weight of each module. This could e.g. be done by including a respective question in the course questionnaires. For this reason, it would be useful to include a respective question in the course questionnaires that are used for evaluating the quality of teaching and learning at the end of each semester. In any case, Jazan University must make sure that the actual workload of the students and the awarded ECTS points correspond with each other. This is especially necessary for the final project, where students spent a lot of their time in the lab or on self-studies. In addition, it needs to be defined and made transparent, how many hours of students’ total workload are required for one ECTS point.

In general, the degree programmes under review are designed to be completed within four academic years. Data summarizing the number of admitted students, dropout rates, and the number of graduations suggest that the degree programmes can be completed within the regular timeframe. Students as well as programme coordinators confirm during the discussions with the auditors that some students leave Jazan University after one or two semesters because they change their major because other degree programmes better fit their interests and qualifications. In addition, several female students decide to raise a family and leave the university. In total, the drop-out rates and the average length of studies are adequate.

In summary, the peers confirm that all four undergraduate programmes have a high but manageable workload.

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

- Self-Assessment Reports
- Study plans
- Module descriptions

- Discussions during the audit

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

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

The most common method of learning is class session, with several courses having integrated laboratory practices. Lecturers generally prepare presentations to aid the teaching process. With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods. The mandatory attendance for students is at least 75 % for each course in the respective programme.

During the Covid-19 Pandemic, the learning and teaching activities were converted from direct to online study to avoid infection with the virus and its spread among students. The lectures were preformed through the digital platform "Blackboard", which was also used for demonstrating practical work.

In summary, the peer group considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. However, practical sessions should be enlarged, especially in higher levels courses. During their final project, students should be encouraged to engage in creating own experimental setups and scientific discussion. In addition, they should learn critical reasoning about their lab results.

In summary, the peers confirm that the study concept of all four undergraduate programmes comprises a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

<b>Criterion 2.4 Support and assistance</b>
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#### **Evidence:**

- Self-Assessment Reports
- Academic Handbooks

- Discussions during the audit

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

Jazan University offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, every student is assigned to an academic advisor. Each academic advisor is a member of the academic staff and is responsible for approximately 5 to 10 students from her/his classes. He/she is a student's first port of call for advice or support on academic or personal matters.

The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. The students confirm during the discussion with the peers that they all have an academic advisor whom they can approach if guidance is needed.

Involved in support and assistance are furthermore programme coordinators as well as all members of the teaching staff. The teaching staff offers office hours for meeting students. The Dean for Student Affairs has overall responsibility for student guidance, problem solving, and academic / non-academic counselling. Sufficient resources for an effective support and assistance system exist and are appreciated and accepted by the students.

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

Jazan University has the digital platform "Blackboard", where teaching staff can manage complete online teaching processes irrespective of on-campus or distance learning courses. The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, course list) are available via "Blackboard". The different online tools are used to supplement the lectures, for example by providing learning materials, for giving homework, for offering additional advice to students, or for conducting group discussions.

The peers point out that it would be useful to establish eduroam at Jazan University. Education Roaming (eduroam) is an international initiative that provides staff members and students of participating universities and institutions with free internet access at the sites of all participating organisations. This is very helpful because this way, students, researchers and staff can easily obtain internet connectivity at all participating institutions. In addition, the peers suggest that it would be useful to increase the Linux capabilities of the computer labs.

The departments offer an orientation programme for new students at the beginning of the first semester in order to explain the study plans and all the procedures and regulations. For advanced students, career advice is offered in order to better prepare them for entering the labour market and informing them about different job opportunities.

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

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

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

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

The peers confirm that Jazan University has verified the students' total workload and the respective calculation of ECTS points. The estimation of students' workload now encompasses all learning activities, including preparation for lectures, practical work, quizzes, midterm exams, projects, activities, homework, final examinations, and practical examinations. The estimation is carried out through student questionnaires and the opinions of the course coordinators. The recalculated ECTS points have been included in the study plans, program specifications, programme handbooks, and curricula manuals, which can be accessed through the programmes' websites. However, the peers point out that Jazan University still has to define in an official regulation, how many hours of students' workload are required for one ECTS point.

The peers consider 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 Reports
- Module descriptions
- Academic Handbooks

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

As stated in the Self-Assessment Reports, there is a period in every semester for midterm exams and a period for final exams. Students' performance is not only evaluated based on the final examination but assignments, quizzes, laboratory work, homework, mid-term exams, and seminar work may also contribute to the final grade of a course. Examinations are typically written exams, such as essays, problem-solving or case-based questions, and calculation problems. The form of the exams for every module is specified in the associated module description (course specification). Examinations are scheduled according to JU's academic calendar. On a scale of 0 to 100, 60 points are required to pass a course. Students are able to view their final grades online by logging into "Blackboard".

To sit in the final exam Jazan University requires 75% attendance of the total number of lectures, labs, and tutorials. Students failing to meet this requirement in any of the courses are prohibited from attending the final examination of that course and earn a DN (Denied) grade in that course. A student who is absent in the final examination of a course for a valid reason accepted by the department council and the Dean of the Faculty is allowed to re-take the examination at a later date. If students fail a course, they have to re-take the whole course in the next semester.

According to the regulations of Jazan University, all students are required to maintain a grade point average (GPA) of at least 2.0 out of 5.0. A student failing to maintain the GPA of 2.0 will be placed on "academic probation" and is given two semesters to improve her/his GPA. At the beginning of each term, the Deanship of Admission and Registration provides each student with his full academic advising record showing the results of all the courses. Students get a warning if the GPA is below 2.0 out of 5.0 in a semester. Students are suspended if they get a maximum of three such consecutive warnings. Students are also suspended if they are not able to complete the graduation requirements within 16 semesters.

As stated in the Academic Handbooks, students' performance is usually assessed by assignments/quizzes (10 %), first mid-term exam (20 %), second mid-term exam (20 %), and final exam (50 %). Assignments include all laboratory reports, presentations, and quizzes that students should complete within a semester. Each course has a total of 100 points. Out of this, the instructor may allocate a maximum of 50 % to the semester work consisting of quizzes, homework, practical laboratory work, mid-term or other periodic assessments, while the remaining 50 % are allocated to the final examination. A detailed description of all required exams and their contribution to the final grade is included in each module description.

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

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

Some written examinations, however, leave the impression behind that students seem to succeed in learning by heart and are merely reproducing this knowledge. This approach, in combination with prevalence of written assessments, and the fact that almost none of the exams is oral, casts doubts whether the selection of methods adequately prepares students for future careers in research-oriented professions. In order to better meet international scientific standards and to ensure that the intended learning outcomes of the courses are met, the auditors recommend implementing more competence-oriented examination methods, for example oral examinations and presentations, which also foster the students' critical thinking.

With respect to the exams in the mathematics courses, the peers point out that it is important to improve the written exams in terms of structure. There were almost no proofs

and just some quick computations were required in the exams; they consisted mostly in giving examples, true/false, and multiple-choice questions. This was the case even in advanced courses like topology, where one would expect a test consisting only of proof-related tasks.

From studying the Self-Assessment Report and from discussions during the visit, the auditors gain the impression that the methods used by the teaching staff at the College of Science for assessing learning outcomes are generally appropriate. The only weak point they identify is the Final Project. During the audit, the peers inspect sample exams and final theses (final projects). Not all theses shown to the auditors correspond to scientific standards, as would have been expected based on the project description. The auditors consider scientific working standards, ethics in science, and concepts of writing scientific publications essential for graduating from scientific study programmes. Currently, the final project is usually literature based, but from the auditors' point of view, practical work or experiments should be an essential part of each thesis.

In case students work as a group when preparing a final project, the individual contribution of every student has to be apparent and clearly stated in the thesis in order to allow the individual contributions to be assessed. A reasonable limit for group size for conducting a graduation project are four students.

In order to meet international standards the auditors expect the College of Science to reconsider the scope, experimental background and documentation of the final project. Setting international standards will be the key for students to continue their academic education, particularly abroad, and will support graduates in finding a science-related job in the private sector or at universities.

In addition, the auditors point out that there is no final project in the current curriculum of the Bachelor's degree programme Mathematics. The auditors expect the College of Science to introduce a research project into the curriculum of the Bachelor's degree programme Mathematics.

If students fail a course, they usually have to repeat the entire course in the following semester or in the short summer semester; it is usually not possible to retake just parts of the courses or to just retake the final exam. However, lecturers need to arrange examinations for students who have not taken the examinations due to valid reasons (e.g., illness).

As the students explain during the audit, they need to consult with their academic advisor on how to improve their performance if they fail a course. Approximately 10 % of the students at the College of Science need to retake courses due to failed final exams. Some students are also advised to change their major and to transfer to another college, because

their academic performance is below the requirements and the teachers do not expect them to be able to finish the degree programme at the College of Science successfully.

The students confirm during the discussion with the peers that all rules and regulations regarding exams, calculation of grades and pass rates as well as scheduling and re-sits are clear to them and are transparently described.

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

The peers appreciate that the Mathematics programme will introduce a compulsory final project. They expect Jazan University to verify and substantiate this plan in the further course of the procedure. In addition, all four Bachelor's programmes will broaden the scope of the final project, which will be worth 4- 5 CH and will be distributed over the last two semesters. This approach should enable students to carry out scientific project based on practical work as an essential component of the graduation thesis, which should be based on internationally recognised scientific standards and ethics. Nevertheless, the peers expect Jazan University to provide sample of current theses in the further course of the procedure.

The peers consider criterion 3 to be mostly fulfilled.

## 4. Resources

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

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

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

At Jazan University, the staff members have different academic positions. There are full professors, associate professors, assistant professors, lecturers and teaching assistants/demonstrators. The academic position of every staff member is based on research activities,



publications, academic education, supervision of students, and other supporting activities. For example, a full professor needs to hold a PhD degree. In addition, responsibilities and tasks of a staff member with respect to teaching load, research, and supervision depend on the academic position. The number of academic staff members in each department is determined by the number of degree programmes, the teaching load, and the number of admitted students.

According to the Self-Assessment Report, the Department of Biology currently employs a total of 112 staff members (14 full professors, 18 associate professors, 41 assistant professors, 33 lecturers, and 6 teaching assistants). The staff members are divided into the three specialties zoology, microbiology, and botany. The Department of Biology organises a seminar series throughout the academic year. This research seminar allows the staff members to present their research activities. The composition of the teaching staff at the Department of Biology according to their academic position is shown in the following table:

	Saudi		Non-Saudi		Total
	Male	Female	Male	Female	
Full Professor	0	0	11	3	14
Associate Professor	3	1	11	3	18
Assistant Professor	2	2	22	15	41
Lecturer	4	4	10	15	33
Teaching Assistant	0	6	0	0	6
Total	9	13	54	36	112

Table 5: Teaching Staff at the Department of Biology, Source: SAR Jazan University

The teaching staff of the Department of Chemistry currently encompasses 97 faculty members. With respect to their academic position, the teaching staff consists of 6 full professors, 14 associate professors, 35 assistant professors, 31 lecturers, and 11 teaching assistants. The number and academic position of the teachers at the Department of Chemistry for the last three years is shown in the following table:

Year	2018-2019				2019-2020				2020-2021			
rank	Male	Female	Samtuh	Total	Male	Female	Samtuh	Total	Male	Female	Samtuh	Total
Prof.	4	2	0	6	4	2	0	6	4	2	0	6
Associate Prof.	8	4	0	12	9	4	1	14	9	4	1	14
Assistant Prof.	11	13	6	30	12	15	5	32	14	15	6	35
Lecturer	6	18	5	29	7	19	5	31	8	18	5	31
Teaching Assistant	0	1	1	2	1	3	3	7	3	5	3	11
Total	29	36	12	77	33	43	11	87	38	44	15	97

Table 6: Teaching Staff at the Department of Chemistry, Source: SAR Jazan University

At the Department of Mathematics, there are currently 112 academic staff members in all branches at various positions, which includes 90 teachers at male and female campuses (main campus) in Jazan, 12 members at Dair campus and 10 members at Darb campus. The faculty members are specialized in various mathematical areas, namely Analysis, Algebra, Geometry, Topology, Numerical Analysis, Discrete Mathematics, and different areas of Applied Mathematics. Apart from teaching duties, the faculty members are actively involved in research in different areas of mathematics and their research papers are published in international journals. In addition, the Department of Mathematics teaches mathematics courses required by other programmes of the University such as physics, chemistry, biology, computer science, and engineering. The composition of the teaching staff at the Department of Mathematics according to their academic position is shown in the following table:

Faculty	Professor	Associate Professor	Assistant Professor	Lecturer	Teaching Assistant	Total
Male	2	9	31	13	3	58
Female	1	3	14	26	10	54
Total	3	12	45	39	13	112

Table 7: Teaching Staff at the Department of Mathematics, Source: SAR Jazan University

Within the Department of Physics, there are currently 74 academic staff members (4 full professors, 11 associate professors, 28 assistant professors, 22 lecturers, and 9 teaching assistants). Some of them are Saudi citizens, but the overwhelming majority hold passports from other countries, including Germany, Canada, Turkey, Ethiopia, Indonesia, Egypt, Jordan, Algeria, Tunisia, Morocco, and Yemen. Areas of research include molecules physics, condensed matter physics, nuclear and particle physics, and theoretical physics. In addition, considerable efforts were made in the previous years to acquire research grants from Jazan University Research Deanship for various fields of physics. Many research projects are funded by the King Abdulaziz City for Science and Technology (KACST).

The Department of Physics is also responsible for offering physics courses in other degree programmes such as biology, chemistry, engineering and medicine. The composition of the teaching staff at the Department of Physics according to their academic position is shown in the following table:

Faculty	Professor	Associate Professor	Assistant Professor	Lecturer	Teaching Assistant	Total
Male	4	10	18	9	4	45
Female	0	1	10	13	5	29
Total	4	11	28	22	9	74

Table 8: Teaching Staff at the Department of Physics, Source: SAR Jazan University

In order to strengthen the sharing of scientific knowledge within the department, researchers from the Department of Physics as well as from abroad and other Saudi universities are invited to give a guest lecture. Every week (or occasionally more/less frequently), a member of the department, or more often a visiting researcher, is invited to give an hour-long lecture about their research activities.

The auditors discuss with JU's management about the university's policies and strategies for hiring new staff members. Accordingly, the Dean of the College of Science is asked to submit an annual strategic plan summarizing vacant positions and the need for hiring a specific expert in a field of research and teaching. The report takes the current situation and future planning into account. Vacancies and job specifications are announced on JU's webpage. Applicants from the Kingdom of Saudi-Arabia are hired primarily, applicants from abroad hereafter. The employment contracts of the faculty members range from 1-year contracts (non-Saudis) to permanent positions (assistant professors, associate professors and full professor with Saudi citizenship). Several of the staff members are from Saudi Arabia and hold permanent positions; employment contracts for the non-Saudi-Arabian teachers are limited to one year and need to be renewed annually. All vacancies at Jazan University are announced publicly; most of the teachers are hired as teaching assistants, but in addition some international teachers are directly hired as assistant or associate professors if there are specific needs in the departments. The peers especially appreciate the fact that most of the staff members have acquired their PhD abroad, e.g. in USA, UK, or Germany. This background allows the teachers to continue to work together in research projects with colleagues from their former universities.

For full professors, the maximum teaching load in a semester is 10 contact hours per week. The department may reduce the course load of a member who is assigned a special duty by the department, the college, or the university. Faculty members are expected to be available up to 40 hours per week for professional duties. For academic staff members, the

regular teaching load is 10 hours (full professor) 12 hours (associate professor) 14 hours (assistant professor) per week. The teachers confirm that the teaching load is mostly adequate and leaves enough room for conducting research activities and fulfilling their administrative tasks. However, the teachers from the Department of Mathematics point out during the audit, that their teaching load is quite high with approximately around 15 to 16 hours per week. This is high, especially in comparison with the other departments at the College of Science. For this reason, the College of Science should verify the teachers' teaching load at the Department of Mathematics and ensure that it does not exceed the maximum load so that teachers have enough time for their other tasks.

In summary, the peers 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 Reports
- Staff Handbooks
- Discussions during the audit

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

JU encourages training of its academic and technical staff for improving their abilities and teaching methods. As described in the Self-Assessment Reports, the Deanship of Academic Development (DAD) of Jazan University arranges regular workshops and activities for staff development. The list of staff development activities and training courses is accessible through the Deanship of Academic Development's website. In addition, the departments organise faculty development workshops, which include general orientations and awareness for new tools and equipment. For example, in recent times, there was a number of workshops to obtain maximum outcomes from "Blackboard" (for distance learning tools).

The departments also encourage the faculty members to conduct research activities and to participate in national and international conferences and workshops, which keeps them up to date with the recent developments in various fields of sciences. In addition, young staff members with a Master's degree are supported to pursue doctoral studies (usually abroad). To this end, JU has a scholarship programme that sends teaching assistants and lecturers to reputed universities to get a Master's or PhD degree.

During the audit, the peers inquire if the teaching staff has the opportunity to spend time abroad and to participate in international projects. They learn that Jazan University provides funds for joining international conferences. The funding covers conference and publication fees, and expenses for accommodation and traveling. The peers appreciate these extensive and well-supported options.

The peers 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 Jazan University, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops, or seminars; even a sabbatical leave is possible.

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

In summary, the peers confirm that Jazan University offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further developing their professional and teaching skills.

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

##### **Evidence:**

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

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

The peers discuss with representatives of JU's management funding issues and available financial resources for the College of Science and the departments. They learn that the Saudi government provides most funding for teaching and equipment. The Ministry of Education is responsible for the majority of the funding, which is used to fund all teaching and research activities, such as the purchase of basic and technological equipment, research projects, conferences, workshops, seminars, and scientific publications. The university's budget is provided by the Saudi government, in addition, there are some cooperations with companies, but this is limited because there is not much industry in the area of Jazan

Further funding can be applied for at the King Abdulaziz City for Science and Technology (KACST), an independent scientific organisation that is the national science agency of Saudi Arabia under the regime of the Saudi Arabian Prime Minister. KACST is primarily in charge of proposing, developing and implementing strategies for the advancement of science and technology concerning national and international affairs.

Every academic year the teaching staff at the respective departments submit a list of research projects for financial support and purchasing expensive technical equipment to the College of Science. The Dean of Scientific Research is responsible for managing financial and technical affairs related to scientific research in accordance with JU's annual research plan and the approved annual budget for research.

The provided budget allows the departments to conduct the study programmes as well as some specific activities, including research activities and participation in international conferences. In addition, JU provides dormitories, bookstore, cafeteria, hostels, playgrounds, a hospital and several facilities for cultural, sports and other extracurricular activities to achieve a positive balance between academic and extracurricular activities. This includes for example a stadium (volleyball, basketball, and handball).

Students and teachers have access to three different libraries. First, there is the library in the College of Science, second the Central Library of the University, and third the Saudi Digital Library. The Central Library offers a number of periodicals, magazines, databases, and electronic books, which can also be accessed via VPN. This include the dissertation and thesis index, journals search engine, catalogues, and search engines of different international libraries. The Saudi Digital Library (SDL) is an integrated digital library managed by the Ministry of Higher Education of Saudi Arabia. The SDL is the largest academic cluster of updated information sources in the Arab world, with more than (310,000) scientific sources that covers all academic areas. The SDL has contracts with more than 300 global publishers.

Every year, the Deanship of Student Affairs requests that the Colleges present a list of new textbooks in the fields of study of the academic programs offered by the Colleges to the Deanship. The new books edited by the College are available for purchase at JU's Central Library. During the audit, the students express their satisfaction with the library and the available literature there. There is sufficient access to international publications and scientific literature and students can remotely access international scientific databases.

From visiting the laboratories and classrooms (female and male campuses), the peers gain the impression that infrastructure is adequate for education according to the aims of the degree programmes under review. Classrooms are well equipped for teaching the students on a Bachelor's level is available and the spacious teaching labs offer enough workplaces.

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

However, the peers see that there is some room for improvement. For example, chemistry and biology students should get more hands-on experience in the laboratory.

Chemistry students should learn to synthesize and purify organic compounds covering the important substance classes. They should be trained in distillation, crystallization and chromatography techniques. Chemical cooking has to be done in fume hoods, which means that number of fume hoods have to be increased in organic chemistry labs. Every student should be able to characterize compounds by spectroscopic techniques (at least with UV-Vis, IR, and refractometer).

Biology students should be better trained in the fields of cellular and molecular biology. They should learn how to use instruments like centrifuges, autoclaves, electrophoresis devices, PCR's. In addition, they should become familiar with modern practical methods such as immunoblotting DNA-sequencing, genetic engineering, and fluorescence spectroscopy. In addition, eukaryotic cell culture would be a paying investment. Last but not least, intensive scientific cooperations with the new medical centre/hospital can foster important biochemical and biomedical research.

The College of Science should equip the laboratories accordingly and make sure that all instruments and technical devices are in good repair. Currently, there is a lot of technical equipment "under maintenance" and thus not available to the students and teachers. The Department of Mathematics should regularly update the hardware in the labs and should receive more funds to provide more mathematics and science programme packages for the computer labs. This goes hand-to-hand to having a final project in the mathematics program. It is necessary to give the students the proper resources and training (in both hardware and software, as well as theoretical skills) if they are going to write a thesis that is up to the international standards.

The most serious issue at the College of Science with respect to resources is the limited research capability in the Department of Physics. The peers observe that the only physics research lab is currently "under maintenance" and cannot be used for conducting research activities. The programme coordinators are aware of this problem and confirm that the

teachers have to rely on their international partners for doing research. From the peers' point of view, this is not sufficient and they expect the College of Science to reopen the existing physics research lab and to establish additional facilities, so that all teachers can conduct their research activities at the Department of Physics. This is also necessary to give students the opportunity to write their theses based on self-measured experimental data. In addition, they point out that additional instruments such as a DC sputtering system, an ion sputtering system, and an X-ray Diffraction (XRD) system as well as devices for analysing thermoluminescence and photo luminescence would be very useful to enhance the research capabilities in the Department of Physics

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

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

The peers appreciate that the Department of Mathematics plans to upgrade the software and hardware facilities in its labs. However, they encourage Jazan University to put a strong focus on improving the technical equipment of the laboratories in order to better promote practical education and research activities.

The peers thank Jazan University for explaining that the regular teaching load for lecturers is 16 credit hours per week. However, the peers suggest that the Department of Mathematics should verify the teachers' workload in order to make sure that they have enough time for their other tasks, especially for conducting research activities

The peers consider criterion 4 to be mostly fulfilled.

## **5. Transparency and documentation**

### **Criterion 5.1 Module descriptions**

#### **Evidence:**

- Self-Assessment Reports
- Module descriptions
- Webpage Department of Biology: <https://www.jazanu.edu.sa/en/colleges/sci/bio>



- Webpage Department of Chemistry: <https://www.jazanu.edu.sa/en/colleges/sci/chem>
- Webpage Department of Mathematics: <https://www.jazanu.edu.sa/en/colleges/sci/math-department>
- Webpage Department of Physics: <https://www.jazanu.edu.sa/en/colleges/sci/physics-department>

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

Jazan University provides module descriptions that include all necessary information about teaching methods, intended learning outcomes, content, admission and examination requirements, forms of assessment, details explaining how the final mark is calculated, and biographical references.

However, while analysing the module handbooks, the peers see that the module descriptions do not include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies). For this reason, the peers expect Jazan University to update the module descriptions and include all required information.

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

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

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

The peers understand that the students of the degree programmes under review receive a Diploma Certificate and a Transcript of Records. Unfortunately, no sample Diploma Supplements were provided. The peers point out that the graduates of all four degree programmes need to receive a Diploma Supplement upon graduation. The Diploma Supplement should follow the internationally recognised European template and 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 auditors expect that all graduates of the degree programmes are provided with a standardised Diploma Supplement. This makes academic qualifications comparable and raises the chances for succeeding on the job marked or for applying for further studies abroad.

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

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

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

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

The peers confirm that the rights and duties of both JU and the students are clearly defined and binding. However, the peers point out that the English homepages of all four degree programmes need to be updated in order to include all necessary information about the respective programme (study plan, learning outcomes, module descriptions, and link to academic guidelines).

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

The peers thank Jazan University for submitting sample Diploma Supplements for all four Bachelor's programmes. These documents will be handed out to all graduates. For this reason, the peers refrain from issuing a requirement to this respect.

As mentioned before (criterion 2), Jazan University has recalculated the students' total workload and the awarded ECTS points. This information also needs to be included in all module descriptions.

The peers confirm that Jazan University has updated the English homepages of all four degree programmes. They now include all necessary information regarding the respective program, such as the study plan, learning outcomes, module descriptions, and links to academic guidelines. The peers are satisfied with the updated webpages.

The peers consider criterion 5 to be mostly fulfilled.

## 6. Quality management: quality assessment and development

### **Evidence:**

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

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

The peers discuss the quality management system at Jazan University with the programme coordinators and the students. They learn that there is a continuous process in order to improve the quality of the degree programmes and it is carried out through internal (IQA) and external quality assessment (EQA).

The IQA process involves units at three management levels, i.e., university level, college level and department level. The quality assurance system at university level is coordinated by the Deanship of Academic Development and Quality Assurance with the goal of enhancing the academic performance at Jazan University. The Deanship is responsible for implementing the QA processes on university level and for the continuous improvement of the degree programmes through monitoring, assessing, and analysing the processes. To this end, the Deanship prepares the guidelines and quality standards for all degree programmes

All four departments (biology, chemistry, mathematics, and physics) are a part of the College of Science. The head of the college is the Dean, who also acts as the chair of the College Council. The Dean manages the college and is responsible for the results; the College Council makes decisions regarding the curricula of the degree programmes. The College Council is responsible for supervising the quality of teaching and decides the study plans and the degree requirements. In addition, the Council makes the proposal to the Rector concerning the entry requirements and the number of new entrants accepted to the degree programmes.

At the College of Science, the quality assurance processes fall under the responsibility of the quality unit, which is appointed by the Dean of the College. The unit is responsible for further developing the quality of teaching and learning processes of the degree programmes within the College of Science. The unit has representatives from each degree programme. In addition, each department has a committee for quality assurance; the head of this committee represents the department in the quality unit of the college. In addition, there is a Department Council in each department, which is chaired by the Head of Department. Its role is to ensure the quality of all processes and research activities in the depart-

ment and to implement academic standards and guidelines at department level in accordance with the quality standards developed by the Deanship of Academic Development and Quality Assurance.

The internal evaluation of the quality of the degree programmes is mainly provided through student and alumni surveys. Students give their feedback on the courses and the programmes through online questionnaires (Course Evaluation Survey (CES), Programme Evaluation Survey (PES), and Student Experience Survey (SES). In addition, every year an Alumni Survey and an Employer satisfaction's survey is conducted.

As the peers learn during the audit, there is a student council on university, college, and department level with students' representatives from all batches (female and male). Through the student councils, students' suggestions on all issues concerning the teaching and learning processes are received and discussed within the College of Science and the departments. All of the topics brought up by the students are addressed during the sessions of the student councils and subsequently by the College and Department Councils. Moreover, students can also complain directly to the Dean, the Head of Department. In addition, there are several student associations, which organise extracurricular activities such as arts, sports, religion etc..

The alumni survey has the goal to assess the graduates' satisfaction of the graduates on the quality of information and awareness they received about the work environment and lifelong learning, the quality of the knowledge and skills they gained from their education, their relationship with staffs and professors especially the guidance they received in choosing their career and the facilities available to them during their education. The Alumni Committee of each Department writes an annual report about the graduates, including their careers and how long it does take them to find their first job. Moreover, an employer satisfaction survey is conducted to find out the employers' opinion on the graduates' general knowledge, work habits, work related know how, discipline and professionalism, conceptual and communication skills, and also on personal and employment related competencies.

The Alumni Committees are also helping graduates to find a suitable job and to guide them in their career paths to ensure a long-term relationship with the university. To this end, they conduct interviews with graduates and train them in special skills, while applying for jobs, this includes preparing CVs. An annual plan for graduates is also prepared that contains a number of workshops and training courses that should help the graduates to succeed in their career path. In general, the job perspectives are very good, a large share of the graduates work as teachers in high schools, primary and intermediate schools, or vocational colleges.

As Jazan University considers the employers and partners to be one of the most important benefactors of higher education programmes, coordination between higher education institutions and the labour market has is an important task with goal of integrating the outcomes of academic programmes with industrial requirements. This collaboration is also critical in order to keep up with the quick and continuous development in the different scientific areas and the needs of the industrial sectors. For these reasons, all four departments of the College of Science have established an Advisory Committee whose members come from the industry as well as educational sectors. The programmes benefit from the committee members' views on possible changes in the curricula, the degree of suitability of the graduates' competencies with the requirements of the labour market, and the participation in the evaluation and further development of the programmes,

External quality assurance focuses on national accreditation. National accreditation is conducted by the National Commission for Academic Accreditation and Assessment (NCAAA), under the Ministry of Higher Education, Kingdom of Saudi Arabia. National accreditation of the programme within the university is a legal obligation for every study programme.

The peers see that there are regular meetings with all stakeholders on faculty and programme level where they discuss the needs and requirements of the employers and possible changes to the degree programmes. As the peers 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 external stakeholders in the quality assurance process. Moreover, Jazan University and the Departments at the College of Science stay in close contact with their alumni.

The peers confirm that students are directly involved in the quality assurance processes. They appreciate the comprehensive quality assurance system with involvement of all stakeholders, which is a strong point of the undergraduate programmes.

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:**

Jazan University does not comment on this criterion in its statement.

The peers consider criterion 6 to be fulfilled.

## **D Additional Documents**

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

- none

## **E Comment of the Higher Education Institution (23.03.2023)**

The College of Science at Jazan University extends its sincere gratitude to the audit team for conducting a meticulous evaluation of the Bachelor degree programs offered by the College. We highly appreciate the valuable recommendations provided by the auditors, and we assure you that they will be given due consideration in the development of the study plans for our programs. We are also immensely grateful to ASIIN for conducting an in-depth review of our course modules, and for providing outstanding performance and excellent feedback. The report submitted by ASIIN was thoroughly reviewed by all members of the program committee, and their inputs were subsequently evaluated by the College administration, including the Dean and Vice Deans.

The College of Science at Jazan University provides the following statement:

### **Curriculum**

- 1- (ASIIN1.3)** The peers discuss with the programme coordinators why neither of the four-degree programmes includes any electives.
- 2- (ASIIN2.1)** The peers observe that there are a lot of small courses (with 2 or 3 CH) that could be grouped in larger modules. For example, in the Bachelor's degree programmes Physics, there is a lack of systematic and a clear division into experimental and theoretical physics cannot really be seen.

### **Institution response**

The four programs initiated a study plan update a year ago, which includes offering elective courses and grouping them based on their scientific focus. This is an ongoing process, taking into account the observations of peers on grouping small courses (2-3CH) into larger courses.

The Biology Program aims to introduce modern courses by increasing the credit hours of biotechnology and molecular biology. It also plans to add new disciplines to the new plan, such as biomedicine, pharmacology, and reproductive biology.

The Chemistry Program will introduce new courses that are connected to the labor market.

The Mathematics Program will introduce new topics by increasing the credit hours in the new study plan.

The Physics Program has introduced larger courses by grouping related small courses, such as Waves and Optics. Geometrical Optics and Physical Optics courses will now be grouped under Waves and Optics, while Thermodynamics and Statistical Physics courses will be grouped under Thermodynamics and Statistical Physics. Atomic and Molecular Physics will be part of Modern Physics, while theoretical courses will be grouped under Theoretical Physics, and experimental laboratory courses will be grouped under Experimental Physics. The latter will have more credit hours (6-8) to provide more practical work and allow students to enhance their competencies and skills. Furthermore, the program will offer elective courses and group them according to their scientific focus, such as Material Science, Nuclear and Particles Physics, Laser and Photonics, and Space Physics.

### Teaching Laboratories

**(ASIIN2.1)** The peers see that the various teaching laboratories, ..., However, the share of practical laboratory work in the Bachelor's degree programmes Chemistry and Biology is rather low by international standards and should be increased. Chemistry and biology students should get more hands-on experience in the laboratory. In addition, Chemistry students should learn to synthesize compounds applying the most relevant synthesis techniques. Moreover, they should be able to purify (distillation, crystallization, chromatography techniques) and to characterize their own products and therefore to rely on refractometers, IR-spectrometers, and mass spectrometry (coupled with gas chromatography and/or HPLC).

#### Institution response

The Chemistry laboratories are designed to teach students how to synthesize compounds using appropriate techniques. The laboratory component of courses (231CHEM-3, 232CHEM-3, 323CHEM-3, and 438CHEM-3) focuses on the synthesis of compounds, while course (313CHEM-3) covers purification techniques such as distillation, crystallization, and chromatography. Furthermore, the laboratories enable students to characterize their products using various techniques such as refractometers, infrared spectrometers, and mass



spectrometry. Gas chromatography and/or HPLC are also used for this purpose. All laboratory manuals can be accessed through the following link:

<https://www.jazanu.edu.sa/sites/default/files/2023-03/lab%20manual-English.pdf>

### **Workload and Credits (ECTS) and Module Description**

**1- (ASIIN2.2)** The peers point out that the College of Science should follow the ECTS Users' Guide to determine the students' total workload. As described in the ECTS Users' Guide, the estimation of students' workload should include all learning activities. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study and examinations. ,....., In summary, the peers confirm that all four undergraduate programmes have a high but manageable workload.

**2- (ASIIN5.1)** However, while analysing the module handbooks, the peers see that the module descriptions do not include the necessary information about the awarded credit hours and ECTS points and the students' total workload (contact hours, time for self-studies). For this reason, the peers expect Jazan University to update the module descriptions and include all required information.

#### **Institution response**

The four programs have re-evaluated their calculation of ECTS in accordance with the ECTS User's Guide to determine the total workload of students. The estimation of students' workload encompasses all learning activities, including preparation for lectures, practical work, quizzes, midterm exams, projects, activities, homework, course final examinations, practical final examinations, and other related activities. The estimation is carried out through student questionnaires and the opinions of the course coordinators. ECTS is included in the study plan, program specifications, program handbook, and curricula manual, which can be accessed through the program's websites. The new study plans, along with the new estimations, are presented in the following tables.

### **Biology study Plane**

Level	Course code	Course Name	Required or elective	Pre-requisite courses	Credit hours	Type of requirements (Institute, College or Dept.)	Work load	ECTS
Level 1	101ISLM	Islamic Culture 1	R	-	2	Institution	103.6	3.7
	105ENGL	English Language	R	-	6	College	310.8	11.1
	101BIO	General Biology	R	-	4	College	207.2	7.4
	101MATH	General Mathematics	R	-	3	College	154	5.5
	101COMP	Introduction Computer Science	R	-	3	Institution	154	5.5
Total credit hours of Level 1					18		929.6	33.2
Level 2	102ISLM	Islamic Culture 2	R	-	2	Institution	103.6	3.7
	101ARAB	Linguistic Skills	R	-	2	Institution	103.6	3.7
	101PHYS	General Physics	R	-	4	College	207.2	7.4
	101CHEM	General Chemistry	R	-	4	College	207.2	7.4
	106ENGL	Scientific English	R	-	3	College	154	5.5
Total credit hours of Level 2					15		775.6	27.7
Level 3	102ARAB	Arabic Editing	R	-	2	Institution	103.6	3.70
	211BIO	Cell Biology	R	-	3	Department	141	5.03
	231MIC	Bacteriology	R	-	2	Department	128	4.57
	241BOT	Plant Morph.& Anatomy	R	101BIO	3	Department	169	6.03
	251ZOO	Invertebrates	R	-	3	Department	169	6.03
	203CHEM	Organic Chemistry	R	-	3	Department	165	5.89
	205MATH	Biostatistics	R	-	2	Department	125	4.46
Total credit hours of Level 3					18		1000.6	35.71
Level 4	103ISLM	Islamic Culture 3	R	-	2	Institution	103.6	3.70
	222BIO	General Genetics	R	-	2	Department	120	4.28
	232MIC	Virology	R	-	2	Department	113	4.03
	242BOT	Archegoniates	R	241BOT	2	Department	113	4.03
	252ZOO	Histology	R	-	2	Department	108	3.85
	254ZOO	Chordates	R	-	3	Department	170	6.07
	204CHEM	Biochemistry	R		3	Department	173	6.17
Total credit hours of Level 4					16		900.6	32.13
Level 5	301BIO	Fundamental of Ecology	R	-	2	Department	105	3.75
	311BIO	Specimen Technique	R	211BIO	2	Department	113	4.03
	331MIC	Phycology	R	-	2	Department	110	3.92
	333MIC	Mycology & Plant Pathology	R	-	2	Department	161	5.75
	341BOT	Plant Water Relationships	R	241BOT	2	Department	123	4.39
	351ZOO	Animal Physiology	R	-	3	Department	166	5.92
	353ZOO	Marine Biology	R	251BIO	3	Department	173	6.17
Total credit hours of Level 5					16		951	33.93
Level 6	334MIC	Microbial Physiology	R	231MIC	3	Department	170	6.07
	342BOT	Taxonomy Flowering Plants	R	241BOT	2	Department	104	3.71
	344BOT	Plant Hormones	R	241BOT	2	Department	121	4.32
	352ZOO	Parasitology	R	251ZOO	2	Department	113	4.03

	354ZOO	Immunology & Serology	R	-	2	Department	117	4.17
	356ZOO	General Entomology	R	251ZOO	3	Department	164	5.85
Total credit hours of Level 6					14		789	28.15
Level 7	411BIO	Molecular Biology	R	211Bio/222Bio	2	Department	152	5.42
	431MIC	Industrial Microbiology	R	334MIC	2	Department	121	4.32
	433MIC	Medical Microbiology	R	334MIC	2	Department	113	4.03
	441BOT	Plant Physiology	R	331BOT	3	Department	173	6.17
	443BOT	Plant Ecology	R	301BIO	3	Department	113	4.03
	451ZOO	Endocrinology	R	351ZOO	2	Department	124	4.42
	491BIO	Graduation Project	R	Pass Level 6	2	Department	173	6.17
Total credit hours of Level 7					16		969	34.56
Level 8	104ISLM	Islamic Culture 4	R	-	2	Institution	125	4.46
	402BIO	Biodiversity	R	301BIO	2	Department	119	4.25
	412BIO	Biotechnology	R	411BIO	2	Department	127	4.53
	432MIC	Environmental Microbiology	R	334MIC	2	Department	116	4.14
	442BOT	Economic Botany	R	-	2	Department	123	4.39
	452ZOO	Embryology	R	-	2	Department	113	4.03
	454ZOO	Animal Ecology & Behaviour	R	-	2	Department	123	4.39
	456ZOO	Medical Economic Entomology.	R	356ZOO	3	Department	165	5.89
Total credit hours of level 8					17		1011	36.08
Total					130		7326.4	261.46

## Chemistry Study Plane

Level	Course Code	Course Title	Required or Elec- tive	Pre-Requi- site Courses	Contact Hours		Total Credit Hours	workload	ECTS
					Lecture	Prac.			
First Year									
Level 1	101ISLM 2	Islamic Culture 1	R		2	0	2	103.6	3.7
	105ENGL-6	English Language	R		12	3	6	310.8	11.1
	101BIO-4	General Biology	R		3	2	4	207.2	7.4
	101MATH-3	General Mathematics	R		3	0	3	154	5.5
	101COMP-3	Introduction Computer Sci.	R		2	2	3	154	5.5
	Total of Level 1				22	7	18	997.0	35.6
Level 2	1012ISLM-2	Islamic Culture 2	R		2	0	2	103.6	3.7
	101ARAB-2	Linguistic Skills	R		2	0	2	103.6	3.7
	101PHYS-4	General Physics	R		3	2	4	207.2	7.4
	101CHEM-4	General Chemistry	R		3	2	4	207.2	7.4
	106ENGL-3	Scientific English	R	105ENGL	3	0	3	154	5.5
	Total of Level 2				13	4	15	775.6	27.7
TOTAL of Year 1					35	11	33	1827.8	60.9
Second Year									
Level 3	102ARAB-2	Arabic Editing	R		2	0	2	103.6	3.7
	103ISLM-2	Islamic culture 3	R		2	0	2	103.6	3.7
	201MATH-3	Calculus	R		3	0	3	154	5.5

	231CHEM-3	Aliphatic organic Chemistry	R		2	2	3	166.2	5.9
	211CHEM-3	Volumetric Analytical Chemistry	R		2	2	3	169	6.0
	201CHEM-3	General and physical Chemistry	R	101CHEM	3	2	4	221.5	7.9
	Total of Level 3				14	6	17	944.5	33.7
Level 4	104ISLM-2	Islamic Culture 4	R		2	0	2	110.8	3.7
	202MATH -3	Differential Equations	R	201MATH	3	0	3	166.2	5.5
	212CHEM-3	Chemistry of Gravimetric Analysis	R		2	2	3	185	6.6
	221CHEM-4	Chemistry of Main Groups	R		3	2	4	238	8.5
	232CHEM-3	Aromatic Organic Chemistry	R	231CHEM	2	2	3	169	6.0
	241CHEM-3	Thermodynamics	R		2	2	3	166.2	5.9
	Total of Level 4				14	8	18	1035.2	36.3
TOTAL of Year 2					28	14	35	1953.1	69.1
Third Year									
Level 5	313CHEM-3	Chromatographic Analysis	R		2	2	3	166.2	5.9
	322CHEM-4	Chemistry of Transition Elements	R	221CHEM	3	2	4	230.5	8.2
	333CHEM-3	Heterocyclic Organic Chemistry	R		2	2	3	192	6.9
	342CHEM-3	Kinetic Chemistry	R		2	2	3	191	6.8
	343CHEM-3	Surface Chemistry & Catalysis	R		3	0	3	169	6.0
	Total of Level 5				12	8	16	948.7	33.9
Level 6	314CHEM-3	Electrochemical analysis methods	R		2	2	3	189	6.8
	323CHEM-3	Co-ordination Chemistry	R	322CHEM	2	2	3	166	5.9
	334CHEM-2	Spectroscopy of Organic Compounds	R		2	0	2	117	4.2
	335CHEM-3	Organic Reaction Mechanisms	R		2	2	3	166	5.9
	344CHEM-3	Electrochemistry	R		2	2	3	174	6.2
	Total of Level 6				10	8	14	812.00	29.00
TOTAL of Year 3					22	16	30	1760.70	62.88
Fourth Year									
Level 7	436CHEM-3	Chemistry of Natural Products	R		2	2	3	173	6.2
	437CHEM-2	Stereochemistry	R		2	0	2	110	3.9
	445CHEM-3	Solution Chemistry	R		2	2	3	167	6.0
	446CHEM-2	Polymer Chemistry	R		2	0	2	111	4.0
	447 CHEM-3	Quantum Chemistry	R	202MATH	3	0	3	182	6.5
	491CHEM-2	Graduation Project	R	Dep. Approval	1	2	2	110.8	4.0
	Total of Level 7				12	6	15	853.8	30.5
Level 8	415CHEM-4	Methods of Instrumental analysis	R	314CHEM	3	2	4	227.5	8.1
	424 CHEM-3	Lanthanides & Actinides	R	323CHEM	2	2	3	168	6.0
	425CHEM-2	Group Theory	R		2	0	2	114	4.1
	438CHEM-3	Organic applied chemistry	R		2	2	3	176.15	6.3
	439CHEM-3	Principles of Biochemistry	R		2	2	3	168	6.0
	448CHEM-2	Photochemistry	R		2	0	2	112	4.0
	Total of Level 8				13	8	17	965.7	34.5

TOTAL of Year 4	25	14	32	1819.5	64.98
Total	110.0	55.0	130.0	7238.4	257.8

## Mathematics Study Plane

Level	Course Code	Course Title	Required or Elec-tive	Pre-Requi-site Courses	Contact Hours		CH	Work Load	ECTS	Type of re-quirements (Institution, College or Dept.)
					Lec.	Prac.				
Level 1	101ISLM	Islamic Culture 1	R	---	2	-	2	103.6	3.7	Institution
	105ENGL	English Language	R	---	12	3	6	308	11	College
	101BIO	General Biology	R	---	3	2	4	207.2	7.4	College
	101MATH	General Mathematics	R	---	3	-	3	154	5.5	College
	101COMP	Introduction Computer Sci.	R	---	2	2	3	154	5.5	Institution
Level 2	102ISLM	Islamic Culture 2	R	---	2	-	2	103.6	3.7	Institution
	101ARAB	Linguistic Skills	R	---	2	-	2	103.6	3.7	Institution
	101PHYS	General Physics	R	---	3	2	4	207.2	7.4	College
	101CHE	General Chemistry	R	---	3	2	4	207.2	7.4	College
	106ENGL	Scientific English	R	---	3	-	3	154	5.5	College
Level 3	103ISLM	Islamic Culture (3)	R	---	2	-	2	103.6	3.7	Institution
	211MATH	Calculus (1)	R	101MATH	3	-	3	135	4.82	Department
	261MATH	Static	R	---	3	-	3	156	5.57	Department
	241MATH	Analytic Geometry	R	---	3	-	3	156	5.57	Department
	221MATH	Basis of Mathematics	R	101MATH	3	-	3	156	5.57	Department
	102ARAB	Arabic Editing	R	---	2	-	2	103.6	3.7	Institution
Level 4	103ISLM	Islamic Culture (4)	R	---	2	-	2	103.6	3.7	Institution
	251STAT	Mathematical statistics	R	101 MATH	3	-	3	156	5.57	Department
	222MATH	Abstract algebra (1)	R	221MATH	3	-	3	156	5.57	Department
	212MATH	Calculus (2)	R	211MATH	3	-	3	156	5.57	Department
	281COMP	Algorithmic and program-ming	R	101COMP	2	2	3	159	5.68	Department
Level 5	313MATH	Calculus (3)	R	212MATH	3	-	3	156	5.57	Department
	323MATH	Abstract algebra (2)	R	222MATH	3	-	3	156	5.57	Department
	362MATH	Dynamics	R	212MATH	3	-	3	156	5.57	Department
	331MATH	Differential Equations (1)	R	212MATH	3	-	3	171	6.11	Department
	352STAT	Probability theory	R	251STAT	3	-	3	156	5.57	Department
Level 6	363MATH	Analytical Mechanics	R	362MATH	3	-	3	156	5.57	Department
	314MATH	Complex Analysis	R	313MATH	3	-	3	171	6.11	Department
	324MATH	Linear Algebra	R	323MATH	3	-	3	156	5.57	Department
	315MATH	Real Analysis(1)	R	21MATH	3	-	3	156	5.57	Department
	316MATH	Numerical Analysis (1)	R	212MATH	3	-	3	156	5.57	Department
	332MATH	Differential Equations (2)	R	331MATH	3	-	3	171	6.11	Department
Level 7	442MATH	Topology	R	315MATH	3	-	3	171	6.11	Department
	425MATH	Discrete Mathematic	R	221MATH	3	-	3	156	5.57	Department
	434MATH	Partial Differential Equations	R	332MATH	3	-	3	171	6.11	Department
	453STAT	Applied statistics	R	251STAT	2	2	3	159	5.68	Department
	417MATH	Real Analysis(2)	R	315MATH	2	-	2	106	3.79	Department
	433MATH	Mathematical Methods	R	313MATH	3	-	3	156	5.57	Department
Level 8	443MATH	Differential Geometry	R	331MATH	3	-	3	171	6.11	Department
	472MATH	Mathematical modeling	R	332MATH	3	-	3	156	5.57	Department
	418MATH	Functional Analysis	R	417MATH	2	-	2	104	3.71	Department
	473MATH	Operation research	R	324MATH	3	-	3	171	6.11	Department
	464MATH	Fluid Mechanics	R	434MATH	3	-	3	171	6.11	Department

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Contact Hours		CH	Work Load	ECTS	Type of requirements (Institution, College or Dept.)
					Lec.	Prac.				
	419MATH	Numerical Analysis (2)	R	434MATH	3	-	3	171	6.11	Department
Total							130	6867.2	245.3	

## Physics Study Plane

Level	Course Code	Course Name	Re-quired Or Elective	Pre-Requisite Courses	Credit Hours			Work Load	ECTS	Type of requirement (Institution, College or Dept.)
					Lecture	Prac.	Total			
Level 1	101ISLM	Islamic Culture 1	R	----	2	-	2	103.6	3.7	Institution
	105ENGL	English Language	R	----	6	-	6	308	11	College
	101BIO	General Biology	R	----	3	1 (2)	4	207.2	7.4	College
	101MATH	General Mathematics	R	----	3	-	3	154	5.5	College
	101COMP	Intro. Comp. Sci.	R	----	2	1(2)	3	154	5.5	Institution
Level 2	102ISLM	Islamic Culture 2	R	----	2	-	2	103.6	3.7	Institution
	101ARAB	Linguistic Skills	R	----	2	-	2	103.6	3.7	Institution
	101PHYS	General Physics	R	----	3	1(2)	4	207.2	7.4	College
	101CHEM	General Chemistry	R	----	3	1(2)	4	207.2	7.4	College
	106ENGL	Scientific English	R	105ENGL	3	0	3	154	5.5	College
Level 3	102ARAB	Arabic Editing	R	----	2	-	2	103.6	3.7	Institution
	221PHYS	Prop. of Mat&Heat	R	----	3	1(2)	4	204.4	7.3	Department
	231PHYS	Electricity and Magn.	R	----	3	1(2)	4	204.4	7.3	Department
	251PHYS	Classical Mechanics	R	----	3	-	3	154	5.5	Department
	201MATH	Diff. and Integ.	R	----	3	-	3	154	5.5	Department
Level 4	103ISLM	Islamic Culture 3	R	----	2	-	2	103.6	3.7	Institution
	202MATH	Differential Equation	R	201MATH	3	-	3	154	5.5	Department
	211PHYS	Geometrical Optics	R	----	2	1(2)	3	168	6	Department
	212PHYS	Waves and Vibrations	R	251 PHYS	2	-	2	106.4	3.8	Department
	222PHYS	Thermodynamic	R	221 PHYS	3	-	3	155.12	5.54	Department
Level 5	252PHYS	Mathematical Physics	R	201MATH	3	-	3	155.96	5.57	Department
	301STAT	Statistics	R	----	2	-	2	103.6	3.7	Department
	311PHYS	Electronics (1)	R	231 PHYS	3	-	3	154	5.5	Department
	312PHYS	Physical Optics	R	211 PHYS	3	1(2)	4	218.4	7.8	Department
	331PHYS	Electrodynamics	R	231 PHYS	3	-	3	154	5.5	Department
	341PHYS	Modern Physics (1)	R	----	3	-	3	162.4	5.8	Department
Level 6	351PHYS	Analytical Mechanics	R	251 PHYS	3	-	3	159.6	5.7	Department
	104ISLM	Islamic Culture 4	R	----	2	-	2	103.6	3.7	Institution
	301COMP	Computer Prog.	R	101 COM	2	1(2)	3	154	5.5	Department
	342PHYS	Atomic Physics & Spec	R	312 PHYS	3	1(2)	4	207.2	7.4	Department
	352PHYS	Q. Mechanics (1)	R	252 PHYS	3	-	3	168	6	Department
	353PHYS	Statistical Physics	R	222 PHYS &	2	-	2	112	4	Department

				301 STAT						
	371PHYS	Solid State Physics (1)	R	311 PHYS	3	-	3	156.8	5.6	Department
Level 7	411PHYS	Electronics (2)	R	311 PHYS	3	1(3)	4	224	8	Department
	412PHYS	Laser & Its Appl.s	R	312 PHYS	3	-	3	159.6	5.7	Department
	451PHYS	Q. Mechanics (2)	R	352 PHYS	3	-	3	156.8	5.6	Department
	461PHYS	Nuclear Physics (1)	R	352 PHYS	3	-	3	151.2	5.4	Department
	491PHYS	Graduation Project	R	Dept.Ap-prov.	2	-	2	168	6	Department
Level 8	441PHYS	Modern Physics (2)	R	342 PHYS	3	1(3)	4	224	8	Department
	452PHYS	Plasma Physics	R	353 PHYS	3	-	3	140	5	Department
	462PHYS	Nuclear Physics (2)	R	461 PHYS	3	1(3)	4	224	8	Department
	471PHYS	Solid State Physics (2)	R	371 PHYS	3	1(3)	4	224	8	Department
Total							130	6891.08	246	

### Graduation Projects

The auditors cited the following points distributed among ASIIN criterion as follows:

- 1- (ASIIN1.3, ASIN3.0) the Bachelor's degree programme Mathematics does not include any graduation project.
- 2- (ASIIN1.3) In addition, not all graduation projects reviewed by the auditors during the on-site-visit reflect an adequate scientific level,....., and scientific demand of the graduation project is rather low by international standards.
- 3- (ASIIN3.0) The only weak point they identify is the Final Project. During the audit, the peers inspect sample exams and final theses (final projects). Not all theses shown to the auditors correspond to scientific standards, as would have been expected based on the project description. The auditors consider scientific working standards, ethics in science, and concepts of writing scientific publications essential for graduating from scientific study programmes. Currently, the final project is usually literature based, but from the auditors' point of view, practical work or experiments should be an essential part of each thesis.
- 4- (ASIIN3.0) In case students work as a group when preparing a final project, the individual contribution of every student has to be apparent and clearly stated in the thesis in order to allow the individual contributions to be assessed. A reasonable limit for group size for conducting a graduation project is four students.
- 5- (ASIIN3.0) In order to meet international standards, the auditors expect the College of Science to reconsider the scope, experimental background and documentation of the

final project. Setting international standards will be the key for students to continue their academic education, particularly abroad, and will support graduates in finding a science-related job in the private sector or at universities.

**Institution response**

The Mathematics program will implement the graduation project on the updated study plan. However, for the Biology, Chemistry, and Physics programs, the new regulations of Jazan University implemented this semester. Accordingly, students were grouped in teams of three to four individuals during the current semester. The instructor and a referee will use rubrics for evaluation of the group work competencies.

For all four programs, the new study plans will broaden the scope of the final project, which will be worth 4-5 CH and distributed over the last two successive semesters. This approach will enable our students to carry out a high-quality project based on practical work as an essential component of the graduation thesis and based on scientific standards and ethics.

**Examination**

**(ASIIN3.0)** some written examinations, however, leave the impression behind that student seem to succeed in learning by heart and are merely reproducing this knowledge. This approach, in combination with prevalence of written assessments, and the fact that almost none of the exams is oral, casts doubts whether the selection of methods adequately prepares students for future careers in research-oriented professions. In order to better meet international scientific standards and to ensure that the intended learning outcomes of the courses are met, the auditors recommend implementing more competence-oriented examination methods, for example oral examinations and presentations, which also foster the students' critical thinking.

**Institution response**

For all four programs, course specifications are based on NCAAA templates. Each course has specific learning outcomes that are targeted by assessment. The course assessment comprises two parts: the first part constitutes 50% of the total course marks and includes mid-terms, quizzes, homework, group discussions, oral and/or lab work. Typically, this part



is formative assessment based on rubrics and includes all forms of written, oral exams, and presentations, as well as observations. Additionally, values assessment is considered in this part.

The final exam part is a written exam, which constitutes the remaining 50% and has two main assessment domains: knowledge and skills. The knowledge and understanding-based domain is assessed using relatively simple questions, such as state, define, and/or multiple-choice questions. However, in high-level courses, the knowledge part accounts for a small portion of the total marks, as can be seen in the attached final exam samples of different high-level program courses.

The assessment process for the above-mentioned parts of course learning outcomes is monitored by the Teaching and Learning College Unit at the end of each semester. The Teaching and Learning College Unit reports feedback weaknesses to the Vice Dean for Development and program chairs to consider improvements for the next semester. This is to ensure that the course coordinator assesses all the learning outcomes defined in the course specification with its defined weight.

### **Diploma Supplement**

**(ASIIN5.2)** The Diploma Supplement should follow the internationally recognized European template. The Transcript of Records lists all the courses that the graduate has completed, the achieved grades, and cumulative GPA. However, the Transcript of Records should also list the awarded credit hours and ECTS points for each course.

#### **Institution response**

In response to the suggestion made by the Audit team, it has been decided that the implementation of the Diploma Supplement will positively impact the opportunities of our graduates in terms of employment and further studies abroad, such as Master's and Ph.D. programs. The Diploma Supplements for all four programs will be developed in accordance with the ASIIN template, which can be found in the attached files. Furthermore, JU and the College of Science are committed to adopting this system and introducing the appropriate protocol for the benefit of our graduates.

### Relevant rules

**(ASIIN5.3)** the peers point out that the English homepages of all four degree programmes need to be updated in order to include all necessary information about the respective programme (study plan, learning outcomes, module descriptions, and link to academic guidelines).

#### **Institution response**

The English homepages of all four-degree programs have been similarly updated to include all necessary information regarding the respective program, such as the study plan, learning outcomes, module descriptions, and links to academic guidelines. The updates can be accessed through the following links:

#### **Biology Link:**

<https://www.jazanu.edu.sa/en/colleges/sci/bio>

#### **Chemistry link:**

<https://www.jazanu.edu.sa/en/colleges/sci/chem>

#### **Mathematics Link:**

<https://www.jazanu.edu.sa/en/colleges/sci/math-department>

#### **Physics Link:**

<https://www.jazanu.edu.sa/en/colleges/sci/physics-department>

### Teaching load

**(ASIIN4.1)** However, the teachers from the Department of Mathematics point out during the audit, that their teaching load is quite high with approximately around 15 to 16 hours per week. This is high, especially in comparison with the other departments at the College of Science. For this reason, the College of Science should verify the teacher's teaching load at the Department of Mathematics and ensure that it does not exceed the maximum load so that teachers have enough time for their other tasks.

#### **Institution response**

The teaching workload of the faculty members is regulated by the rules set forth by the Ministry of Education. The allocated credit hours for this workload are as follows: 16 credit

hours for lecturers, 14 credit hours for assistant professors, 12 credit hours for associate professors, and 10 credit hours for full professors. In the aforementioned case, the workload of 15-16 credit hours was assigned to a lecturer.

### **Funds and equipments**

**(ASIIN 4.3)** The Department of Mathematics should regularly update the hardware in the labs and should receive more funds to provide more mathematics and science programme packages for the computer labs. This goes hand-to-hand to having a final project in the mathematics program. It is necessary to give the students the proper resources and training (both in hardware and software, as well as theoretical skills) if they are going to write a thesis that is up to the international standards.

#### **Institution response**

The Mathematics program is taking immediate action following a peer visit to upgrade the software and hardware facilities in its labs (as can be seen in the **attached file**).

## F Summary: Peer recommendations (14.04.2023)

Taking into account the additional information and the comments given by Jazan University, 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	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Mathematics	With requirements for one year	-	30.09.2028
Ba Physics	With requirements for one year	-	30.09.2028

### Requirements

#### For all degree programmes

- A 1. (ASIIN 2.2) Define how many hours of students' workload are required for one ECTS point.
- A 2. (ASIIN 5.1) Rewrite the module descriptions to include information about the students' workload and the awarded ECTS points.
- A 3. (ASIIN 5.2) The Transcript of Records needs to list the awarded credit hours and ECTS points for each course.

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

- A 4. (ASIIN 2.1) Introduce a compulsory final project.

#### For the Bachelor's degree programmes Biology, Chemistry, and Physics

- A 5. (ASIIN 3) It is necessary to significantly increase the scope and scientific demand of the final project.

### Recommendations

#### For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to further improve the English proficiency of the students.
- E 2. (ASIIN 2.1) It is recommended to further promote the students' academic mobility and to establish more international cooperations.
- E 3. (ASIIN 2.1) It is recommended to introduce electives and to group together small courses in larger modules.
- E 4. (ASIIN 2.4) It is recommended to establish eduroam at Jazan University and to increase the Linux capabilities.
- E 5. (ASIIN 3) It is recommended to implement more competence-oriented examination methods and to foster the students' critical thinking in the exams.

**For the Bachelor's degree programmes Biology and Chemistry**

- E 6. (ASIIN 2.1) It is recommended to increase the share of practical work.

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

- E 7. (ASIIN 2.1) It is recommended to put a stronger focus on modern aspects of biology.

**For the Bachelor's degree programmes Physics**

- E 8. (ASIIN 4.3) It is recommended to expand the research facilities.

**For the Bachelor's degree programmes Mathematics**

- E 9. (ASIIN 4.3) It is recommended to verify the teachers' workload in order to make sure that they have enough time for their other tasks, especially for conducting research activities.

## **G Comment of the Technical Committees (12.06.2023)**

### **Technical Committee 09 – Chemistry, Pharmacy (02.06.2023)**

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

The procedure was conducted on-site in Saudi Arabia in January. The expert group included both women and men so that a visit to the separate women's campus was possible. However, the discussion rounds were held jointly. The points of criticism concern, on the one hand, the calculation of the students' workload and the awarding of ECTS points and, on the other hand, the lack of a final thesis in mathematics and the insufficient scientific depth of the bachelor theses in biology, chemistry, and physics. In each case, requirements are proposed by the expert group. In addition, nine recommendations are considered.

The Technical Committee discusses the procedure and agrees with the proposed requirements and recommendations.

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

<b>Degree Programme</b>	<b>ASIIN-seal</b>	<b>Subject-specific label</b>	<b>Maximum duration of accreditation</b>
Ba Biology	With requirements for one year	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Mathematics	With requirements for one year	-	30.09.2028
Ba Physics	With requirements for one year	-	30.09.2028

## Technical Committee 10 – Life Sciences (12.06.2023)

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

The procedure was conducted on-site in Saudi Arabia in January. The expert group included both women and men so that a visit to the separate women's campus was possible. However, the discussion rounds were held jointly. The points of criticism concern, on the one hand, the calculation of the students' workload and the awarding of ECTS points and, on the other hand, the lack of a final thesis in mathematics and the insufficient scientific depth of the bachelor theses in biology, chemistry, and physics. In each case, requirements are proposed by the expert group. In addition, nine recommendations are considered.

The Technical Committee discusses the procedure and agrees with 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 label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Mathematics	With requirements for one year	-	30.09.2028
Ba Physics	With requirements for one year	-	30.09.2028

## Technical Committee 12 – Mathematics (09.06.2023)

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

The Technical Committee discusses the requirements and recommendations suggested by the expert panel and follows the assessment with changes in the recommendation E4. The Technical Committee suggests to delate the part of the sentence on “increasing Linux capabilities” since the members of the Technical Committee prefer not to recommend any computer platforms or systems brands.

The Technical Committee 12 – Mathematics recommends 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	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Mathematics	With requirements for one year	-	30.09.2028
Ba Physics	With requirements for one year	-	30.09.2028

## Recommendations

E 4. (ASIIN 2.4) It is recommended to establish eduroam at Jazan University.

## Technical Committee 13 – Physics (12.06.2023)

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

The Technical Committee discusses the procedures and follows the assessment of the auditors without any changes.

The Technical Committee 13 – Physics recommends 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	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Mathematics	With requirements for one year	-	30.09.2028
Ba Physics	With requirements for one year	-	30.09.2028



## H Decision of the Accreditation Commission (23.06.2023)

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

The AC discusses the procedure and decides to follow the suggestions of the experts and the TCs. As a result, the recommendation E4 is changed according to the suggestion of TC 12 – Mathematics. Otherwise, the proposed requirements and recommendations are accepted without any changes.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Mathematics	With requirements for one year	-	30.09.2028
Ba Physics	With requirements for one year	-	30.09.2028

### Requirements

#### For all degree programmes

- A 1. (ASIIN 2.2) Define how many hours of students' workload are required for one ECTS point.
- A 2. (ASIIN 5.1) Rewrite the module descriptions to include information about the students' workload and the awarded ECTS points.
- A 3. (ASIIN 5.2) The Transcript of Records needs to list the awarded credit hours and ECTS points for each course.

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

- A 4. (ASIIN 2.1) Introduce a compulsory final project.

#### For the Bachelor's degree programmes Biology, Chemistry, and Physics

- A 5. (ASIIN 3) It is necessary to significantly increase the scope and scientific demand of the final project.

## **Recommendations**

### **For all degree programmes**

- E 1. (ASIIN 1.3) It is recommended to further improve the English proficiency of the students.
- E 2. (ASIIN 2.1) It is recommended to further promote the students' academic mobility and to establish more international cooperations.
- E 3. (ASIIN 2.1) It is recommended to introduce electives and to group together small courses in larger modules.
- E 4. (ASIIN 2.4) It is recommended to establish eduroam at Jazan University.
- E 5. (ASIIN 3) It is recommended to implement more competence-oriented examination methods and to foster the students' critical thinking in the exams.

### **For the Bachelor's degree programmes Biology and Chemistry**

- E 6. (ASIIN 2.1) It is recommended to increase the share of practical work.

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

- E 7. (ASIIN 2.1) It is recommended to put a stronger focus on modern aspects of biology.

### **For the Bachelor's degree programmes Physics**

- E 8. (ASIIN 4.3) It is recommended to expand the research facilities.

### **For the Bachelor's degree programmes Mathematics**

- E 9. (ASIIN 4.3) It is recommended to verify the teachers' workload in order to make sure that they have enough time for their other tasks, especially for conducting research activities.

## I Fulfilment of Requirements (28.06.2024)

### Analysis of the experts and the Technical Committees (14.06.2024)

#### Requirements

##### For all programmes

- A 1. (ASIIN 2.2) Define how many hours of students' workload are required for one ECTS point.

Initial Treatment	
Experts	Fulfilled Vote: unanimous Justification: Jazan University has defined that one ECTS point is equal to 28 learning hours.
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 12	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 13	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.

- A 2. (ASIIN 5.1) Rewrite the module descriptions to include information about the students' workload and the awarded ECTS points.

Initial Treatment	
Experts	Fulfilled Vote: unanimous Justification: Jazan University has updated the module descriptions, which now include information about the students' workload and the awarded ECTS points.
TC 09	Fulfilled

	Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 12	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 13	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.

- A 3. (ASIIN 5.2) The Transcript of Records needs to list the awarded credit hours and ECTS points for each course.

Initial Treatment	
Experts	Fulfilled Vote: unanimous Justification: Jazan University now includes the awarded credit hours and ECTS point in the documents awarded to the graduates.
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 12	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 13	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.

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

- A 4. (ASIIN 2.1) Introduce a compulsory final project.

Initial Treatment	
Experts	Fulfilled Vote: unanimous Justification: Jazan University will add a graduation research project (480MATH-4) in the current study plan for the Bachelor of Science in Mathematics.

TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 12	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 13	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.

**For the Bachelor's degree programmes Biology, Chemistry, and Physics**

A 5. (ASIIN 3) It is necessary to significantly increase the scope and scientific demand of the final project.

Initial Treatment	
Experts	Fulfilled Vote: unanimous Justification: Jazan University has decided to increase the scope of the graduation project from 2 to 4 credit hours. During the re-accreditation procedure, it should be verified if the scientific demand of the graduation project has also significantly improved.
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 12	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 13	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.

## Decision of the Accreditation Commission (28.06.2024)

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Biology	All requirements fulfilled	-	30.09.2028
Ba Chemistry	All requirements fulfilled	-	30.09.2028
Ba Mathematics	All requirements fulfilled	-	30.09.2028
Ba Physics	All requirements fulfilled	-	30.09.2028

## Appendix: Programme Learning Outcomes and Curricula

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

Domain		Program learning outcomes
Knowledge and understanding	K1	Display a broad knowledge and understanding of the principal, theories and concepts of Biology, in addition to the basic principles of chemistry, physics, and mathematics that form the foundation on which all of biology rests.
	K2	Demonstrate significant knowledge and understanding of the processes, techniques, mechanisms, functions, practices, conventions and terminology of Biology.
	K3	Express in-depth knowledge and understanding of research methodology and inquiry techniques in the field of Biology
Skills	S1	Apply broad integrated underlying theories, principles, and concepts in various contexts in Biology.
	S2	Practice methods of inquiry, investigation and research for complex issues and problems in Biology
	S3	Carry out various complex practical tasks and procedures related to Biology.
	S4	Communicate in main forms and use of specialized digital technology and ICT tools to demonstrate an understanding of theoretical knowledge and transfer specialized knowledge, skills and complex ideas to a variety of audiences.
Values, Autonomy and Responsibility	V1	Show confidence and potential for leadership, long life learning and entrepreneurship.
	V2	Consider risk assessment, and lab safety as a personal responsibility toward individuals and society.
	V3	Work collaboratively and constructively, and lead diverse teams to perform a wide range of tasks with responsibility, and play a major role in joint work planning and evaluation

The following **curriculum** is presented:

Level	Course code	Course Name	Required or elective	Pre-requisite courses	Credit hours	Type of requirements (inst., col. or de.)	ECTS
Level 1	101ISLM	Islamic Culture 1	R	-	2	Institution	3.34
	105ENGL	English Language	R	-	6	College	10.02
	101BIO	General Biology	R	-	4	College	6.68
	101MATH	General Mathematics	R	-	3	College	5.01
	101COMP	Introduction Computer Science	R	-	3	Institution	5.01
Total credit hours of Level 1					18		30.06
Level 2	102ISLM	Islamic Culture 2	R	-	2	Institution	3.34
	101ARAB	Linguistic Skills	R	-	2	Institution	3.34
	101PHYS	General Physics	R	-	4	College	6.68
	101CHEM	General Chemistry	R	-	4	College	6.68
	106ENGL	Scientific English	R	-	3	College	5.01
Total credit hours of Level 2					15		25.05
Level 3	102ARAB	Arabic Editing	R	-	2	Institution	3.34
	211BIO	Cell Biology	R	-	3	Department	5.01
	231MIC	Bacteriology	R	-	2	Department	3.34
	241BOT	Plant Morph.& Anatomy	R	101BIO	3	Department	5.01
	251ZOO	Invertebrates	R	-	3	Department	5.01
	203CHEM	Organic Chemistry	R	-	3	Department	5.01
	205MATH	Biostatistics	R	-	2	Department	3.34
Total credit hours of Level 3					18		30.06
Level 4	103ISLM	Islamic Culture 3	R	-	2	Institution	3.34
	222BIO	General Genetics	R	-	2	Department	3.34
	232MIC	Virology	R	-	2	Department	3.34
	242BOT	Archegoniates	R	241BOT	2	Department	3.34
	252ZOO	Histology	R	-	2	Department	3.34
	254ZOO	Chordates	R	-	3	Department	5.01
	204CHEM	Biochemistry	R	-	3	Department	5.01
Total credit hours of Level 4					16		26.72



Level 5	301BIO	Fundamental of Ecology	R	-	2	Department	3.34
	311BIO	Specimen Technique	R	211BIO	2	Department	3.34
	331MIC	Phycology	R	-	2	Department	3.34
	333MIC	Mycology & Plant Pathology	R	-	2	Department	3.34
	341BOT	Plant Water Relationships	R	241BOT	2	Department	3.34
	351ZOO	Animal Physiology	R	-	3	Department	5.01
	353ZOO	Marine Biology	R	251BIO	3	Department	5.01
Total credit hours of Level 5					16		26.72
Level 6	334MIC	Microbial Physiology	R	231MIC	3	Department	5.01
	342BOT	Taxonomy Flowering Plants	R	241BOT	2	Department	3.34
	344BOT	Plant Hormones	R	241BOT	2	Department	3.34
	352ZOO	Parasitology	R	251ZOO	2	Department	3.34
	354ZOO	Immunology & Serology	R	-	2	Department	3.34
	356ZOO	General Entomology	R	251ZOO	3	Department	5.01
Total credit hours of Level 6					14		23.38
Level 7	411BIO	Molecular Biology	R	211Bio/222Bio	2	Department	3.34
	431MIC	Industrial Microbiology	R	334MIC	2	Department	3.34
	433MIC	Medical Microbiology	R	334MIC	2	Department	3.34
	441BOT	Plant Physiology	R	331BOT	3	Department	5.01
	443BOT	Plant Ecology	R	301BIO	3	Department	5.01
	451ZOO	Endocrinology	R	351ZOO	2	Department	3.34
	491BIO	Graduation Project	R	Pass Level 6	2	Department	3.34
Total credit hours of Level 7					16		26.72
Level 8	104ISLM	Islamic Culture 4	R	-	2	Institution	3.34
	402BIO	Biodiversity	R	301BIO	2	Department	3.34
	412BIO	Biotechnology	R	411BIO	2	Department	3.34
	432MIC	Environmental Microbiology	R	334MIC	2	Department	3.34
	442BOT	Economic Botany	R	-	2	Department	3.34
	452ZOO	Embryology	R	-	2	Department	3.34
	454ZOO	Animal Ecology & Behavior	R	-	2	Department	3.34
	456ZOO	Medical Economic Entomology.	R	356ZOO	3	Department	5.01
Total credit hours of level 8					17		28.39
Total credit hours of Biology Program							217.1

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

<i>Knowledge and Understanding</i>	
Upon completion of the program, students are able to:	
K1	Demonstrate a broad understanding and critical view of the principal theories, concepts and terminology of chemistry area or field of work, and in addition the necessary background in Physics and Mathematics
K2	Describe correctly Chemical phenomena using chemical principles and scientific reasoning
<i>Skills</i>	
Upon completion of the program, students are able to:	
S1	Demonstrate an ability in critical thinking, numeracy, statistical, analytical reasoning, use graphs, charts for solving problems (in the synthesis, measurement, and modeling of chemical systems),
S2	Apply their experimental basics and skills to use laboratory equipment, modern instrumentation, and classical techniques for carrying out experiments in various fields of chemistry and to write a report representing the scientific data.
S3	Examine his material and lab safety background to Follow proper procedures and regulations for safe handling and use of chemicals.
S4	make effective use of communication, and online technology about chemistry topics in order to improve their basic knowledge in writing (report and paper) with a good verbal and clear scientific language.
<i>Values, Autonomy and Responsibility</i>	
Upon completion of the program, students are able to:	
V1	Work as a group leader in cooperation with other colleagues
V2	Perceive the ethical and social dimensions of practicing chemistry or any related field.

The following curriculum is presented:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours			ECTS
					L	P	T	
First Year								
Level 1	ISLM 101	Islamic Culture 1	R		2	0	2	3.34
	ENGL 105	English Language	R		12	3	6	10.02
	BIO 101	General Biology	R		3	2	4	6.68
	MATH 101	General Mathematics	R		3	0	3	5.01
	COMP 101	Introduction Computer Sci.	R		2	2	3	5.01
	Total of Level 1				22	7	18	30.06
Level 2	ISLM 102	Islamic Culture 2	R		2	0	2	3.34
	ARAB 101	Linguistic Skills	R		2	0	2	3.34
	PHYS 101	General Physics	R		3	2	4	6.68
	CHEM 101	General Chemistry	R		3	2	4	6.68
	ENGL 106	Scientific English	R	ENGL180	3	0	3	5.01
	Total of Level 2				13	4	15	25.05
TOTAL of Year 1					35	11	33	55.11
Second Year								
Level 3	ARAB 102	Arabic Editing	R		2	0	2	3.34
	ISLM 103	Islamic culture 3	R		2	0	2	3.34
	MATH 201	Calculus	R		3	0	3	5.01
	CHEM 231	Aliphatic organic Chemistry	R		2	2	3	5.01
	CHEM 211	Volumetric Analytical Chemistry	R		2	2	3	5.01
	CHEM 201	General and physical Chemistry	R	CHEM101	3	2	4	6.68
	Total of Level 3				14	6	17	28.39
Level 4	ISLM 104	Islamic Culture 4	R		2	0	2	3.34
	MATH 202	Differential Equations	R	MATH201	3	0	3	5.01
	CHEM 212	Chemistry of Gravimetric Analysis	R		2	2	3	5.01
	CHEM 221	Chemistry of Main Groups	R		3	2	4	6.68
	CHEM 232	Aromatic Organic Chemistry	R	CHEM 231	2	2	3	5.01
	CHEM 241	Thermodynamics	R		2	2	3	5.01
	Total of Level 4				14	8	18	30.06
TOTAL of Year 2					28	14	35	58.45

Third Year								
Level 5	CHEM 313	Chromatographic Analysis	R		2	2	3	5.01
	CHEM 322	Chemistry of Transition Elements	R	CHEM 221	3	2	4	6.68
	CHEM 333	Heterocyclic Organic Chemistry	R		2	2	3	5.01
	CHEM 342	Kinetic Chemistry	R		2	2	3	5.01
	CHEM 343	Surface Chemistry & Catalysis	R		3	0	3	5.01
Total of Level 5					12	8	16	26.72
Level 6	CHEM 314	Electrochemical analysis methods	R		2	2	3	5.01
	CHEM 323	Co-ordination Chemistry	R	CHEM 322	2	2	3	5.01
	CHEM 334	Spectroscopy of Organic Compounds	R		2	0	2	3.34
	CHEM 335	Organic Reaction Mechanisms	R		2	2	3	5.01
	CHEM 344	Electrochemistry	R		2	2	3	5.01
Total of Level 6					10	8	14	23.38
TOTAL of Year 3					22	16	30	50.1
Fourth Year								
Level 7	CHEM 436	Chemistry of Natural Products	R		2	2	3	5.01
	CHEM 437	Stereochemistry	R		2	0	2	3.34
	CHEM 445	Solution Chemistry	R		2	2	3	5.01
	CHEM 446	Polymer Chemistry	R		2	0	2	3.34
	CHEM 447	Quantum Chemistry	R	202MATH	3	0	3	5.01
	CHEM 491	Graduation Project	R	Dep. Approval	1	2	2	3.34
Total of Level 7					12	6	15	25.05
Level 8	CHEM 415	Methods of Instrumental analysis	R	314CHEM	3	2	4	6.68
	CHEM 424	Lanthanides & Actinides	R	323CHEM	2	2	3	5.01
	CHEM 425	Group Theory	R		2	0	2	3.34
	CHEM 438	Organic applied chemistry	R		2	2	3	5.01
	CHEM 439	Principles of Biochemistry	R		2	2	3	5.01
	CHEM 448	Photochemistry	R		2	0	2	3.34
Total of Level 8					13	8	17	28.39
TOTAL of Year 4					25	14	32	53.44
Overall total					110	55	130	217.1

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

Program Learning Outcomes (PLO) and Teaching Strategies			
Code	Program Learning Outcomes	Teaching Strategies	Assessment Methods
Knowledge and Understanding			
K1	Distinguish mathematical concepts relevant to pure and applied mathematics.	Lectures, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
K2	Identify background science, features and structure of mathematical problem.	Lectures, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
K3	Explain notations and concepts required for the solution of Mathematical problem.	Lectures, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
Skills			
S1	Apply theoretical, computational or practical aspect relevant to course Content.	Lectures, problem solving, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
S2	Compute numerical quantities for various parameters to approximate the solution.	Lectures, problem solving, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
S3	Apply various mathematical rules, techniques and theorems in Application.	Lectures, problem solving, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
S4	Solve mathematical problem using critical thinking.	Lectures, problem solving, Classroom discussions.	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
Values			
V1	Cultivate a mathematical attitude and nurture the interest.	Micro-Project Teamwork Small Presentation Extempore	Similarity Group Assignment Observation Group Discussion
V2	Realize the importance of responsibilities through different modes of practice, competition and related activities		
V3	Inculcating values and ethics in thought, expression and deed.		

The following curriculum is presented:

First Year													
Level First						Level Second							
Course code	course name	Contact hours		ECTS	credit hours	prerequisit e	Course code	course name	Contact hours		ECTS	credit hours	Prerequi site
		Lecture r	Sec/Lab	Points					Lecture r	Sec/ Lab	Points		
Islm 101	Islamic Culture (1)	2	-	3.33	2	-	102 Islm	Islamic Culture (2)	2	-	3.33	2	-
101 Math	General Mathematics	3	-	5	3	-	101Chem	General Chemistry	3	2	6.67	4	-
101 Biol	General Biology	3	2	6.67	4	-	101 Phys	General Physics	3	2	6.67	4	-
101 Comp	Introduction to Computer Science	2	2	5	3	-	101 Arab	Language Skills	2	-	3.33	2	-
105 Engl	English Language	12	3	10	6	-	106 Engl	Scientific English Language	3	-	5	3	-
Total		22	7	30	18		Total		13	3	25	15	

Second Year															
Level Third							Level Fourth								
Course code	course name	Contact hours		ECTS	credit hours	prerequisit e	Course code	course name	Contact hours		ECTS	credit hours	Prerequisit e		
		Lecture r	Sec/Lab	Points					Lecture r	Sec/ Lab	Points				
103 Islm	Islamic Culture (3)	2	-	3.33	2	-	103 Islm	Islamic Culture (4)	2	-	3.33	2	-		
211 Math	Calculus (1)	3	-	5	3	101 Math	251 Stat	Mathematical statistics	3	-	5	3	101 Math		
261Math	Static	3	-	5	3	-	222 Math	Abstract algebra (1)	3	-	5	3	221 Math		
241 Math	Analytic Geometry	3	-	5	3	-	212 Math	Calculus (2)	3	-	5	3	211 Math		
221 Math	Basis of Mathematics	3	-	5	3	101 Math	271 Comp	Algorithmic and programming	2	2	5	3	102 Comp		
102 Arab	Arabic Editing	2	-	3.33	2	Total			13	2	23.33	14			
Total		16	-	26.66	16										

Third Year															
Level Fifth								Level Sixth							
Course code	course name	Contact hours		ECTS	cred it hours	prereq uisite	Course code	course name	Contact hours		ECT S	cre dit hours	Prereq uisit e		
		Lect urer	Sec/Lab	Points					Lectur er	Sec/Lab	Poin ts				
313 Math	Calculus (3)	3	-	5	3	212 Math	363 Math	Analytical Mechanics	3	-	5	3	362 Math		
323 Math	Abstract algebra (2)	3	-	5	3	222 Math	314 Math	Complex Analysis	3	-	5	3	313 Math		
362 Math	Dynamics	3	-	5	3	212 Math	324 Math	Linear Algebra	3	-	5	3	323 Math		
313 Math	Differential Equations (1)	3	-	5	3	212 Math	315 Math	Real Analysis(1)	3	-	5	3	212 Math		
352 Stat	Probability theory	3	-	5	3	251 Stat	316 Math	Numerical Analysis (1)	3	-	5	3	212 Math		
Total		15	-	25	15		332 Math	Differential Equations (2)	3	-	5	3	331 Math		
							Total		18	2	30	18			

Fourth Year														
Level Seven							Level Eight							
Course code	course name	Contact hours		ECTS	cred it hours	prereq uisite	Course code	course name	Contact hours		ECTS	cre dit hours	Prereq uisite	
		Lect urer	Sec/Lab	Points					Lectur er	Sec/La b	Points			
442 Math	Topology	3	-	5	3	315 Math	443 Math	Differential Geometry	3	-	5	3	331 Math	
425 Math	Discrete Mathematic	3	-	5	3	221 Math	472 Math	Mathematical modeling	3	-	5	3	332 Math	
434 Math	Partial Differential Equations	3	-	5	3	332 Math	418 Math	Functional Analysis	2	-	3.33	2	417 Math	
453 Stat	Applied statistics	2	2	5	3	251 Stat	473 Math	Operation research	3	-	5	3	324 Math	
417 Math	Real Analysis (2)	2	-	3.33	2	315 Math	464 Math	Fluid Mechanics	3	-	5	3	434 Math	
433 Math	Mathematical Methods	3	-	5	3	313 Math	419 Math	Numerical Analysis (2)	3	-	5	3	434 Math	
Total		16	2	28.33	17		Total		17	-	28.33	17		



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

P#	PLO's in various domains	Teaching strategies
1.0	Knowledge and Understanding	
1.1	Describe various fundamental concepts and theories of physics and their effect in different fields of science and technology	Lecturing- interactive discussion
1.2	Discuss physics phenomena using physics principles and scientific reasoning	Lecturing - interactive discussion
2.0	Skills	
2.1	Apply mathematical concepts, strategies and procedures to solve problems in various fields of physics.	Lecturing- Problem based teaching- Interactive discussion
2.2	Demonstrate analytical skills and competencies to formulate, drive and analyze physics concepts.	Lecturing- discussion-expository and discovery teaching
2.3	Perform experiments in various fields of Physics and analyzing their related data for various Physics parameters and quantities	Hands-on practice- expository and discovery - Interactive discussion- Guided discovery teaching
2.4	Develop competencies in critical thinking, delivering scientific information, reporting and data analysis.	Expository and discovery teaching- interactive discussion- problem based learning
3.0	Values	
3.1	Develop abilities of team work, bear individual responsibilities on assigned tasks	Expository and discovery - interactive discussion
3.2	Apply practices of life-long learning in various physics and scientific disciplines with ethical and social responsibilities for their professional career	Expository and discovery - interactive discussion
3.3	Demonstrate awareness of safety and risk assessment when dealing with various materials and equipment	Hands-on practice- expository and discovery - guided discovery teaching

The following **curriculum** is presented:

Year	Course Code	Course Name	Required or Elective	* Pre-Requisite	CH			ECTS	Learning Hours	Type of requirement (University College or Department)
					Th.	Prac	Tot			
Level 1	101ISLM	Islamic Culture 1	R	----	2	-	2	3.34	50	University
	105ENGL	English Language	R	----	6	-	6	10	140	College
	101BIO	General Biology	R	----	3	1(2)	4	6.68	125	College
	101MATH	General Mathematics	R	----	3	-	3	5	75	College
	101COMP	Introduction Comp. Sci.	R	----	2	1(2)	3	5	75	University
Level 2	102ISLM	Islamic Culture 2	R	----	2	-	2	3.34	50	University
	101ARAB	Linguistic Skills	R	----	2	-	2	3.34	50	University
	101PHYS	General Physics	R	----	3	1(2)	4	6.68	188	College
	101CHEM	General Chemistry	R	----	3	1(2)	4	6.68	125	College
	106ENGL	Scientific English	R	105 ENGL	3	0	3	5	75	College
Level 3	102ARAB	Arabic Editing	R	----	2	-	2	3.34	50	University
	221PHYS	Properties of Matter and Heat	R	----	3	1(2)	4	6.68	188	Department
	231PHYS	Electricity and Magnetism	R	----	3	1(2)	4	6.68	188	Department
	251PHYS	Classical Mechanics	R	----	3	-	3	5	113	Department
	201MATH	Differentiation and Integration	R	----	3	-	3	5	75	Department
Level 4	103ISLM	Islamic Culture 3	R	----	2	-	2	3.34	50	University
	202MATH	Differential Equation	R	201MATH	3	-	3	5	75	Department
	211PHYS	Geometrical Optics	R	----	2	1(2)	3	5	150	Department
	212PHYS	Waves and Vibrations	R	251 PHYS	2	-	2	3.34	75	Department
	222PHYS	Thermodynamic	R	221 PHYS	3	-	3	5	113	Department
	252PHYS	Mathematical Physics	R	201MATH	3	-	3	5	113	Department



Level 5	301STAT	Statistics	R	----	2	-	2	3.34	50	Department
	311PHYS	Electronics (1)	R	231 PHYS	3	-	3	5	113	Department
	312PHYS	Physical Optics	R	211 PHYS	3	1(2)	4	6.68	188	Department
	331PHYS	Electrodynamics	R	231 PHYS	3	-	3	5	113	Department
	341PHYS	Modern Physics (1)	R	----	3	-	3	5	113	Department
	351PHYS	Analytical Mechanics	R	251 PHYS	3	-	3	5	113	Department
Level 6	104ISLM	Islamic Culture 4	R	----	2	-	2	3.34	50	Institution
	301COMP	Computer Programming	R	101 COM	2	1(2)	3	5	75	Department
	342PHYS	Atomic Physics & Spectroscopy	R	312 PHYS	3	1(2)	4	6.68	188	Department
	352PHYS	Quantum Mechanics (1)	R	252 PHYS	3	-	3	5	113	Department
	353PHYS	Statistical Physics	R	222 PHYS 301 STAT	2	-	2	3.34	75	Department
	371PHYS	Solid State Physics (1)	R	311 PHYS	3	-	3	5	113	Department
Level 7	411PHYS	Electronics (2)	R	311 PHYS	3	1(3)	4	6.68	225	Department
	412PHYS	Laser & Its Applications	R	312 PHYS	3	-	3	5	113	Department
	451PHYS	Quantum Mechanics (2)	R	352 PHYS	3	-	3	5	113	Department
	461PHYS	Nuclear Physics (	R	352 PHYS	3	-	3	5	113	Department
	491PHYS	Graduation Project	R	Dept. Approval	2	-	2	3.34	75	Department
Level 8	441PHYS	Modern Physics (2)	R	342 PHYS	3	1(3)	4	6.68	225	Department
	452PHYS	Plasma Physics	R	353 PHYS	3	-	3	5	113	Department
	462PHYS	Nuclear Physics (2)	R	461 PHYS	3	1(3)	4	6.68	225	Department
	471PHYS	Solid State Physics (2)	R	371 PHYS	3	1(3)	4	6.68	225	Department
							130	217	4874	