هيئة جودة التعليم والتدريب
Education & Training Quality Authority
Kingdom of Bahrain - مملكة البحرين

Directorate of
Higher Education Reviews
Programme Review Report

University of Bahrain
College of Science

Bachelor of Science in Biology

Kingdom of Bahrain

Site Visit Date: 21 - 23 November 2022
HA059-C3-R059

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Acronyms

APR	Academic Programme Review
ASER	Annual Self-Evaluation Report
ASIIN	Accreditation Agency for Study Programmes in Engineering, Informatics, Natural Sciences and Mathematics
BQA	Education & Training Quality Authority
CILO	Course Intended Learning Outcome
CoS	College of Science
DHR	Directorate of Higher Education Reviews
HEC	Higher Education Council
HEI	Higher Education Institution
IT	Information Technology
ITC	Information Technology Centre
NQF	National Qualification Framework
PAC	Programme Advisory Committee
PEO	Programme Educational Objectives
PILO	Programme Intended Learning Outcome
QA	Quality Assurance
SAC	Student Advisory Committee
SER	Self-Evaluation Report
SIS	Student Information System
ToR	Terms of Reference
UoB	University of Bahrain

I. Introduction

In keeping with its mandate, the Education & Training Quality Authority (BQA), through the Directorate of Higher Education Reviews (DHR), carries out two types of reviews that are complementary. These are: Institutional Reviews, where the whole institution is assessed; and the Academic Programme Reviews (APRs), where the quality of teaching, learning and academic standards are assessed in academic programmes within various colleges according to specific standards and indicators as reflected in its Framework.

Following the revision of the APR Framework at the end of Cycle 1 in accordance with the BQA procedure, the revised APR Framework (Cycle 2) was endorsed as per the Council of Ministers' Resolution No.17 of 2019. Thereof, in the academic year (2019-2020), the DHR commenced its second cycle of programme reviews.

The Cycle 2 APR Review Framework is based on four main Standards and 21 Indicators, which forms the basis the APR Reports of the Higher Education Institutions (HEIs).

The **four** standards that are used to determine whether or not a programme meets international standards are as follows:

Standard 1: **The Learning Programme**

Standard 2: **Efficiency of the Programme**

Standard 3: **Academic Standards of Students and Graduates**

Standard 4: **Effectiveness of Quality Management and Assurance**

The Review Panel (hereinafter referred to as 'the Panel') decides whether each indicator, within a standard, is 'addressed', 'partially addressed' or 'not addressed'. From these judgments on the indicators, the Panel additionally determines whether each of the four standards is 'Satisfied' or 'Not Satisfied', thus leading to the Programme's overall judgment, as shown in Table 1 below.

Table 1: Criteria for Judgements

Criteria	Judgement
All four Standards are satisfied	Confidence
Two or three Standards are satisfied, including Standard 1	Limited Confidence
One or no Standard is satisfied	No Confidence
All cases where **Standard 1** is not satisfied	

The APR Review Report begins with providing the profile of the Programme under review, followed by a brief outline of the judgment received for each indicator, standard, and the overall judgement.

The main section of the report is an analysis of the status of the programme, at the time of its actual review, in relation to the review standards, indicators and their underlying expectations.

The report ends with a Conclusion and a list of Appreciations and Recommendations.

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II. The Programme's Profile

Institution Name*	University of Bahrain
College/ Department*	College of Science
Programme/ Qualification Title*	Bachelor of Science in Biology
Qualification Approval Number	University Council Decision No. (282) of 1993
NQF Level	8
Validity Period on NQF	5 years from the validation date
Number of Units*	12
NQF Credit	512
Programme Aims*	1. Enter the marketplace successfully and secure employment in the fields of life/ biological sciences, environment, and health. 2. Join and compete successfully in graduate-level studies or professional school programmes (medical school). 3. Utilize ethically and positively their learned knowledge and skills to serve their community and contribute to its advancement in the relevant field.
Programme Intended Learning Outcomes*	a. Comprehend a broad spectrum of knowledge in the major fields of science. b. Recognize the relationship between structure and function at the molecular, cellular and organismal level. c. Apply biological knowledge and techniques in the fields of biology. d. Communicate concepts in biology through the proper use of the vocabulary of the discipline. e. Analyze and/or Evaluate issues pertaining to biological sciences. f. Integrate IT skills, humanities, and social studies throughout biology program. g. Work independently and as a member of a team. h. Integrate ethics and self-development skills throughout the educational and professional life. i. Plan and execute a project based on a scientific method.

* Mandatory fields

III. Judgment Summary

The Programme's Judgment: Confidence

Standard/ Indicator	Title	Judgement
Standard 1	**The Learning Programme**	**Satisfied**
Indicator 1.1	The Academic Planning Framework	Partially Addressed
Indicator 1.2	Graduate Attributes & Intended Learning Outcomes	Addressed
Indicator 1.3	The Curriculum Content	Partially Addressed
Indicator 1.4	Teaching and Learning	Addressed
Indicator 1.5	Assessment Arrangements	Addressed
Standard 2	**Efficiency of the Programme**	**Satisfied**
Indicator 2.1	Admitted Students	Partially Addressed
Indicator 2.2	Academic Staff	Partially Addressed
Indicator 2.3	Physical and Material Resources	Addressed
Indicator 2.4	Management Information Systems	Addressed
Indicator 2.5	Student Support	Addressed
Standard 3	**Academic Standards of Students and Graduates**	**Satisfied**
Indicator 3.1	Efficiency of the Assessment	Addressed
Indicator 3.2	Academic Integrity	Partially Addressed
Indicator 3.3	Internal and External Moderation of Assessment	Addressed
Indicator 3.4	Work-based Learning	Partially Addressed

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Indicator 3.5	Capstone Project or Thesis/Dissertation Component	Addressed
Indicator 3.6	Achievements of the Graduates	Partially Addressed
Standard 4	**Effectiveness of Quality Management and Assurance**	**Satisfied**
Indicator 4.1	Quality Assurance Management	Addressed
Indicator 4.2	Programme Management and Leadership	Addressed
Indicator 4.3	Annual and Periodic Review of the Programme	Partially Addressed
Indicator 4.4	Benchmarking and Surveys	Partially Addressed
Indicator 4.5	Relevance to Labour Market and Societal Needs	Addressed

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IV. Standards and Indicators

> ## Standard 1
>
> ### The Learning Programme
>
> *The programme demonstrates fitness for purpose in terms of mission, relevance, curriculum, pedagogy, intended learning outcomes and assessment.*

Indicator 1.1: The Academic Planning Framework

There is a clear academic planning framework for the programme, reflected in clear aims which relate to the mission and strategic goals of the institution and the college.

Judgment: *Partially Addressed*

- The University of Bahrain (UoB) has policies and processes in place that define its requirements for the approval, structure, content, delivery and outcomes of academic programmes. The Bachelor of Science in Biology programme is offered by UoB's College of Science (CoS) since 1978. There are no licensing requirements or professional standards in place for biologists in Bahrain, but external recognition of the Bachelor of Science in Biology has been sought and gained in 2020, through accreditation of the programme by the 'Accreditation Agency for Study Programmes in Engineering, Informatics, Natural Sciences and Mathematics' (ASIIN) as aligned to Level 6 of the European Qualifications Framework for Life-long Learning. The University has been active in seeking the views of stakeholders on the extent to which the Bachelor of Science in Biology programme meets their expectations and needs.

- The Self-Evaluation Report (SER) refers to an undated risk register for the Bachelor of Science in Biology programme which includes identification of mitigation measures, responsibilities, and actions taken. It states that primary risks are insufficient academic staffing, too limited laboratory resources and very high attrition/non progression rates. However, the register does not address all these risks or identify the process for risk assessment. The committees Terms of Reference (ToRs) of 2019 does not identify any committee with responsibility for review of risk assessments and progress in mitigation. Therefore, the Panel recommends that the University should develop and identify a policy and process for programme risk management and suggests that this should include oversight at college level. Also, the Panel recommends that the College should review and revise its Bachelor of Science in Biology programme risk assessment to accurately define the risks faced by the programme.

- The Bachelor of Science in Biology was placed at Level 8 of the National Qualification Framework (NQF) in 2018 and the Panel confirms that the programme largely meets the expectations of the NQF. However, the area of least alignment with the NQF is with the requirements of domain 5 (Competence: Autonomy, Responsibility & Context) that graduates must have competency to 'Operate at a specialist level; in variable contexts that have some unpredictability; in defined and undefined areas of work; with significant responsibility for the work of others; lead multiple groups and projects with decision making responsibilities'. Therefore, the Panel recommends that the College should introduce mechanisms to provide the opportunity to students to develop competence in significant responsibility for the work of others, and to lead multiple groups and projects with decision making responsibilities and assesses the students' achievement of these competencies.

- The programme title 'Bachelor of Science in Biology' is consistent with international conventions and is accurately documented. It is noted from the use of 'B.Sc. in Biology – Chemistry' in the graduate certificate that both the major and the minor are included but it is not made explicit, in this case, that the latter is the minor. The Panel suggests that the College explicitly identifies minors in its graduation certificates.

- The aims of the programme are clearly and appropriately stated in the form of Programme Educational Objectives (PEOs) and intended learning outcomes. The Panel was provided with evidence from analysis of survey results and from committee minutes to demonstrate that stakeholders are consulted about the aims of the programme and that changes have been made in response to these consultations. The SER does not address how the Bachelor of Science in Biology programme contributes to the achievement of the college and institution strategic goals and does not include statement of these goals. The Panel recommends that the College should identify and review how the Bachelor of Science in Biology programme contributes to the achievement of the college and institution strategic goals.

Indicator 1.2: Graduate Attributes & Intended Learning Outcomes

Graduate attributes are clearly stated in terms of intended learning outcomes for the programme and for each course and these are appropriate for the level of the degree and meet the NQF requirements.

Judgment: *Addressed*

- UoB has defined generic graduate attributes at the institutional level. The Programme Specification includes a mapping of the Programme Intended Learning Outcomes (PILOs) to the PEOs and the institutional-level graduate attributes, demonstrating how the latter have been attained by graduates of the programme.

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- The PILOs are clearly stated, measurable and appropriate for a level 8 qualification. The Department of Biology has been proactive in benchmarking the PILOs against those of other programmes offered by similar institutions and has considered changes to the PILOs as an outcome, most recently in 2022. Course Intended Learning Outcomes (CILOs) are stated in the course syllabus descriptors. The CILOs are appropriate to NQF level and international best practice. The mapping of CILOs to PILOs is identified in the course specifications and this mapping is used to determine the extent to which students have attained the PILOs.

- As a general note, the Panel noticed discrepancies in the programme's structure, course titles, and completion requirements between the Study Plan, university's website, and the Programme Specification. Also, a minor difference in phrasing of PILO 'a' was noted. The Programme Specification identifies that the date of approval or latest modification was in the academic year 2012-2013, this may not represent the most recent approved version. In comparison with the Study Plan, the Programme Specification is less informative as it does not include information on the available electives. The Panel recommends that the College should ensure consistency in the information presented about the programme across all institutional publications and suggests that the Programme Specification is expanded to include more complete information on the available elective courses.

Indicator 1.3: The Curriculum Content

The curriculum is organised to provide academic progression of learning complexity guided by the NQF levels and credits, and it illustrates a balance between knowledge and skills, as well as theory and practice, and meets the norms and standards of the particular academic discipline.

Judgment: *Partially Addressed*

- There is appropriate sequence and progression of courses as shown in the Study Plan. Course pre-requisites are appropriately defined. The programme's curriculum is broadly aligned with international expectations for bachelor's programmes in biology. The 129-credit programme includes 49 credits in the major and 21 credits of major electives that are organised into five areas of specializations. Students can undertake 21 credits from a minor (Chemistry, Computer Science, Statistics, Mathematics, physics, or Astronomy) in which case the major credits are reduced to 43 and the major elective to 12 credits, and these students do not undertake a senior research project unless as an elective. Whereas this structure allows students to gain specialization in a selected sub-field of biology, it also impinges upon the space available in the programme to learn about core subjects. The Panel is of the view that these requirements are minimal by international expectations and also queries the imbalances in the number of credits available for each specialization. Less than a third of the electives were offered in the academic year 2021-2022, and the Panel was informed during interviews that many electives are inactive. The Panel suggests that

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the College reviews the balance of required and elective biology courses and the number of courses available within each elective stream.

- According to the Study Planand course specifications, bioinformatics is only considered in 'Molecular Mechanisms of Bacterial Pathogenesis' (BIOLS 466) course, which is in the Molecular Biology and Genetic Engineering specialization. This is a subject that has come to prominence not only in molecular biology but in many other biological sciences in recent years and should receive consideration irrespective of the students' specializations. Therefore, the Panel recommends that the College should introduce tuition on bioinformatics in the Bachelor of Science in Biology required major courses.

- PILO 'i' is to plan and execute a project based on a scientific method but the senior research project is not a requirement for students who take a minor. Therefore, the Panel recommends that the College should either require all biology major students to undertake a senior research project or amends PILO 'i' of the Bachelor of Science in Biology programme. The Panel also suggests that the College adds a course in research methods and experimental design as a pre- or co-requisite to the senior research project course in the Bachelor of Science in Biology study plan.

- Furthermore, the Panel noted that some components are not covered in the curriculum. While the purpose statements of the University, College and Department place emphasis on entrepreneurship and innovation, there is no apparent instruction in these areas in the curriculum. In respect of achieving PILO 'h' (Integrate ethics and self-development skills throughout the educational and professional life), it is not evident from the course specifications that students receive explicit instruction in ethical frameworks and ethical decision making. It is also not clear where students are assessed on self-development skills. The Panel, hence, recommends that the College should revise the curriculum to include tuition on ethical frameworks and ethical decision making, assessment of students' self-development skills, and entrepreneurship and innovation.

- The Panel is of the view that 129-credit study load for the programme is high. The University adopts common international practice of counting three hours of laboratory contact time as one credit hour. The programme contains substantial laboratory learning (three hours per week for most of the biology major courses) and this, together with the high credit load leads to high contact hours (up to 21 credits and 29 contact hours per semester) are excessive. Current loads are likely to impact on the students' capacity for independent learning. Hence, the Panel advises the College to review the appropriateness of the student study load and makes adjustments to the study plan according to the outcome of the review.

- The Panel was provided with evidence to demonstrate that adjustments has been made to the curriculum as a result of benchmarking. The College has also made changes in order to satisfy the recommendations of the ASIIN report. The Panel concurs with the conclusion

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of the ASIIN accreditation report, which provides that there is an appropriate balance between theory and practice and between knowledge and skills.

- The listing of textbooks in the course specifications that the Panel had access to is generally appropriate to the taught topics but there are several instances where the editions identified are not the current ones. The Panel recommends that the College should review the textbooks specified in the curriculum to ensure that contemporaneous editions are cited, and to add the new editions to the library stock.

Indicator 1.4: Teaching and Learning

The principles and methods used for teaching in the programme support the attainment of programme aims and intended learning outcomes.

Judgment: *Addressed*

- UoB has in place a brief Teaching and Learning Policy (dated 2018) that places a requirement for a range of constructive approaches to teaching and learning that is student-centered, technology-enhanced, and research-informed. In view of the brevity of the policy and the absence of comprehensive guidance on teaching and learning within the policy or subsidiary documents, the Panel suggests that UoB develop more specific guidance on the intended approaches to teaching and learning.

- It is evident from the SER and the course specifications that the teaching and learning methods employed are as to be expected for a biology programme and aligned with the UoB Teaching and Learning Policy. Faculty is supported by the university's E-Learning Center services. A student guide to e-learning is available, but there is no e-learning policy *per se*. The Panel advises the University to develop an e-learning policy.

- The Teaching and Learning Policy emphasizes the interactive nature of teaching and learning and states that students should be empowered to take responsibility of their own learning to develop their lifelong learning skills. The course files include evidence of formal, informal and non-formal learning opportunities.

Indicator 1.5: Assessment Arrangements

Suitable assessment arrangements, which include policies and procedures for assessing students' achievements, are in place and are known to all relevant stakeholders.

Judgment: *Addressed*

- Regulation and guidance on student assessment is provided at the institutional level primarily *via* the Study and Exams Regulations, Assessment Moderation Policy, and Teaching and Learning Policy which are published on the UoB website. The university's regulation of student assessment is covered in the orientation session for new faculty members and the Student Guide includes hyperlinks to the regulations.

- The Study and Exams Regulations and Teaching and Learning Policy require faculty to employ formative student assessments and to provide feedback to students on their assessments. An example of feedback to an individual student on their project report was included with the SER and further evidence of formative assessment is found in the course portfolios. Whereas summative assessments are described in the course specifications, formative assessments are generally not. The Panel advises the College to include specification of formative assessment opportunities in the course specification forms.

- The research-based course is the senior research project. There is no indication in the course specification, grading forms or course portfolios of an expectation for ethical consideration or approval or of consideration of ethics in the evaluation of the research. The Panel was informed by the faculty that most of the projects do not require ethical approval (see recommendation under Indicator 1.3).

- The Assessment Moderation Policy requires moderation of some assessments prior to their implementation in addition to moderation of grading. Evidence is provided that the required procedures are applied for both internal and external moderation of some, but not all, student assessments.

- Policies and procedures are in place to address student misconduct, grievances and appeals through the Study and Exams Regulations, Public Conduct Violations Regulations, and Anti-Plagiarism Policy. Evidence is presented of application of the policy and procedures and students are informed of policies through their open-access publication on the UoB website and the Student Guide.

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Standard 2

Efficiency of the Programme

The programme is efficient in terms of the admitted students, the use of available resources - staffing, infrastructure and student support.

Indicator 2.1: Admitted Students

There are clear admission requirements, which are appropriate for the level and type of the programme, ensuring equal opportunities for both genders, and the profile of admitted students matches the programme aims and available resources.

Judgment: *Partially Addressed*

- The programme adheres to the general admission criteria of UoB, as outlined in Regulations of Study and Examinations document. The admissions criteria are communicated to stakeholders through the university's website and the College Booklet. However, there are inconsistencies in information across these. The Panel suggests that the College review admission criteria for consistency and accuracy where they are made public. As per the admissions data provided for 2020-2021 and student statistics, most students are female; there is no evidence of gender discrimination.

- The Benchmarking Report details benchmarking of admission criteria against six universities. However, the Report did not expose misalignment of the required level of English competence for admission. This is of concern as weak English language skills is repeatedly cited in the course evaluations and the programme has high failure rates. Furthermore, the required level of competence in English is not stated in the admission criteria and the assessment of students' English competence is not benchmarked to an external standardized reference such as IELTS or TOEFL. Therefore, the Panel recommends that the College should set minimum English language grade criteria for admission of students to the programme, and that these are stated as equivalences to internationally-recognized, standardised English assessments such as IELTS and TOEFL.

- According to faculty evaluations of the causes for students' high failure rates, limited ability in English language is a major contributor, indicating that the orientation year is not sufficiently effective. The faculty explained during interviews that this is because the foundation programme focusses on conversational English and does not adequately prepare students in academic and technical English. The Panel recommends that the College should review the effectiveness of the orientation year in preparing students for subsequent learning in courses taught in English.

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- There are arrangements for students to transfer from one academic programme to another within and from another colleges, as well as from other universities. Where students have completed similar content, exemptions from some courses are granted.

Indicator 2.2: Academic Staff

There are clear procedures for the recruitment, induction, appraisal, promotion, and professional development of academic staff, which ensure that staff members are fit-for-purpose and that help in staff retention.

Judgment: *Partially Addressed*

- Procedures for the recruitment, induction, appraisal, and promotion of academic staff are documented in the Academic and Administrative Bylaws, Scholarship Bylaws and Quality Manual. As confirmed to the Panel by a recently appointed faculty member, new recruits in the Department of Biology undergo induction training at the university and college levels and induction presentation slides were provided. The Panel is of the view that the procedures are consistently implemented in a transparent manner.

- The Department of Biology does not have an identified research strategy, though research themes are identified. The Panel suggests that the College develop its research strategy and identify its alignment with the research goals of the College and strategic plan of the University.

- The Department employs 15 full time faculty (one professor, six associate professors, seven assistant professors and one lecturer), supported by two full-time graduate assistants, a part-time assistant professor, a part-time lecturer, and seven technicians. Faculty members are specialized in sub-disciplines that correspond to the elective streams but with variable credentials. There is only one faculty, who does not have a strong research record, specialized in plant science. In view of the need for the Department to deliver six major and up to 36 major elective credits in plant science, the Panel recommends that the College should ensure its readiness, in terms of having enough specialized faculty, to offer the plant science electives.

- As provided in the UoB Faculty Bylaws, faculty work a maximum of 40 hours per week with PhD holders completing up to 12 credit or 15 class hours and non-PhD holders 15 credit or 18 class hours. This was evidenced by faculty teaching load of 2018-2022 and in the Annual Self-Evaluation Report (ASER). However, current (Fall 2022) teaching workload is excessive for 13 of 16 faculty member and there is an average teaching contact, exclusive of senior project supervision, of 19 hours. Understaffing was also identified in the 2017 BQA review and the 2020 ASIIN report. A consequence of this understaffing is that the student to faculty ratio is exceptionally high (57.6:1). None of the faculty receives

relief for research and community engagement duties. The Panel recommends that the College should develop faculty hiring plan and expedite its implementation. The Panel also advises the College to cap enrolment of new students to the programme at a level that ensure that student to faculty ratio is reduced to internationally acceptable limits.

- Professional development is described in the SER and evidence on organisation and participation of the faculty members in a range of relevant conferences and workshops was provided to the Panel. The Panel appreciates the Unit of Teaching Excellence and Leadership's efforts in providing activities such as the Postgraduate Certificate in Academic Practice programme in collaboration with the Higher Education Academy's continuous professional development programmes.

- The SER states that efforts are being made to mitigate the loss of faculty due to retirement by recruiting new faculty members. The Panel is of the view that there are no specific issues with regard to staff retention but suggests that staff retention is monitored more effectively with the use of exit interviews as an example.

Indicator 2.3: Physical and Material Resources

Physical and material resources are adequate in number, space, style and equipment; these include classrooms, teaching halls, laboratories and other study spaces; Information Technology facilities, library and learning resources.

Judgment: *Addressed*

- As confirmed in the tour visit, the Department has 11 dedicated classrooms furnished with IT equipment such as computer and projector. In addition, the Department has four general and eight specialized laboratories. As confirmed by the inventory and during interviews, the laboratories are sparsely equipped to a level that barely meets a threshold level to allow delivery of the programme, and much of the equipment is outdated. It is not evident that there is any policy on replacement of equipment or plans for further development of the laboratory resources, other than the Panel was informed that purchase of some PCR machines was approved three years ago but has been put on hold. The Panel recommends that the University should develop a policy for replacement of laboratory equipment and a plan with associated budget to improve the equipment of the biology laboratories.

- The Information Technology Center (ITC) provides students with email accounts, login credentials into the Student Information System (SIS). Computer laboratories are also available to student. IT technical support to students is provided *via* online workshops. The Panel concludes that IT facilities are appropriate for students' needs.

- The library provides students with access to textbooks and journals in addition to six study rooms. The Panel visited the library during its tour visit and found the study spaces within the library to be limited. The Panel advises the University to consider the expansion of the physical library amenities, to allow more students' access. A spreadsheet was provided evidencing the type and number of textbooks available and during interviews with faculty and students, it was confirmed that the library databases include Science Direct and there is a subscription to the British Library Interlibrary Loans service.

- General maintenance is carried out by the university's Maintenance Department. Maintenance contracts for some of the laboratory resources (Perkin Elmer equipment) were also provided. However, no evidence was provided on how other specialist equipment (e.g. spectrophotometry) is maintained. Thus, the Panel recommends that the University should audit the equipment maintenance needs of the biology laboratories and place maintenance contracts accordingly.

- The SER outlines arrangements to ensure the health and safety of students and staff on campus. Supporting evidence includes an Occupational Health and Safety Programme, Safety Measures, and Laboratory Safety Booklet for students. A safety booklet is issued to students which includes most of the information that would be expected of such a document. The Panel suggests that UoB add contact information for relevant personnel to its safety booklet.

Indicator 2.4: Management Information Systems

There are functioning management information and tracking systems that support the decision-making processes and evaluate the utilisation of laboratories, e-learning and e-resources, along with policies and procedures that ensure security of learners' records and accuracy of results.

Judgment: *Addressed*

- The SER provides details of the use of the SIS for the management of student information, academic records and course evaluation reports, as well as for supporting the decision-making process in terms of student progression, staff appraisal and contract renewal. This was shown to the Panel during the live demonstration of the SIS. Tracking reports on the utilization of laboratories, e-learning facilities, etc., were discussed with senior management during interviews, and the Panel learnt that generated reports from the SIS are utilized to inform decision-making.

- UoB has an ITC Cyber Policies and Procedures document dated 2019 that includes provisions on security of IT systems. The ITC also implements a risk management plan, which calls for regular electronic backup and data recovery. To ensure the integrity, confidentiality, and protection of the students' data, the SIS employs several access

authentication and access control measures. Overall, The Panel notes with appreciation that the institutional policies and procedures provide appropriate provisions on security of IT systems and layers of access to secure students' records and their accuracy.

- A sample Bachelor of Science in Biology transcript was provided. The SER does not discuss the accuracy of transcripts in describing the achieved learning nor the timeliness of their issuance or cite specific policies or procedures to ensure accuracy or issuing of transcripts in a timely manner. However, this was discussed with faculty, students and alumni who confirmed that transcripts are made available promptly and are accurate.

Indicator 2.5: Student Support

There is appropriate student support available in terms of guidance, and care for students including students with special needs, newly admitted and transferred students, and students at risk of academic failure.

Judgment: *Addressed*

- As per the SER, there are seven technicians serving the programme, one technician for every two laboratories. During the tour visit, the Panel noticed that two staff are available to serve at the two-story library, both are positioned on the ground floor. The Panel, thus, advises the University to provide more staff at the library to assist students.

- A career counseling office is available at the University which provides services including professional training and career guidance. Further information through the website states that this office runs annual and specialized career days. The students and alumni confirmed during interviews that career fairs are operated. An induction day is provided by the guidance and Counseling Department of the Deanship of Students' Affairs. Details of additional induction/orientation of new students to the College and the programme were satisfactorily discussed during interviews with faculty and students.

- Academic advising is provided by the faculty. A screen shot of communication between student and advisor was provided along with Academic Advising Regulations. Senior exit surveys of 2017–2021 report advisor timely response from 68.8% to 75.4%. The minimum frequency of academic advising is not discussed but the survey indicates that once per semester is sufficient. The SER and supporting evidence do not specially mention academic advising to support students in achieving graduate attributes and learning outcomes nor is this evaluated in senior exit surveys. However, the students and alumni with whom the Panel met confirmed that advising is adequate.

- The SER does not mention provisions to integrate women's needs or processes to ensure equal opportunities for both genders. The SER discusses support facilities for students

with special needs provided by the Guidance and Counseling Department of the Deanship of Students' Affairs.

- Students at risk of academic failure are identified through the academic advisory programme and SIS. The College identifies 385 at-risk student. The academic advisor, in coordination with the teaching faculty of the relevant courses provide academic advice to at-risk students. This presents a large burden for the number of academic staff which reinforces the need to bring student to faculty ratios down (see Indicator 2.2, paragraph 4). The Panel recommends that the College should investigate the reasons behind the high number of at-risk students and develop effective measures to address them.

- The SER indicates awareness with regards to improvements in support services to students including academic advising; however, it does not discuss or cite additional evidence to indicate that support services are regularly assessed and improved in line with students' needs. Nonetheless, student support services are regularly assessed through surveys.

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Standard 3

Academic Standards of Students and Graduates

The students and graduates of the programme meet academic standards that are compatible with equivalent programmes in Bahrain, regionally and internationally.

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Indicator 3.1: Efficiency of the Assessment

The assessment is effective and aligned with learning outcomes, to ensure attainment of the graduate attributes and academic standards of the programme.

Judgment: *Addressed*

- As shown in the course specifications, students are assessed using a variety of appropriate methods and these are aligned with expected practice for biology programmes. Processes are in place and applied for both internal and external moderation of student assessments to review assessments, and faculty is required to use marking rubrics.

- The alignment of assessments with CILOs and PILOs is evaluated and recorded and the alignment of courses with PILOs, PILOs with PEOs and PILOs with the UILOs is identified in the Programme Specification. Selected student assessments are identified in CILO-PILO Assessment Forms as measures of how well the CILOs have been achieved. There are some examples of these forms (e.g., for BIOLS 232, BIOLS 250 and BIOLS 352), where courses were deemed to have met all of their CILOs despite very high student failure rates. The Panel recommends that the College should review the selection of CILO attainment criteria in the biology courses with particular attention to those courses where CILOs are deemed as met regardless of high student failure rates.

- Whereas there are processes for review of assessment instruments through the moderation process, and the course portfolios include copies of Course Review Forms and CILO-PILO Assessment Forms that require identification of proposed actions/recommendations for course improvement that can include assessment processes, none of these documents require identification of previous recommendations, their implementation or their effectiveness. Therefore, the Panel advises the University to modify its quality reporting forms to include following-up with previous recommendations and ensure their implementation.

Indicator 3.2: Academic Integrity

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Academic integrity is ensured through the consistent implementation of relevant policies and procedures that deter plagiarism and other forms of academic misconduct (e.g. cheating, forging of results, and commissioning others to do the work).

Judgment: *Partially Addressed*

- Policies that relate to academic integrity are included in the Regulations of Study and Examinations and the Regulation of Professional Conduct Violations for Students. The University has also a published Anti-Plagiarism Policy. The SER states that the Anti-Plagiarism Policy is distributed to students during induction and explains invigilation procedures, and evidences application of the procedures.

- Students and faculty confirmed during interviews that similarity indexing software is used. They identified that students are allowed unlimited submissions of their work to the software and a threshold index above which investigation is warranted was identified but not consistently implemented. The Panel recommends that the College should limit the number of times that students can resubmit their work to similarity indexing software and define and communicate guidance on the threshold similarity index above which investigation is warranted.

Indicator 3.3: Internal and External Moderation of Assessment

There are mechanisms in place to measure the effectiveness of the programme's internal and external moderation systems for setting assessment instruments and grading students' achievements.

Judgment: *Addressed*

- The university's approach to internal moderation of student assessment is defined in the Assessment Moderation Policy. There is evidence of moderation in the course files and the Panel is of the view that the choice of internal moderators is appropriate. Evidence is presented in the form of the most recent Moderation Committee Analysis Report dated June 2022, in which both internal and external moderators' observations and suggestions are considered. The Analysis Report includes also consideration of suggestions for improvement.

- External moderators are appointed following formal invitation as per the expectations of the Assessment Moderation Policy which details the roles and responsibilities of external moderators, but the Policy does not identify threshold criteria for appointment of externals. The Panel suggests that UoB adds threshold criteria for appointment of external moderators to its Assessment Moderation Policy.

- As confirmed by the external moderators during interviews, their appointment is limited to a single occurrence of reviewing a course, and they are unaware of any intention to re-

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employ. It would be beneficial for the University to establish a longer-term relationship with the external moderators, allowing a longitudinal review of quality improvements. The Panel suggests that UoB contracts its external moderators for a longer period (e.g three to five years).

- The external moderators confirmed to the Panel that they received no feedback on the actions taken in response to their reports. The Panel, hence, suggests that the College provides external moderators with feedback on their suggestions. The SER is silent on processes for evaluation of the effectiveness of the programme's internal and external moderation processes. The Panel recommends that the College should put in place a process to evaluate the effectiveness of its internal and external moderation processes.

Indicator 3.4: Work-based Learning

Where assessed work-based learning takes place, there is a policy and procedures to manage the process and its assessment, to assure that the learning experience is appropriate in terms of content and level for meeting the intended learning outcomes.

Judgment: *Partially Addressed*

- The compulsory Internship course is a positive feature of the programme that provides work-based learning and contributes effectively to attainment of the PILOs. The SER claims that there is a clear policy for the assessment of work-based learning courses and references the Teaching and Learning Policy, Regulations of Study and Examination, and the Quality Manual. However, these documents deal with generic aspects of the management of teaching, learning and student assessment and they do not explicitly address the specific needs of work-based learning. The University publishes brief internship guidelines that identifies roles and responsibilities of each party involved in the internship, but this does not adequately address the Quality Assurance (QA) and management of the work-based learning course. The Panel recommends that the University should develop clear policy and procedures to manage, and quality assure the work-based learning process.

- According to the Study Plan, work-based learning is incorporated into the Bachelor of Science in Biology programme *via* the 'Internship' (BIOLS 398) course that has a prerequisite of completion of 75 credit hours and is allocated one credit hour. The list of internship providers shows that students are placed in institutions where they will be exposed to relevant practice. The alumni were extremely positive, during interviews, about the contribution of the internships to the programme and to their personal development.

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- The assessment of students in the internship course is specified in the course description, and examples of student work and completed supervisor assessment forms were provided. The examples of assessment support that the student assessment is appropriate in terms of content and level and that the assessment is implemented as per specification.

- The evaluation of the effectiveness of the work-based learning does not extend to solicitation of student feedback on their experience in the student/graduate/alumni surveys, and the Panel notes that, in contrast to other courses of the programme, the Internship is not considered in the course evaluation section of the most recent Bachelor of Science in Biology ASER. The Panel, hence, recommends that the College should routinely include consideration of the Internship course in its annual evaluation of the effectiveness of the Bachelor of Science in Biology programme and suggests that the College develops student and placement provider surveys to inform evaluation of the effectiveness of work-based learning courses.

Indicator 3.5: Capstone Project or Thesis/Dissertation Component

Where there is a capstone project or thesis/dissertation component, there are clear policies and procedures for supervision and evaluation which state the responsibilities and duties of both the supervisor and students, and there is a mechanism to monitor the related implementations and improvements.

Judgment: *Addressed*

- The 'Senior Research Project' (BIOLS 499) course is a three-credit hours course, which students can register after completing 60 credit hours. The Course Syllabi includes clear CILOs that are appropriately phrased and mapped to the PILOs. The SER summarizes supervisor roles and states that there is relevant policy but does not evidence the policy. It is a common practice to include this type of information, as well as other information for students such as thesis format and assessment instructions in a thesis handbook but the University does not publish such a document for undergraduate students. The Panel recommends that the University should publish policy and guidance on the roles and responsibilities of the supervisors and communicate them to all stakeholders and suggests that this is incorporated into a thesis/senior research project handbook.

- The responsibilities of the supervisor as articulated in the SER include monitoring of the student's progress. Satisfaction of the student with supervisory process and resources is evaluated, at least indirectly, *via* some of the questions posed in the Student Exit Survey. Alumni and faculty confirmed, during interviews, the faculty commitment to training students in the laboratories as substantially contributing to the quality of the senior project and very limited laboratory resources (see Indicator 2.3) as the aspect most in need of improvement.

- The assessment methods are defined in the Course Syllabi and appropriately include assessment by the supervisor and a second marker together with consideration of the grading by an examining committee. The SER identifies that the same processes are applied to the 'Senior Research Project' (BIOLS 499) course as to other courses to evaluate the effectiveness of the course and its contribution to the achievement of the programme aims. The Panel refers to its recommendation on these processes under Indicator 3.1.

Indicator 3.6: Achievements of the Graduates

The achievements of the graduates are consonant with those achieved on equivalent programmes as expressed in their assessed work, rates of progression and first destinations.

Judgment: *Partially Addressed*

- The Panel initially had very little access to examples of student work, limited to a case study, article summary, internship and senior research project reports but was later granted more access *via* the course portfolios. The Panel is satisfied from consideration of these evidence, along with the evaluation of the processes in place to ensure alignment of student assessment with CILOs and PILOs, and from the moderation of assessments, that the level of students' achievements is appropriate based on careful scrutiny of students' assessed work.

- The proportion of students graduating on time is exceptionally low by international standards and has been reported on previously in the 2017 BQA review report. The average new student admissions to the programme over the last five years has been relatively constant, averaging 208.8 per annum but the average number graduating over this period has been 36.2 per annum. Action has been taken in part to address student preparedness by introduction of a 32-credit orientation programme that includes substantial tuition in English language. Given how low the graduation rates are, the Panel recommends that the College should undertake rigorous analysis and review of the progression and achievement statistics of the programme and develop a time-limited action plan to address identified causes of poor progression and completion rates.

- The University regularly deploys Graduate and Employer Surveys and there is an appropriately constituted Programme Advisory Committee (PAC) with published minutes, and evidence is presented of discussion of the evaluation of the surveys and committee minutes within the Department. The main concern of the employers that that the Panel interviewed was lack of exposure of students to modern laboratory equipment and techniques (see earlier discussion in Indicator 2.3).

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Standard 4

Effectiveness of Quality Management and Assurance

The arrangements in place for managing the programme, including quality assurance and continuous improvement, contribute to giving confidence in the programme.

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Indicator 4.1: Quality Assurance Management

There is a clear quality assurance management system, in relation to the programme that ensures the institution's policies, procedures and regulations are applied effectively and consistently.

Judgment: *Addressed*

- There are appropriate institutional policies and regulations for QA processes that are described in the Quality Manual, and the Quality Assurance and Enhancement Policy. The Manual is available at UoB website and well communicated to stakeholders.

- At the college level, the College Quality Assurance Committee, with clear ToRs, monitors the QA compliance, assessment, and accreditation activities. At the programme level, the departmental Quality Assurance Committee is responsible for all QA matters related to the programme. In addition, there is a College Quality Assurance Office, which is managed by a director who reports directly to the Dean and the Quality Assurance and Accreditation Executive Committee.

- Based on interviews with faculty members and supporting staff, the Panel finds that the programme faculty have sound understanding of the QA system and their role in ensuring its effectiveness. However, no sufficient evidence was provided to demonstrate that UoB policies and procedures are consistently implemented at the programme level. The Panel recommends that the College should ensure that the university's policies and procedures are consistently implemented at the programme level.

- The Panel was informed, during interviews, that the QA processes are periodically evaluated and improved. This includes internal audits as per the Internal Quality Review Policy and Procedures. However, no sufficient evidence was provided to demonstrate that these audits are conducted on a regular basis and that the overall effectiveness of the QA system has been evaluated. The Panel recommends that the University should monitor, evaluate and improve the QA management system at the programme level.

Indicator 4.2: Programme Management and Leadership

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The programme is managed in a way that demonstrates effective and responsible leadership and there are clear lines of accountability.

Judgment: *Addressed*

- The College has an appropriate organizational chart for the management of the programme, with clear reporting lines that support communication and decision-making across the College. The programme is managed by the Head of the Department (HoD). The responsibility at each level is well defined and monitored. Based on this and as evident from interviews with Dean, HoD and faculty, the Panel is satisfied that the committees at various levels operate according to their well-defined ToRs.

- Responsibility and custodianship of the academic standards of the programme at the different levels: Department, College, and University, as well as the ToRs for all committees and the job descriptions for senior leadership positions are described in the Quality Manual. Different academic and administrative responsibilities are assigned to various committees in the Department, who report to the HoD and therefore, the overall responsibility for the management of the programme is spearheaded by the HoD, who is also tasked with managing/conducting the faculty appraisals. Based on interviews, the Panel is satisfied that the current management of the programme is appropriately demonstrating effective leadership, and that clear lines of accountability exist.

Indicator 4.3: Annual and Periodic Review of the Programme

There are arrangements for annual internal evaluation and periodic reviews of the programme that incorporate both internal and external feedback and mechanisms are in place to implement recommendations for improvement.

Judgment: *Partially Addressed*

- The Panel examined the ASER of the programme of 2020-2021, which is prepared by the departmental Quality Assurance Committee and found that it is based on multiple sources of information such as PILOs assessment reports, college courses evaluation reports, moderation reports and surveys. The Panel notes that the ASER includes a section for remediation actions; however, little information is provided on the actions that have been implemented to address areas of concern, and in some cases, deadlines have been exceeded with no documentation of actions taken. There is minuting of Departmental Council consideration of follow up on the ASER but this lacks rigour, failing for example to identify what has or has not been completed, or assessing the effectiveness of any corrective measures. Therefore, the Panel observes that follow up on the implementation and effectiveness of the ASER outcomes is lacking. It is of concern, also, that the ASER does not take into account resulting feedback on PILOs' assessment, student progression,

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retention, and graduation rates, and does not include any corrective measures that address this.

- Some improvements emanating from PAC recommendations have been put to action. The Student Advisory Committee (SAC) has also recommended some amendment to the programme (content, assignments, assessments, electives, internship); these have been suggested and discussed in relevant evidence; however, there were no clear changes implemented, nor were there any progress reports presented. ASERs were provided for 2018-2019 and 2020-2021 but not for other academic years and this leads to concern about the regularity of conducting annual reviews for the programme. Hence, the Panel recommends that the College should ensure that annual review of the programme is conducted regularly; the process of implementing the action items is properly monitored and that the evaluation of the whole process of the annual review of the programme is monitored for effectiveness.

- The policy for the annual and periodic reviews of programmes is stipulated in the Quality Assurance and Enhancement Policy. As per provided evidence, the Bachelor of Science in Biology was reviewed by the BQA in 2017, and by ASIIN in 2019, in addition to an internal audit review by UoB; however, the SER does not identify follow-up on any of the BQA and internal audit reports. Given that the periodic review should be conducted as an internal process, the Panel recommends that the College should ensure that periodic review of the programme takes place on a regular basis, and that the results of this review are implemented and monitored. The Panel also recommends that the College should implement the BQA and ASIIN reviews' recommendations.

Indicator 4.4: Benchmarking and Surveys

Benchmarking studies and the structured comments collected from stakeholders' surveys are analysed and the outcomes are used to inform decisions on programmes and are made available to the stakeholders.

Judgment: *Addressed*

- UoB has a benchmarking policy as part of its programme QA process. The PILOs were benchmarked against those of other programmes offered by institutions in the United States, United Kingdom, Pakistan and the West Indies and has considered changes to the PILOs as an outcome of the benchmarking exercise, most recently in 2022. Although the SER provides benchmarking of the programme structure/curriculum and intended outcomes, it does not provide any comparison of year-on-year progression, retention, length of study and graduate destinations with those of comparable programmes at the national, regional or international level. This was confirmed during interviews. Thus, the Panel suggests to include the abovementioned aspects in the benchmarking activities.

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- The Panel confirmed that there are formal mechanisms for collecting structured comments from internal and external stakeholders (surveys, focus groups, etc.). Submitted evidence indicate that Student Exit Surveys, Alumni Surveys and Employer Surveys have been deployed to gather stakeholders' input on the Biology programme. Response rates are high for the Student Exit Surveys but low for Alumni (24 of those graduating between 2016 and 2021), and unstated for Employer Surveys. The Panel advises the College to consider how to improve response rates for Alumni and Employer Surveys.

- Although the results of the various surveys were discussed in the Department Council and suggestions on how to address programme weaknesses were discussed too, the Panel was not able to identify whether any steps were taken towards remediation, or if any changes to the curriculum were implemented accordingly. While the SER is silent on how changes to the programme are communicated to various stakeholders, the Panel was informed during interviews with members of the PAC that such communications took place during PAC meetings. However, the Panel concluded from interviews with various stakeholders that a mechanism to communicate the outcomes to other stakeholders such as alumni and employers is lacking. The Panel recommends that the College should develop a systematic mechanism of communicating to stakeholders the changes or decisions made on the basis of their feedback and set in place a process to evaluate the effectiveness of the mechanism.

Indicator 4.5: Relevance to Labour Market and Societal Needs

The programme has a functioning advisory board and there is continuous scoping of the labour market and the national and societal needs, where appropriate for the programme type, to ensure the relevancy and currency of the programme.

Judgment: *Partially Addressed*

- The PAC is made up of employers and members of the private sector, with clear ToRs that regulate and guide the duties of its members. Provided evidence indicates that meetings of PAC take place, in which updates on the programme are shared and discussed. Through virtual interviews with PAC members, the Panel was able to confirm that the PAC members are invited to meet with college constituents to discuss the programme and its outcomes, regularly. The PAC's suggestions are discussed in the Departmental Council and responsibility assigned to follow up on these but there is generally no record of the Departmental Council reviewing whether the proposed changes having been implemented or their evaluation in the context of better addressing the labour market needs.

- The SER is silent on mechanisms used to monitor and review any evidence concerning how well the programme meets the labour market, and national and societal needs.

Employment of graduates is gleaned from a 2021 Alumni Survey but the survey has low response rate and is not regular, having only been conducted once since 2017. Employers' views are sought *via* an Employer Survey but this too is not regularized. No evidence is presented of any rigorous study, e.g. market survey, to scope the labour market and the national and societal needs, and no formal mechanism is described to evaluate the limited information available from the Alumni and Employer Surveys. Therefore, the Panel recommends that the College should conduct a formal study with targeted data to scope the labour market and the national and societal needs to ensure that the programme is relevant and up to date. As described in the previous paragraph, there are regular PAC meetings but follow up on PAC suggestions is limited to PAC meetings and the evaluation of their implementation and effectiveness is not consistently considered by the Departmental Council or the ASER. Hence, the Panel recommends that the College should review and evaluate the mechanisms used to ensure that the programme meets labour market and societal needs.

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V. Conclusion

Taking into account the institution's own self-evaluation report, the evidence gathered from the interviews and documentation made available during the virtual site visit, the Panel draws the following conclusion in accordance with the DHR/BQA *Academic Programme Reviews (Cycle 2) Handbook, 2020*:

There is Confidence in the Bachelor of Science in Biology of College of Science offered by the University of Bahrain.

In coming to its conclusion regarding the four Standards, the Panel notes, *with appreciation*, **the following:**

1   The Unit of Teaching Excellence and Leadership's efforts in providing activities such as the Postgraduate Certificate in Academic Practice programme in collaboration with the Higher Education Academy's continuous professional development programmes.

2   The institutional policies and procedures provide appropriate provisions on security of Information Technology systems and layers of access to secure students' records and their accuracy.

In terms of improvement, the Panel recommends that the University of Bahrain should:

1   Develop and identify a policy and process for programme risk management and suggests that this should include oversight at college level.

2   Review and revise its Bachelor of Science in Biology programme risk assessment to accurately define the risks faced by the programme.

3   Introduce mechanisms to provide the opportunity to students to develop competence in significant responsibility for the work of others, and to lead multiple groups and projects with decision making responsibilities and assesses the students' achievement of these competencies.

4   Identify and review how the Bachelor of Science in Biology programme contributes to the achievement of the college and institution strategic goals.

5   Ensure consistency in the information presented about the programme across all institutional publications.

6   Introduce tuition on bioinformatics in the Bachelor of Science in Biology required major courses.

7   Either require all biology major students to undertake a senior research project or amends PILO 'i' of the Bachelor of Science in Biology programme.

8   Revise the curriculum to include tuition on ethical frameworks and ethical decision making, assessment of students' self-development skills, and entrepreneurship and innovation.

9   Review the textbooks specified in the curriculum to ensure that contemporaneous editions are cited, and to add the new editions to the library stock.

10 Set minimum English language grade criteria for admission of students to the programme, and that these are stated as equivalences to internationally-recognized, standardised English assessments such as IELTS and TOEFL.

11 Review the effectiveness of the orientation year in preparing students for subsequent learning in courses taught in English.

12 Ensure its readiness, in terms of having enough specialized faculty, to offer the plant science electives.

13 Develop faculty hiring plan and expedite its implementation.

14 Develop a policy for replacement of laboratory equipment and a plan with associated budget to improve the equipment of the biology laboratories.

15 Audit the equipment maintenance needs of the biology laboratories and place maintenance contracts accordingly.

16 Investigate the reasons behind the high number of at-risk students and develop effective measures to address them.

17 Review the selection of CILO attainment criteria in the biology courses with particular attention to those courses where CILOs are deemed as met regardless of high student failure rates.

18 Limit the number of times that students can resubmit their work to similarity indexing software and define and communicate guidance on the threshold similarity index above which investigation is warranted.

19 Put in place a process to evaluate the effectiveness of its internal and external moderation processes.

20 Develop clear policy and procedures to manage, and quality assure the work-based learning process.

21 Routinely include consideration of the Internship course in its annual evaluation of the effectiveness of the Bachelor of Science in Biology programme.

22 Publish policy and guidance on the roles and responsibilities of the supervisors and communicate them to all stakeholders.

23 Undertake rigorous analysis and review of the progression and achievement statistics of the programme and develop a time-limited action plan to address identified causes of poor progression and completion rates.

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24 Ensure that the university's policies and procedures are consistently implemented at the programme level.

25 Monitor, evaluate and improve the QA management system at the programme level.

26 Ensure that annual review of the programme is conducted regularly; the process of implementing the action items is properly monitored and that the evaluation of the whole process of the annual review of the programme is monitored for effectiveness.

27 Ensure that periodic review of the programme takes place on a regular basis, and that the results of this review are implemented and monitored.

28 Implement the BQA and ASIIN reviews' recommendations.

29 Develop a systematic mechanism of communicating to stakeholders the changes or decisions made on the basis of their feedback and set in place a process to evaluate the effectiveness of the mechanism.

30 Conduct a formal study with targeted data to scope the labour market and the national and societal needs to ensure that the programme is relevant and up to date.

31 Review and evaluate the mechanisms used to ensure that the programme meets labour market and societal needs.