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

Directorate of Higher Education Reviews

Programmes-within-College Reviews Report

B.Sc. in Physics

College of Science

University of Bahrain

Kingdom of Bahrain

Date of the Review: 12-16 March 2017

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Acronyms

ASIIN	Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik - German accreditation body
BSPH	B.Sc. in Physics
BQA	Education & Training Quality Authority
CILO	Course Intended Learning Outcome
DAC	Department Quality Assurance Committee
DHR	Directorate of Higher Education Reviews
CGPA	Cumulative Grade Point Average
ILO	Intended Learning Outcome
HEC	Higher Education Council of the Ministry of Education, Kingdom of Bahrain
MIS	Management Information System
NQF	National Qualification Framework
PAC	Professional Advisory Committee
PCAP	Postgraduate Certificate in Academic Practice
PEO	Programme Educational Objective
PILO	Programme Intended Learning Outcome
QA	Quality Assurance
QAA	College Quality Assurance and Accreditation Office
QAAC	Quality Assurance and Accreditation Centre
SAC	Student Advisory Committee

SER	Self-Evaluation Report
UILO	University Intended Learning Outcomes
UoB	University of Bahrain

The Programmes-within-College Reviews Process

A. The Programmes-within-College Reviews Framework

To meet the need to have a robust external quality assurance system in the Kingdom of Bahrain, the Directorate of Higher Education Reviews (DHR) of the Education & Training Quality Authority (BQA) has developed and is implementing two external quality review processes, namely: Institutional Reviews and Programmes-within-College Reviews which together will give confidence in Bahrain's higher education system nationally, regionally and internationally.

Programmes-within-College Reviews have three main objectives:

- to provide decision-makers (in the higher education institutions, the BQA, the Higher Education Council (HEC), students and their families, prospective employers of graduates and other stakeholders) with evidence-based judgements on the quality of learning programmes
- to support the development of internal quality assurance processes with information on emerging good practices and challenges, evaluative comments and continuing improvement
- to enhance the reputation of Bahrain's higher education regionally and internationally.

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

Indicator 1: **The Learning Programme**

The programme demonstrates fitness for purpose in terms of mission, relevance, curriculum, pedagogy, intended learning outcomes and assessment.

Indicator 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 3: **Academic Standards of the Graduates**

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

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

The arrangements in place for managing the programme, including quality assurance, give confidence in the programme.

The Review Panel (hereinafter referred to as 'the Panel') states in the Review Report whether the programme satisfies each Indicator. If the programme satisfies all four Indicators, the concluding statement will say that there is 'confidence' in the programme.

If two or three Indicators are satisfied, including Indicator 1, the programme will receive a 'limited confidence' judgement. If one or no Indicator is satisfied, or Indicator 1 is not satisfied, the judgement will be 'no confidence', as shown in Table 1 below.

Table 1: Criteria for Judgements

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

B. The Programmes-within-College Reviews Process at the University of Bahrain

A Programmes-within-College review of five programmes offered by College of Science at the University of Bahrain (UoB) was conducted by the DHR of the BQA in terms of its mandate to review the quality of higher education in Bahrain. The site visit took place on 12-16 March 2017 for five academic programmes offered by the College, these are B.Sc. in Biology, B.Sc. in Chemistry, B.Sc. in Mathematics, B.Sc. in Statistics and Operational Research and B.Sc. in Physics.

UoB was notified by the DHR/BQA on 13 October 2016 that it would be subject to a Programmes-within-College reviews of programmes offered by the College of Science with the site visit-taking place in March 2017. In preparation for the review, the College of Science at UoB conducted self-evaluation of these programmes and submitted the Self-Evaluation Reports (SERs) with appendices on 25 December 2016.

The DHR constituted a panel consisting of experts in the academic fields of the programmes under review and in higher education who have experience of external programme quality reviews. The Panel comprised 10 reviewers.

This Report provides an account of the review process and the findings of the Panel for the B.Sc. in Physics based on:

(i) analysis of the Self-Evaluation Report and supporting materials submitted by the institution prior to the external peer-review visit

(ii) analysis derived from discussions with various stakeholders (faculty members, students, graduates and employers)
(iii) analysis based on additional documentation requested and presented to the Panel during the site visit.

It is expected that the UoB will use the findings presented in this Report to strengthen its B.Sc. in Physics programme. The DHR recognizes that quality assurance is the responsibility of the higher education institution itself. Hence, it is the right of UoB to decide how it will address the recommendations contained in the Review Report. Nevertheless, three months after the publication of this Report, UoB is required to submit to the DHR an improvement plan in response to the recommendations.

The DHR would like to extend its thanks to UoB for the co-operative manner in which it has participated in the Programmes-within-College review process. It also wishes to express its appreciation for the open discussions held in the course of the review and the professional conduct of the academic and administrative staff of the Department of Physics.

C. Overview of the College of Science

The College of Science, at UoB, was originally established as a part of the University College of Science, Art and Education, which was founded by the Amiri Decree number 11 in 1978. In 1986, Amiri Decree No. (12) was issued to establish the University of Bahrain by a merger of the Gulf Polytechnic and the University College of Science, Art and Education. In 1990, the Board of Trustees of UoB issued a decision to divide the College of Arts & Science into two separate colleges: The College of Arts and the College of Science. Currently, the College of Science under the UoB has four academic science departments: the Department of Biology, Chemistry, Mathematics, and Physics. These departments offer undergraduate programmes of study in natural sciences that lead to Bachelor of Science (B.Sc.) qualifications as well as Master of Science programmes. At the time of the site visit, the College was employing 83 faculty members, including five part-time, and 58 administrative staff. The total number of enrolled students was 1,165 students.

D. Overview of the Bachelor of Science in Physics

The Department of Physics in the College of Science at the University of Bahrain currently offers the four year B.Sc. in Physics programme at Sakhair campus. The programme originally started in 1978, in one of the four departments of the University College of Arts, Science and Education, and in 1986 the programme continued under UoB. The first batch of students enrolled in the programme was in the year 1978 and at the time of the site visit, the total number of students enrolled in the programme was 65. Currently, there are 17 full-time faculty members, supported by 16

administrative staff contributing to the delivery of the programme. The programme has not been subjected to professional accreditation yet. However, the College is in the process of undertaking quality accreditation for all programmes offered by the College of Science through the German accreditation body 'Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik' (ASIIN).

E. Summary of Review Judgements

Table 2: Summary of Review Judgements for the B.Sc. in Physics

Indicator	Judgement
1: The Learning Programme	Satisfies
2: Efficiency of the Programme	Satisfies
3: Academic Standards of the Graduates	Satisfies
4: Effectiveness of Quality Management and Assurance	Satisfies
Overall Judgement	**Confidence**

1. Indicator 1: The Learning Programme

The programme demonstrates fitness for purpose in terms of mission, relevance, curriculum, pedagogy, intended learning outcomes and assessment.

1.1 UoB has a clear planning framework for the Bachelor of Science in Physics (BSPH) programme that is defined in the 'Regulations for Offering/Developing Academic Programmes and Courses at the UoB' document, which was approved on 23 October 2013. The document explains the details of the programme development, monitoring, enhancement, modification, and periodic reviews. Moreover, the programme has clearly stated Programme Educational Objectives (PEOs) that aims at producing 'graduates who can pursue a successful career in a physics related field, qualify for graduate studies, be engaged in life-long learning, exhibit ethical and scientific conduct and contribute positively to society'. The PEOs are comprehensively mapped to the Department of Physics' mission, the College of Science's mission and the university's mission. Furthermore, the Programme Intended Learning Outcomes (PILOs) are mapped to the university's Strategic Goals. This process clearly indicates that all aspects of the missions and goals are addressed by the objectives of this programme. Evidence provided show that these PEOs and mapping have been discussed by the Department Council and different approval bodies. The Panel appreciates that the programme aims, expressed in the term of PEOs, are appropriate for the degree and type of the programme and are aligned to the mission and goals of the Department, College and the University.

1.2 The programme requires the students to complete 128 credit hours, typically over four-year period. The curriculum comprises courses associated with 11 credit hours for university requirement and 9 credit hours of general electives. College requirements comprises seven mainly fundamental science and English language courses (24 credit hours), higher level college requirements (4 more advanced chemistry and mathematics, 14 credit hours). In addition programme compulsory requirement includes 17 compulsory courses (49 credit hours) and seven specialised elective courses (21 credit hours). Moreover, there is a study plan that indicates the expected sequence of courses across semesters, which provides a very uniform workload for the students. This plan follows a logical sequence of introductory courses acting as prerequisites leading to more advanced courses, which facilitate a year-on-year and a course-by-course progression. The Panel appreciates that there is a well-designed study plan and pre-request list for the programme that provides year-on-year and course-by-course progression and suitable workloads for students. The Panel studied the curriculum provided and notes that the compulsory courses offer a broad and appropriate coverage of the key areas of physics with content outlines consistent with similar degrees at institutions internationally, while the electives offer a very broad range of possible special interest topics. Furthermore, interviewed faculty

explained how the balance between theory and practice is achieved where in most courses, the lecture component reflects the theory aspects and the laboratory reflects the practical skills component. The Panel was informed that the skills students are expected to acquire include computational, practical, analytical and communication skills. The Panel confirms that these skills are appropriate for a degree of bachelor of science in physics. The Panel appreciates the well organised and logical curriculum developed for the BSPH programme that provides a balance between theory and practice and knowledge and skills.

1.3 The specification of each course within the BSPH programme is documented using a standard template that provides relevant information on the Course Intended Learning Outcomes (CILOs), content, textbooks, weekly topic schedule, and the assessment methods. There is a wide range of topics covered by these courses proving appropriate breadth of content and delivers a strong sequence of compulsory courses that provides the appropriate depth. Moreover, the textbooks used for these courses are appropriate and current. Nonetheless, the Panel is concerned that there are too many courses and that there are too many electives which are not aligned with possible professions for the graduates. This concern arises from the small enrolment in the programme and the high proportion of students in the current cohort who intend to follow a future career in education. Furthermore, the Panel notes, on the basis of the benchmarking of courses done by the College with the courses of other programmes in the USA, that there are more compulsory and elective courses in the BSPH programme than in those of the benchmarked programmes. The Panel was informed in interviews that there is an intention to identify a wider range of employment opportunities for physics graduates in Bahrain and bring this to the attention of current secondary school students. This process will have a greater impact if at the same time the courses offered are revised and a set of courses more aligned with the local employment opportunities are developed. The Panel recommends that the College should review the number and content of courses with a goal of developing a programme better aligned with the employment prospects for future graduates.

1.4 The BSPH programme has 11 PILOs (a-k), which are divided into four categories of knowledge and understanding, subject-specific skills, thinking skills and general and transferable skills and are accessible by students and staff. The SER states that programme adopted the outcome based approach as outlined in the university's Quality Assurance Handbook 'IDEAS', where the PILOs were first developed in 2009 and then reviewed and modified by the department's Quality Assurance Committee and approved and adopted by the Department Council in the second semester of the academic year 2016-2017. The Panel studied the PILOs and notes that these are suitable for the type and level of the programme. Moreover, the PILOs are clearly mapped against the PEOs and the University Intended Learning Outcomes (UILOs). During meetings with faculty members, the Panel confirmed that faculty members are aware

of the defined PILOs and their role in delivery and ensuring their achievement. Moreover, the PILOs are available to students. The Panel appreciates that the PILOs are clearly stated, suitable for the type and the level of the programme, aligned to the programme objectives and UILOs and subject to reviews.

1.5 There is a set of CILOs assigned to each course within the BSPH programme that are stipulated in the course specification documents. The Panel studied a wide sample of the course specifications and notes that the CILOs are in general, well-written, measurable and suitable for the content and level of the course. Moreover, both the courses as a whole and the CILOs are mapped to the PILOs though a matrix revealing that the compulsory courses cover all the learning outcomes. A separate matrix outlines how the CILOs of the elective courses contribute to the further achievement of the PILOs. Moreover, students are provided with the course specifications, which include the CILOs, at the beginning of each semester, which was confirmed by students the Panel met with during the site visit. Notwithstanding the above, the Panel is concerned that there are too many learning outcomes assigned to some course (for example courses PHYS 209, 241, 365, 499 have 9-10 CILOs). This places a strong constraint on assessment methods as each learning outcome must be evaluated when it is in a course. Consequently, this increases the workload of both faculty members and students and might lead to over mapping of courses to PILOs as evident in the summery of the mapping of compulsory courses to the PILOs and hence to over assessment. Therefore, the Panel recommends that the College should revise the number of CILOs associated to each course to ensure that they are all of reasonable number and eliminate over assessment.

1.6 The BSPH programme includes a work-based learning component in the form of a compulsory course (PHYS 399) which has clearly stated CILOs that address almost all the PILOs. Interviewed staff informed the Panel that the internship provides student with a good perspective of future employment expectations and opportunities. Students are expected to enrol in this course during the summer session between year three and year four of the programme and the only pre-request for the course is the completion of 75 credit hours. Moreover, the assessment policy for this course as stipulated in the course specification, involves a report from the industry supervisor, reports by the supervising academic during two visits, and a short report submitted by the student, at the end of the internship period, about the activities undertaken and the knowledge gained. In Panel discussions with employers, they expressed support for the programme and were highly satisfied with the knowledge and ability of the students they had worked with. There were a few issues with some of the characteristics of the students but they were more an issue related to their personality rather than their training. The students were equally supportive of this course and from their description of their experience, it is clear that the internship contributes to the achievement of the PILOs and that these students were more aware of alternative

career options. The Panel appreciates that the programme includes a work-based learning component that clearly states how it contributes to the achievement of the PILOs. Nonetheless, the Panel notes that, as this course is compulsory and contributes to student learning, there should be credit hours assigned for student's participation. Therefore, the Panel recommends that the College should revise the internship course and allocate credits to it that represent a weight appropriate to the amount of learning achieved by the students.

1.7 There is an institutional teaching and learning policy that is currently undergoing formal approval. The policy provides a general guidance into the teaching and learning modalities to be adopted by the programmes offered in UoB. Moreover, specific teaching and learning methods used for the delivery of each course are outlined in the course specifications and are linked to the relevant CILOs. Although the SER claims that faculty members use interactive teaching, problem-solving learning, case-based learning, group-work learning and e-learning and there is evidence of some courses adopting these methods as evident in the provided sample of course files, teaching and learning methods are in general of more traditional forms of lectures, tutorials, laboratories and computer laboratories. In only one course outline was group discussion listed as a teaching method. The Panel heard in meetings with faculty that a few members have adopted newer and broader approaches to teaching and learning methods and several members outlined the approaches they adopt. However, this was not evident in the course outlines reviewed. Moreover, students interviewed during the site visit confirmed that a limited approach of teaching methods are adopted by the faculty members in delivering the courses. Hence, the Panel recommends that the College should review all course specifications to ensure that these include detailed teaching and learning methods that are suitable for the delivery of the course and its CILOs and develop a monitoring system to ensure consistency of implementation. Furthermore, the use of e-learning is largely limited to relying on 'Blackboard' which can be utilised over a range of levels from the basic communication and storage of course documents to higher levels of online assessment, assignment submission, 'Turnitin' submission and interactive learning. While a few faculty members utilise the higher levels of 'Blackboard', most use it at its most basic level and many do not use it at all. The report from the e-learning centre identifies only 10 courses in physics that use 'Blackboard'. Moreover, although the Department of Physics is acknowledged for being the most research productive department in 2016, it is unclear how this research strength is included formally into the current curriculum other than in the most senior years, where some of these courses include activities that requires students to conduct research activities and a few course materials are informed by current research findings. Furthermore, there is only limited evidence that the teaching methods are informed by professional practices and published research findings. Hence, the Panel recommends that the College should ensure that teaching is informed by current research finding and that the available learning

management system is utilised by the programme in a more consistent and ubiquitous manner.

1.8 The SER states that the Department of Physics follows the university's assessment policies and procedures as stipulated in the 'Regulations of Study and Examinations at the University of Bahrain' document as well as the information included in the 'IDEA' document on outcome based assessment methods produced by UoB's Quality Assurance & Accreditation Committee (QAAC) to guide assessment processes. Both documents are on the university website and are available to faculty and students, which was confirmed by interviews conducted during the site visit. Interviewed faculty members indicated that assessment practices are driven from these documents and the assessment tools are mapped to CILOs. Moreover, the Course Syllabus Form, which is made available to the students at the beginning of the semester, specifies the various components of assessment and their weights. Evidence provided indicates that students' performance is assessed using formative and summative methods and that the marking in general is managed through rubrics to ensure that the criteria are clear and fairly implemented. The faculty members indicated during meetings with the Panel that marked students' work is typically returned within a week and often quicker. This was uniformly supported by the students in their meetings with the Panel, where they stated that feedback is provided typically within less than a fortnight and in most cases written feedback is also included with the marked assessments. Moreover, Students noted that they have the opportunity to discuss their marks with the concerned faculty and can submit official appeal against their final course grades. Furthermore, there is a plagiarism policy that is made known to students and interviewed students indicated that they are regularly reminded of the plagiarism policy and its consequences. The Panel appreciates that there are clear assessment policies and procedures that faculty and students are well aware of and provide a provision for feedback.

1.9 In coming to its conclusion regarding The Learning Programme, the Panel notes, *with appreciation*, the following:

- The programme aims, expressed in the term of programme educational objectives, are appropriate for the degree and type of the programme and are aligned to the mission and goals of the Department, College and the University.
- There is a well-designed study plan and pre-request list for the programme that provides year-on-year and course-by-course progression and suitable workloads for students.
- A well organised and logical curriculum is developed for the BSPH programme to provide a balance between theory and practice and knowledge and skills.
- The programme intended learning outcomes are clearly stated, suitable for the type and the level of the programme, aligned to the programme objectives and university intended learning outcomes and subject to reviews.

- The programme includes a work-based learning component that clearly states how it contributes to the achievement of the programme intended learning outcomes.
- There are clear assessment policies and procedures that faculty and students are well aware of and provide a provision for feedback.

1.10 In terms of improvement the Panel **recommends** that the College should:

- review the number and content of courses with a goal of developing a programme that is better aligned with the employment prospects for future graduates
- revise the number of intended learning outcomes associated to each course to ensure that they are all of reasonable number and eliminate over assessment
- revise the internship course and allocate credits to it that represent a weight appropriate to the amount of learning achieved by the students
- review all course specifications to ensure that these include detailed teaching and learning methods that are suitable for the delivery of the course and its intended learning outcomes and develop a monitoring system to ensure consistency of implementation
- ensure that the available learning management system is utilised by the programme in a more consistent and ubiquitous manner.

1.11 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **The Learning Programme.**

2. Indicator 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.

2.1 UoB has a clear admission policy that is published in the 'Regulations of Study and Examinations at the University of Bahrain' document and is available on the university website. The university's admission requirements include a secondary school certificate with a minimum Cumulative Grade Point Average (CGPA) of 70% or equivalent and proven English proficiency. In addition, applicants are requested to set an aptitude test and an interview. The website also lists the equivalent certificates accepted by the university and the college's specific requirements. Transfer students are also admitted to the programme and for exemptions to be considered for previously taken equivalent courses, a minimum grade of (C+) is required. Interviewed staff and students were well-aware of these policies and procedures. The Panel acknowledges that there is a clear admission policy that is consistently implemented. Notwithstanding the above, the Panel learnt during interview sessions that applicants' high school certificate should not be more than two years old, which precludes admission of students with certificates prior to that period. In particular, this excludes those returning to education after longer periods in the labour market. The Panel suggests that the University revise the criteria to give opportunities for mature students. Moreover, during the site visit, it was clear that the Department of Physics is not involved in the setting of the admission criteria or its revision and interviewed faculty members expressed some concerns about the level of science and mathematics knowledge and skills students entering the programme have. Therefore, the Panel recommends that the College, in collaboration with the University, should revise the admission requirements and include programme specific criteria to assess applicants' capabilities to join the BSPH programme**.**

2.2 The profile of students admitted into the programme indicates that the vast majority of them come from graduates of public secondary schools, science track with the number of female students exceeding the male students. Students who attain 90% or more in the secondary school certificate are exempted from the English language test and those who's English score is below a minimum level, will be admitted to an orientation programme, studying mainly English language for a semester or more. Nonetheless, during interviews with students, the Panel observed cases of limited English communication skills, which would affect students' performance in the programme of study. Furthermore, although students' retention and progression rates are low in the programme (paragraph 3.9), the Panel was not provided with evidence of studies performed to evaluate students' prior basic science and mathematics knowledge versus performance in introductory courses to assess the admission criteria. Hence, the Panel recommends that the College should conduct a thorough

study to identify the reasons behind the low progression and retention rates, and develop a plan to mitigate the issue including a full revision of its requirements for English language, science and mathematics competencies and the structure and content of the orientation programme.

2.3 There are clear lines of accountability with regard to the management of the programme as evidenced in the SER. The department's Chairperson, who manages the programme and its human resources and facilities, reports to the Dean of the College, who reports to the Vice President for Academic Affairs and Graduate Studies and then to the President, and the Department Council, College Council and University Council reflect a corresponding hierarchy. Moreover, the job description and responsibilities of the Chairperson are clearly stipulated in the Quality Manual. During interview sessions, the Panel learnt that various committees are established in the Department at the beginning of the academic year to help the Chairperson in various academic matters and minutes of meetings provided indicate that the committees' recommendations are discussed in the Department Council for approval. The Panel appreciates that there is a formal structure for the management of the programme with clear lines of responsibilities and notes the establishment of department committees to involve faculty members in all academic issues of the programme.

2.4 The Department of Physics employs 15 faculty members with doctoral degrees and two with masters. All faculty members contribute to delivering the programme. The profile of the physics faculty shows qualified faculty members with a range of diverse specializations and experiences. Enrolment in each of the physics specialized courses is less than 20 students. The total number of physics students in the last three years ranges between 70-115 due to the small number of students in each cohort. Statistics provided in the SER indicate that between 11%-15% of the total teaching load in the Department goes back to registrations in physics specialized courses; while, the remaining load is due to the service courses delivered to other programmes offered throughout the different colleges in UoB, resulting in an average teaching load of 17 contact hours per faculty member, which exceeds UoB's regulations. This high teaching load, the Panel notes, has a negative impact on faculty's participation in various professional development activities. For example, the SER indicates that only six faculty members received the Postgraduate Certificate in Academic Practice (PCAP). Therefore, the Panel recommends that the College should develop and implement efficient and balanced strategies to lower teaching loads assigned to faculty members in order to promote professional development pertinent to modern teaching approaches. Nonetheless, evidence provided indicates that, even with this high teaching load, some faculty continue to be active and productive in research, contributing 30% of the overall citable record of the University, and resulting in the

Department receiving the Deanship of Scientific Research award. The Panel notes with appreciation the award-winning research output of the Department of Physics.

2.5 The 'Bylaws of Faculty Members of the University of Bahrain' document encompasses the regulations and procedures for the recruitment, appraisal, promotion and retention of staff. Evidence of minutes of meetings provided to the Panel indicates that, in general, these procedures are implemented in a consistent, fair and transparent manner. The Panel learnt during the site visit that there is an Appointment Committee, consisting of faculty members from the Department, that is responsible for the recruitment of new faculty members and the renewal of the contacts for current expatriate contracts and the extension of service for all faculty members who are above 60 years of age. The Committee reports to the department's Chairperson and its recommendations are discussed by the College Council and University Council for final decision. The Panel appreciates that recruitment procedures are implemented in a transparent manner in alignment with institutional good practices and that faculty members are involved in the recruitment process. During interview sessions with faculty members and senior management, the Panel learnt that there are no formal approaches with regards to the retention of faculty members. However, retention is encouraged through participation in international conferences and incentives as outlined in the SER, and evidence provided indicates stability of academic staffing over the years, which the Panel appreciates. Although there is no formal induction policy, orientation of newly recruited faculty members is done in an informal manner, which the Panel confirmed during the site visit. Therefore, the Panel recommends that the College should implement a formal faculty induction policy for the programme and evaluate its effectiveness. Whilst faculty members are evaluated by students at the end of each semester, formal faculty appraisal is conducted when faculty members apply for promotion or contract renewal only. Hence, the Panel urges the College to revise its appraisal practice (see recommendation under 4.9). Moreover, there is a 'Promotion Regulation Guide' document that stipulates a clear set of criteria which includes research and community service, in addition to teaching and learning activities. The promotion policy and procedures are subject to regular reviews and revisions, last of which was approved by the University Council in 2012. The Panel acknowledges that the document is comprehensive and that the criteria are fair and in line with international standards. Nonetheless, although the research productivity of the Department of Physics is recognized university-wide to be high, the Panel notes that only four out of 17 faculty members are in senior academic ranks and some assistant professors have been in their rank for more than 25 years. Faculty members interviewed during the site visit indicated that this is because the processing of promotion applications is very lengthy and slow. Other faculty members indicated that they are unable to fulfil the current promotion criteria due to the impact of the increased teaching load. The Panel recommends that the College, in collaboration with

the University should evaluate the current promotion system and practice, and develop and implement a mechanism to support its faculty members to get promoted.

2.6 The Panel toured the University Information Technology Centre and was introduced to the functioning Management Information System (MIS) utilised at UoB. The Centre ensures the availability of the system's components to all stakeholders, to support the administration process and to provide appropriate reports to all levels of management for decision-making purposes. In interviews with academic and administrative staff, the Panel learnt that the MIS provides up-to-date information about the students. For example, the Department has access to a wide range of data such as student records, advising records, examination marks, and quality assurance reports. Students interviewed by the Panel confirmed that the system allows them to communicate with the academic advisors and perform online registration and other aspects related to the management of their learning. The Panel notes that access to the MIS is subject to password compliance, whereby staff and students have restricted access to the system *via* a secured login protocol. During interviews, the Panel heard several examples of the use of reports generated by the MIS for decision-making relevant to the programme and its management. The Panel appreciates the functioning MIS that supports faculty members and students and enhances the programme delivery. Nonetheless, there are several identified opportunities for improving the utilisation of the MIS for executive decision-making that were raised during meeting with senior management. During interviews with senior staff, it was noted that the University is in the process of implementing a new MIS that will provide more functionality, and address the areas for improvements in the current system. The Panel encourages the College to expedite the migration to the new MIS.

2.7 The SER states that at the university level, it is the responsibility of the Deanship of Admission and Registration to secure and safeguard all students' related records, in both electronic and hardcopy. At the college level, academic departments are responsible for keeping records of all examinations, project reports, student grades, attendance as well as related policies and procedures. During interview sessions, the Panel learnt that academic staff submit students' grades electronically to the Chairperson, who is responsible for confirming grades and submitting these to the Dean of College, for re-confirmation and submission to the Deanship of Admission and Registration. Applications for changing grades are initiated in the Department and require the Dean and University Council's approvals before being applied. In addition, the Panel notes, from evidence provided and the tour to the IT Centre, that a robust system is in place for the backup and disaster recovery of students' records, with clearly prescribed periods for retention and back-ups. In addition, an electronic backup is conducted every semester by the IT Centre. From its interviews with the staff, the Panel acknowledges that the security of records is ensured through clearly defined mechanisms for authorization, storage of data, privacy of information, and the

use of appropriate security tools. The Panel appreciates that a robust system, including effective policies and procedures, is consistently implemented, to ensure security of learners' records and accuracy of results.

2.8 During the site visit, the Panel toured the department, college and university facilities at Sakhir Campus. The Panel acknowledges that the Department has adequate classrooms, well-equipped faculty members' offices, laboratories, IT facilities and learning resources to serve its needs at present. However, the very large numbers registered on service courses put pressure on classrooms and introductory level laboratories, which needs to be addressed. Moreover, although the laboratories are not under-equipped, the equipment is outdated in some cases and in need of modernisation. All employees and students of UoB have email and can access Wi-Fi and IT facilities. In addition to the Central Library, a specialized Science and IT library is within a walking distance from the Department of Physics and it has a reasonable collection of printed books, journals and other materials, and access to vast databases of e-books and other electronic teaching/learning and research resources. These are available for students and faculty to access and borrow. Faculty and students can also benefit from inter-library loans from the British library and other libraries in GCC countries. The specialized library also has open computer laboratories with more than 150 seats for students and the Department of Physics provides common areas for students for out-of-class study. The Central Library opens between 7:00 a.m. and 7:00 p.m., while the specialized Science and IT library is open between 7:00 a.m. and 5:00 p.m. The Panel appreciates that overall the College of Science has good facilities to support the students' learning experiences, and that physical and material resources are in general suitable for the programme needs.

2.9 There is a number of tracking systems that are employed for the use of the different resources by the programme, some being manually implemented and others electronically. The 'Blackboard' offers up-to-date tracking of e-learning usage, which shows very limited interaction with this platform by faculty across the University including those involved in the delivery of the BSPH programme. The library tracks the usage of its resources, which also assists it in recalling borrowed materials. During the site visit tours, the Panel noted the timetabling sheets displayed in the department's teaching facilities. In addition, computing usage timetables were displayed in all college computer laboratories. Moreover, the open area computer laboratory technicians keep a daily schedule of the usage of these computers. Nonetheless, tracking of usage of the laboratories are mostly done manually. The Panel notes that there are adequate tracking systems to evaluate the usage of the resources available for the BSPH programme; however, no evidence was provided on how these are used to inform decision-making at a holistic and strategic level relevant to the programme delivery. Hence, the Panel suggests that the College further utilise the information generated by the tracking systems to enhance its decision-making.

2.10 Support, with regard to the library, computer laboratories, and e-resources usage is available to students, and administrative staff adopt the same philosophy of being student-oriented as the faculty do. This was evident during the informal and formal interviews conducted with students. During the site visit, the Panel had the opportunity to visit various entities that provide support services and received the views of stakeholders on the effectiveness of these services. The Deanship of Student Affairs is mandated with providing various kinds of support covering students' life to financial support, where students can be exempted from tuitions fees if they qualify. The Students Services and Development Department provides all students with transportation, special services for students with disabilities, medical treatment, as well as social and psychological guidance through a dedicated social advisor who is based in the College. The Career and Counselling Office provides guidance to students for their future careers, by providing general awareness campaigns as well as individual counselling. Moreover, students and graduates receive mentoring during the process of job application and are helped in writing their resume. Furthermore, an annual Careers Day is organized on a regular basis and students have the opportunity to meet potential employers and seek guidance while at the event. The two libraries are staffed with qualified personnel who provide students and faculty with information and training for effective usage of the resources. Moreover, the laboratories at the Department are maintained by qualified technicians, with a chief technician to oversee smooth running of the facilities. Students interviewed during the site visit who met with the Panel praised the support and services offered by the University and its various departments. The Panel appreciates that the College and University provide a comprehensive level of support and guidance to students that enriches their learning experience.

2.11 The Deanship of Student Affairs, the College of Science and the Department of Physics organize an induction programme for the newly admitted students in the first week of their entrance to the University. During the orientation period, students are provided with documents and attend presentations on university life and facilities, academic regulations, academic advising and guidelines on the use of various resources. In addition, an overview of the different educational and social activities is also provided to students, along with the orientation programme's publications. The induction programme also includes an overview of the College and the Department delivered by the Dean and department's Chairperson, an introduction to the academic programme plan delivered by academic advisors, as well as a touring of college facilities. The library also has an orientation programme for new students and faculty. The Panel appreciates that a comprehensive induction programme is provided for newly admitted students at the university, college and department level. Nonetheless, the Panel notes that the attendance of students in the induction day is low as noted by the department's records. Moreover, students who miss the induction are not provided with an alternative and have to rely on information provided in handbooks

and on the university website. The Panel recommends that the College should provide students who do not attend the induction day with an alternative provision.

2.12 The SER states that each student is assigned an academic advisor and that students are expected to meet their advisor at the beginning of each academic semester. Moreover, the online Academic Advising System facilitates mentoring and advising of students. Advisors can access advisees' information, including academic progress, transcripts, and semester grades and CGPA. The system identifies students at risk of academic failure, which assists in providing early intervention for them. During interview sessions, the Panel was informed that such students will only register in courses after consulting their advisors and getting their approval. The regulations allow students on probation to register for a reduced load and the advisors assist students with course selection to help them move back to normal registration status. Interviewed staff and students informed the Panel about the range of academic and social support provided to at-risk students, in collaboration with the Deanship of Student Affairs' Counselling and Guidance Unit. Moreover, academic warning and dismissal regulations are clear and widely published on the university website. Interviewed students are happy with the support they receive from the academic advisors assigned to them and are satisfied with the degree of advisement they receive. The Panel acknowledges that there are arrangements in place to identify students at risk of academic failure. Nonetheless, statistics provided during the site visit show that at the end of the first semester of the academic year 2015-2016, only three out of 17 students moved back to normal registration. Moreover, in light of the low retention and progression rate, the Panel urges the College to evaluate the effectiveness of the support provided to these students (see the recommendation in paragraph 2.2).

2.13 The SER identifies various opportunities available for informal learning including out-of-class interaction events with faculty, attendance of seminars, workshops and conferences in Bahrain and abroad, and other extra-curricular activities. During the site visit, the Panel learnt that there is an extensive range of informal activities provided for the students to expand their knowledge and experience outside the classrooms and laboratories. These include student societies and clubs, cultural and social activities, as well as sport events. The Panel also learnt that there is a University English Clinic Centre that helps students to improve their skills and performance in reading, writing and scientific report writing, as well as an informal peer-tutoring programme. The SER presents several cases of attending activities abroad, including one student, who had an opportunity to spend more than two months at a facility in Switzerland. Interviewed students talked about how they arrange different activities through the societies and clubs they are members of and expressed their satisfaction with the variety of extracurricular opportunities available for them to expand their learning. The Panel acknowledges the conducive environment and the multitude of opportunities available for students to support informal learning. Notwithstanding

the above, the Panel suggests that the College investigate the reasons behind the senior surveys' outcomes that indicate a relatively low participation in, and satsfation with the extra-curricular activities.

2.14 In coming to its *conclusion* regarding the Efficiency of the Programme, the Panel notes, *with appreciation*, the following:

- There is a formal structure for the management of the programme with clear lines of responsibilities and faculty members are involved in the academic issues of the programme.
- There is research ethos in the Department of Physics that led to it receiving the Deanship of Scientific Research award as the best research productive department in the University in 2016.
- Recruitment procedures are implemented in a transparent manner in alignment with institutional good practices and faculty members are involved in the process, and there is evidence that the Department of Physics has a high faculty retention rate.
- There is a functioning management information system that supports faculty members and students and enhances programme delivery.
- A robust system, including effective policies and procedures, is consistently implemented, to ensure security of learner records and accuracy of results.
- Overall, the College of Science has good facilities to support the students' learning experiences, and physical and material resources are in general suitable for the programme needs.
- A comprehensive level of support and guidance is provided to students that enriches their learning experience.
- A comprehensive induction programme is provided for newly admitted students at university, college and department levels.

2.15 In terms of improvement, the Panel **recommends** that the College should:

- revise, in collaboration with the University, the admission requirements and include programme specific criteria to assess applicants' capabilities to join the BSPH programme
- conduct a thorough study to identify the reasons behind the low progression and retention rates, and develop a plan to mitigate the issue including a full revision of the admission requirements for English language, science and mathematics competencies and the structure and content of the orientation programme
- develop and implement efficient and balanced strategies to lower teaching loads assigned to faculty members in order to promote research and professional development pertinent to modern teaching approaches
- implement a formal faculty induction policy for the programme and evaluate its effectiveness

- evaluate, in collaboration with the University, the current promotion procedures, and develop and implement a mechanism to support faculty members to be promoted
- provide students who do not attend the induction day with an alternative provision.

2.16 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **Efficiency of the Programme.**

3. Indicator 3: Academic Standards of the Graduates

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

3.1 Graduate attributes are set at the university level by the University Intended Learning Outcomes (UILOs), and at a programme level by the PILOs and PEOs. The UILOs are expressed in six high-level knowledge and skills outcomes that are mapped to the PEOs and PILOs, which in turn are mapped to the CILOs. There is a comprehensive spreadsheet for each course that maps each assessment item within the course to the appropriate CILOs and hence, the PILOs. From interviews conducted with alumni, the Panel observes that the programme's graduates are characterised by an ability to work successfully in physics-related career, or to enter a suitable graduate programme. The Panel appreciates that the graduate attributes are stated in terms of UILOs, PILOs and PEOs and that constructive and reliable assessment tools are used to ensure their achievement.

3.2 There is a university policy on benchmarking that broadly describes the purpose and scope of benchmarking activities at UoB. During interview sessions with senior staff, the Panel was informed that the policy was developed in 2015 to ensure that the university's performance is comparable to national and international standards and as a mean for improvement. The Panel finds this policy to be overall appropriate where the purpose is clearly stated, as well as the scope, procedures statements, support procedures, management and implementation responsibilities. Interviewed faculty indicated that the content of all new courses is informally benchmarked against similar courses offered internationally utilising data available on websites. Nonetheless, no mechanism for benchmarking the outcomes of the programme exists at the present. During interview sessions, the Panel was informed that external accreditation is being sought for the programme. However, it is not clear to the Panel that accreditation in and of itself will provide external benchmarking of standards. Hence, the Panel recommends that the College should explore regional and international universities for benchmarking opportunities and expand its benchmarking activities to cover all aspects of the programme and its delivery in line with UoB's own policy on benchmarking.

3.3 UoB has explicit assessment policies and procedures that are adhered to and consistently applied by the faculty of the BSPH programme. These include the 'Study and Exam Regulations at the University of Bahrain', 'Assessment and Moderation Guidelines', 'Anti-plagiarism Policy' and the 'Regulations for Offering/Developing Academic Programmes and Courses at the UoB' documents. These include guiding principles that stipulate when they should be reviewed next. Students are provided with relevant extracts of the assessment polices in the Student Handbook and on the

website, which faculty have access to as well. Moreover, the assessments and their weightings are stipulated in the course specification, which is made available to the students. During interview sessions with the faculty, the Panel was informed that reviews of assessment tools and their mapping to CILOs are undertaken by the Course Coordinator and approved by the Curriculum Committee. Furthermore, the portfolio containing the results and students' grades in each course is passed to the department's Chairperson for approval within three days of the end of final examination period. Currently, the responsibility for implementing the assessment policy lies formally with the QAAC but the department's Chairperson is in a position to reject the submission of marks if all aspects of the course file are not satisfactory. The Panel appreciates that, in general, policies and procedures are relevant, consistently implemented, and made available to students. Nonetheless, the Panel notes that internal moderation is only conducted for multi section courses while external moderation is yet to be implemented. This is discussed in more details in paragraphs 3.5 and 3.6.

3.4 As stated in the SER, there is a formal mechanism to ensure the alignment of assessment to learning outcomes. The assessment in each course is aligned to the CILOs, which in turn are mapped to the PILOs; whereas, the extent to which the assessments have tested the CILOs is evaluated retrospectively through the use of the 'Course Assessment Matrix' that is utilized in every course to demonstrate how each CILO with the level of its achievement is assessed *via* a range of assessment methods including examinations, quizzes, student presentations, and projects. This matrix is made available after the assignment has been set and marked and the results approved. In specific, the QAAC is the responsible unit to ensure that assessments are aligned with learning outcomes through portfolio reviews. The Panel studied the provided reports and notes that these provide an effective mechanism for ensuring correct alignment between assessment and CILOs/PILOs/UILOs and thus graduate standards. The Panel appreciates the mechanisms in place to ensure that the alignment of assessment with learning outcomes is consistently defined and implemented.

3.5 UoB has developed recently a policy for internal moderation that is yet to be strictly adhered to. Currently, as was confirmed through evidence provided and meetings conducted during the site visit, for multi-section courses all instructors are involved in setting and correcting examination papers to ensure consistency of grades; while, in single section courses, setting and correcting examination papers is the responsibility of the course instructor. Therefore, for single-section courses, assessment tools are not formally scrutinised, though the process might occur informally through an agreement between different members of staff. Post-assessment moderation is conducted by the QAAC, which assigns faculty to scrutinise the course files. However, assigned faculty members might not be always specialised. Hence, the Panel notes the implemented procedures are not completely aligned with the moderation policy and

there is no overarching system for monitoring the implementation of the internal moderation of assessment and evaluating its effectiveness. Moreover, some formative assessment tools, such as assignments and quizzes, are not subject to any formal internal moderation. Therefore, the Panel recommends that the College should implement a more formal internal pre- and post-assessment moderation process for all major assessment tools and evaluate the effectiveness of its internal moderation process.

3.6 The 'Assessment, Grading, and Exam Moderation Guidelines' document published in 2015, sets out a policy of external moderation which suggests that some external evaluation of standards, either by external reviews, accreditation or external examiners, should occur within every three years. The Panel heard, however, that external moderation of assessment has not occurred. During interview sessions with faculty, the Panel was informed that proposals to appoint external reviewers have been made by the Department but no decision has yet been received. The Panel is concerned that this is not in line with UoB's moderation guidelines and urges the College to ensure that the assessment practices followed by the Department within the BSPH programme is suitable for the type and level of the course. Therefore, the Panel recommends that the College should ensure that assessments within the BSPH programme are subject to external moderation in line with the university's own policy.

3.7 During the site visit, the Panel was provided with samples of course files that included students' assessed work. The Panel notes that a large element of the assessed work made available to the Panel consists of mathematically-based problems. The students expressed the view to the Panel that these require analysis and critical thinking rather than memorisation and recall. The Panel was informed that these assessments are unseen indicating that the problems test the students' ability to apply knowledge. At the very least, the assessments require knowledge and to this extent, knowledge is developed and deepened throughout the programme. Moreover, as stated in paragraph 3.8, the sample of Senior Research Projects provided to the Panel represents a high level of achievement. Hence, the Panel acknowledges that the level of achievement as expressed in the provided samples of students' assessed work is appropriate for the type and level of the programme.

3.8 The SER states that the achievement of PILOs is confirmed internally by the university's QAAC, which conducts regular audits of course portfolios. As indicated earlier, students' assessments are aligned with specific CILOs and a Course Assessment Matrix is employed to determine the successful attainment of these CILOs. This is used then to ensure that students achieve the PEOs and PILOs *via* the CILOs. The target success level for PILOs in each course has been set internally as 70%. This provides a mechanism for internal evaluation of graduate attributes. The Panel examined the course files of the programme and confirmed that a range of assessment

tools, including final examinations, tests, assignments, projects, are employed in alignment with the type and level of course learning outcomes, and that the final results and grade distributions are at acceptable levels according to regional and international standards. In addition, the sample of Senior Research Projects, represents a high level of achievement. These projects are carried out in the research laboratories with students identifying a problem and designing an experiment to investigate the issue. Moreover, interviewed external stakeholders indicated that the students attain a high standard that meets the needs of employment within the region and a standard that is, in some respects at least, comparable to standards outside the Kingdom of Bahrain. Hence the Panel appreciates that the level of graduates' achievement, in general, meets the programme aims and intended learning outcomes. Notwithstanding the above, the number of students graduating from the BSPH programme is small and the distribution of grades gives no reliable indication of quality under such circumstances. Moreover, the current system used to assess the achievement of the CILOs and PILOs does not ensure that each graduate would attain every CILO once he/she passes a course. Hence the Panel encourages the College to strengthen its mechanisms to address this issue.

3.9 The Panel notes that, while data on students' progress has been collected, the staff interviews showed this data was not widely distributed and hence has not to date been used for quality improvement. There is no evidence that the rates of progression, retention and year-on-year progression are compared internally or externally. Nonetheless, statistics provided indicate an increase in the number of admitted students over the last couple of years. This is due to some hard work on the part of staff to make physics more visible to applicants and the Panel acknowledges the continued efforts of the faculty members in this direction. The Panel also met several students who had transferred into physics from other courses, notably engineering and biology. Nonetheless, the dropout rates for the programme are high, with interviewed academic staff indicating that this is due to students' entrance ability and motivation. The Panel urges the College to conduct a systematic cohort analysis, depicting the ratio of admitted students to successful graduates, year-on-year progression and first destination of graduates and utilise the outcomes to inform decision-making (see recommendation in paragraph 2.2).

3.10 The BSPH programme has a compulsory work-based learning element (PHYS 399) with well-documented procedures to manage its supervision and assessment. To ensure that students have the required background, they must have completed 75 credit hours before they are allowed to register for the course. According to the SER, there are two supervisors, one from industry and the other from the Department. The assessment methods include evaluation of students by the course faculty mentor (20%) during site visits, an evaluation by the internship supervisor (40%), and a final report by the student (40%). Moreover, internship placement is arranged by the College

Training Committee through the University Training Office. During interview sessions, the Panel discussed the mechanisms used for ensuring that placements are appropriate and is satisfied that there is sufficient scrutiny of the placement to ensure that students benefit from the work-based learning. Students with whom the Panel met, both those who had taken the course and those who would take it in the future, were enthusiastic about the experience. However, there was only one student who completed the course and hence the Panel could not draw solid conclusions about learners' experience. Overall, the Panel appreciates that there are policies and procedures in place that are suitable for the management of the work-based learning component of the programme. During interviews with staff, the Panel was informed that the main obstacle for developing the internship continues to be the difficulty in identifying prospective posts. The Panel encourages the programme team to establish stronger links with the industry and to explore a wider possibility of interdisciplinary experience for its students.

3.11 The BSPH programme includes a course for Senior Research Project (PHYS 499), for which students are required to identify a problem, design an experiment to investigate the issue and then carry out a research project in the laboratories. There is a detailed Senior Research Project Handbook developed by the Department to assist students in successfully completing their projects and help staff in their supervision. The Handbook contains appropriate CILOs, suggestions on the selection of the project, details on the requirements in each phase and of the assessment methods. The Handbook also provides a detailed explication of the proper format of the report. Assessment is conducted by the supervisor on all aspects of the project (60%) and by two other internal examiners, where the examiners assess the report (20%) and the presentation (20%). The Senior Research project is identified by staff as a vital aspect of the delivery of high level research skills and the students appreciate the skills that the project enables them to develop and students can register for the senior project if they have completed 90 credit hours. The monitoring and improvement of the projects follow the usual Quality Assurance (QA) process: the Departmental Audit Committee identifies deficiencies in the provision and the QA committee identifies improvements. Evidence provided indicates that this process is robust. During the site visit, the Panel was provided with samples of students' senior project reports to examine. The Panel was satisfied that these reports are well written and demonstrate a high level of attainment comparable internationally. The Panel appreciates that there are clear policies and procedures to support the management and assessment of the senior project course, which are effectively implemented and communicated to the stakeholders.

3.12 The Department of Physics has a Programme Advisory Committee (PAC) that is relatively new. The 'Programme Advisory Committee Guide' document stipulates the general terms of reference for the Committee. During the site visit, the Panel met with

members of the PAC who represent employers of physicists in the region and alumni. Evidence provided to the Panel indicates that the Committee has met twice since its formation. Moreover, there is evidence of the influence of employers on the programme prior to the formation of the PAC, for example through the introduction of meteorology into the curriculum. However, in its present stage of development, there is no evidence to show a significant impact of the PAC on the provision except, perhaps, in the choice of internships that the Department can offer. Nonetheless, interviewed PAC members spoke enthusiastically of the Department of Physics and their desire to strengthen links. Hence, the Panel acknowledges the existence of the PAC and encourages the College to evaluate its effectiveness as it matures.

3.13 The Department conducts surveys of alumni, employers, and exiting seniors. The SER states that employers have been surveyed over their satisfaction with the PEOs and transferable skills of the programme's graduates. In general, the employers have indicated a high degree of satisfaction with all six transferable skills (written and oral communication, critical thinking, use of information technology, ethical practices, and the analysis of information) and two of the PEOs. The Panel noted that the relatively high rate of dissatisfaction of the employers is with regard to the PEO 'pursue a successful career in a physics related field'. Moreover, the Panel was not provided with evidence on the reasons for this and whether the employers think that the PEO itself is not useful or whether the graduates are not meeting this PEO. Nonetheless, the Panel notes that the employer survey was conducted only once lately and that the response rate was very low. Hence the Panel urges the College to ensure the systematic implementation of surveys and take measures to significantly improve the response rate (see recommendation in paragraph 4.8). During the site visit, the Panel met with employers who commented favourably on the knowledge and skills of the programme's graduates, but the extent to which graduates are self-directed and willing to apply their knowledge to broader areas was reported as being variable. Moreover, the exit survey's outcomes indicate a high level (>80%) of satisfaction with the academic aspects of the programme, but a relatively low rate of participation in, and satisfaction with, extra-curricular activities. This matches to some extent the comments to the Panel from the Students Advisory Committee, who have made proposals to reduce the number of external electives in favour of more physics-based courses. The Panel acknowledges that alumni and employers are in general satisfied with the programme and suggests that alumni should be surveyed after two or three years in employment, to assess whether the skills developed during the degree prepared them adequately for the work being undertaken and supported them to progress in their work.

3.14 In coming to its conclusion regarding the Academic Standards of the Graduates, the Panel notes, *with appreciation*, the following:

- Graduate attributes are stated in terms of university intended learning outcomes, programme intended learning outcomes and programme educational objectives, and constructive and reliable assessment tools are used to ensure their achievement.
- In general, policies and procedures are relevant, consistently implemented, and made available to students.
- There are mechanisms in place to ensure the alignment of assessment with learning outcomes that are consistently defined and implemented.
- The level of graduates' achievement, in general, meets the programme aims and intended learning outcomes.
- There are policies and procedures in place that are suitable for the management of the work-based learning component of the programme.

3.15 In terms of improvement, the Panel **recommends** that the College should:

- explore regional and international universities for benchmarking opportunities and expand the benchmarking activities to cover all aspects of the programme and its delivery in line with UoB's own policy on benchmarking
- implement a more formal internal pre- and post-assessment moderation process for all major assessment tools and evaluate the effectiveness of the internal moderation process
- ensure that assessments within the BSPH programme are subject to external moderation in line with the university's own policy.

3.16 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **Academic Standards of the Graduates.**

4. Indicator 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.

4.1 UoB has a set of policies, procedures, and regulations to guide the operations of the College and the programme. These include policies relating to the overall programme, such as quality assurance, assessment and moderation, and benchmarking. In addition, there are detailed policies relating to faculty and staff, such as promotion and appraisal. The policies, procedures and regulations are disseminated using the UoB website and through the 'Faculty Guide, University of Bahrain' document, which was last updated in September 2016. Interviewed staff members were well-aware of those policies and procedures relevant to their work, and interviewed staff advised that they were rarely consulted in the policy development process but were notified when a new policy was posted. Moreover, policies related to students, such as plagiarism and students' conduct, are introduced to them during the induction day and are available in the Student Handbook. During interviews, the Panel learnt that the implementation and continuous revision of these policies are mainly the responsibility of the QAAC. Implementation is managed through clear identification of responsibilities, with key roles at relevant levels. The Panel appreciates that a comprehensive and well-documented set of policies, procedures and regulations is in place. However, the Panel notes that some policies such as the internal and external moderation are not fully adhered to yet. Moreover, the current staff teaching load exceeds what is stated by the university policies. Hence, the Panel recommends that the College should implement a systematic mechanism to monitor the consistent adherence to adopted policies and ensure that actions are taken to address any non-compliance.

4.2 The Department of Physics has a management system involving many committees and a department council presided over by the department's Chairperson. The programme management is executed through these various committees. The academic operation is managed at the department level through the Department Council which is responsible to the College through the College Council and then to the University Council and ultimately to the Board of Trustees. In addition, there are numerous committees at the department level with clear mandates, and decisions of the committees are reviewed by the Department Council. Major departmental committees include the Department Quality Assurance Committee (DAC), the Strategic Planning Committee, and the Curriculum Committee, as well as several others. Interviews and the provided evidence indicate that, although the Chairperson is ultimately responsible for the effective management of the Department, faculty members, through the Department Council and various committees, are involved in developing

recommendations and action plans with respect to the programme. The Panel appreciates that the entire faculty effectively serve as custodians of the academic standards in the programme, which supports effective leadership.

4.3 UoB has a formal Programme Quality Assurance and Enhancement Policy that includes wide ranging procedures on QA, in addition to other policies noted earlier in this Report. Moreover, the University has an Internal Audit Office, which reports directly to the Board of Trustees, as well as the QAAC that are both responsible for assisting the programme in reaching the university's goals. The SER states that the quality assurance management system starts with the DAC, which is responsible for overseeing the implantation of the quality assurance processes in the Department of Physics. The work of this committee is supported by the college's Quality Assurance and Accreditation Office, which ultimately reports to the QAAC at the university level. During meetings with senior management, the Panel learnt that the QA management system is monitored by systematic reporting upwards through committees, including the DAC, Department Council and the College Accreditation Committee. The Panel appreciates the clear and effective quality assurance system in place, which is implemented, monitored and evaluated across the College and specifically by the Department of Physics.

4.4 The SER states that faculty members and supporting staff have a clear understanding of the quality assurance system and are provided with opportunities to attend various workshops organised by the QAAC. Interviewed staff members demonstrated that they are aware of the quality assurance system and are engaged with it through their involvement in its application to teaching and learning. Moreover, evidence provided indicates that issues relevant to QA are included in departmental meetings to raise awareness and ensure that there is a shared understanding in this regard. The Panel also heard from administrative staff in the library, e-learning Centre, IT Centre, and Student Affairs about their roles in supporting student learning. In addition, senior staff interviewed by the Panel emphasized the ongoing review and evaluations by the university's QAAC in promoting QA and accreditation culture within the College. The Panel appreciates that the University provides capacity-building opportunities for all staff to enhance their understanding of quality assurance concepts.

4.5 UoB has a formal policy for the development and approval of new programmes that is stipulated in the 'Regulations for Offering/Developing New Academic Programmes and Courses at the UoB' document approved in October 2013. As per the document, the introduction of new programmes is achieved *via* well-defined processes involving the Departmental Curriculum Committee, Department Council, College Curriculum Committee, College Council, and ultimately the University Council. The policy emphasizes the need to scope the labour market and collect internal and external stakeholders' feedback to align the new programme with current needs in the market

and address suggestions by all stakeholders. However, no new programmes have been developed in the Department of Physics since the development of this policy. The Panel acknowledges the policy adopted to ensure that newly developed programmes are relevant and fit for purpose.

4.6 UoB's Quality Manual stipulates the guidelines for the preparation of internal self-evaluation reports and improvement plans for each academic programme offered by the University. The cycle for the annual evaluation is illustrated in the SER and comprises assessment of achievement level of the PEOs, PILOs and CILOs. During interview sessions, the Panel learnt that faculty members are required to prepare course reports, which include: an analysis of students' achievement and grades with reference to the CILOs, at the end of each semester. These reports are submitted through departmental committees, discussed at the Department Council, and collated to evaluate achievement at the programme level. Programme self-evaluation, on the other hand is conducted every two years and evidence on programme self-evaluation reports and their revision by the DAC and QAAC was provided to the Panel. Evidence provided illustrates how these have led to programme action plans. The Panel notes that department's faculty members are actively involved in the review, the formulation of an action plan and the implementation of the plan. The Panel appreciates that there are mechanisms for the contentious review and maintenance of the programme that lead to improvement. Notwithstanding the above, evidence provided indicates that while some issues raised in the action plan are addressed, others are not completed in time for a future review and there are at present no consequences for this oversight. The Panel advises the College to revise its monitoring process and ensure that action plans are acted on in a timely manner.

4.7 The periodic reviews of programmes are stipulated in the Programme Quality Assurance and Enhancement policy. The policy requires that academic programmes are reviewed every five years *via* a process that incorporates both internal and external feedback, as well as mechanisms for implementing improvement recommendations; however, so far the programme has not been assessed with this policy. In preparation for the process, the Panel was informed that the College has commenced with the surveys of faculty on support services, IT skills, teaching and learning support and instructional methods and tools. The Panel acknowledges that this is a good preparation for a major review as it highlights critical issues which can be addressed and gives enough time to introduce corrective actions. Nonetheless, the programme team needs to also include external elements into its periodic review and expedite the whole process. Hence, the Panel recommends that the College should conduct a periodic review of the BSPH programme that incorporates both internal and external feedback, in line with UoB's stated policy.

4.8 The Panel notes that survey forms are available for employers, faculty, graduating students and alumni. All these surveys are periodically collected and analysed in order to be aligned with the Programme Quality Assurance and Enhancement Policy. The Panel studied these surveys and noted that there is no evidence that structured comments are sought from students or other stakeholders. The surveys require, in general, either a yes/no response or a graded positive/negative response. The survey reports are presented as a table of assessment of programme educational outcomes by employers and alumni and the programme intended learning outcomes by senior student exit survey, which are then used to develop action plans. The Panel appreciates that the feedback collected from stakeholders' surveys are analysed, and the outcomes are used to inform mechanisms for programme improvement. However, it is not clear if the results of these surveys are shared with stakeholders. Moreover, whilst the survey structure can identify that a problem exists, there is no indication of the nature of the actual problem. Hence, the Panel advises that future surveys incorporate the opportunity for feedback by comments. Furthermore, evidence provided indicates that the employers and alumni satisfaction surveys were conducted once only. Hence, the Panel recommends that the College should further develop its system for the collection of structured comments from external stakeholders, analyse all stakeholders' feedback and use the outcomes to inform decisions on programme improvement in a more holistic form, and provide feedback to stakeholders.

4.9 The Panel notes that there is evidence of formal professional development activities provided by UoB in terms of teaching and QA. Moreover, faculty members are encouraged by the College to participate in local, regional, and international conferences and training programmes. Following interviews with senior management, the Panel learnt about the trend at the university level towards increasing provision of continuing professional development for staff, including compulsory development for specific groups. Therefore, newly appointed academic staff can participate in the Postgraduate Certificate in Academic Practice (PCAP) programme, which is aligned to the UK Higher Education Academy Fellowship. Nonetheless, from evidence provided and interview sessions, the Panel confirmed that the participation of faculty members in these activities is limited to only six out of the 16 faculty members responsible for the delivery of the BSPH programme. The SER indicates that increased teaching load may be contributing to a lack of available time for faculty; however, in interviews, staff informed the Panel that the most important issue is that the professional development courses on offer are decided at a senior management level, are mainly related to the QA process and do not match their specific and professional needs as scientists. The Panel recommends that the College should develop a mechanism that allows staff to identify their professional development needs. Moreover, as there is no annual faculty members' appraisal process in place, there is no clear system for identifying the staff needs, both individually and collectively.

Hence the Panel recommends that the College should develop and implement a comprehensive staff appraisal system and utilise its outcomes to inform professional development needs.

4.10 The Department of Physics indicates that it utilises the feedback from PAC and information gathered during the 'Career Day', organised annually by the University to gage the market and scope the future labour market needs. However, no evidence was provided that formal comprehensive scoping of the labour market was undertaken by the programme team. Moreover, during discussions with industry representatives the Panel heard that they did not participate in the careers days as either they did not know about them or they felt that the success rate in finding physics students is slim. Interviewed students also indicated that the way the 'Career Day' is conducted currently is too diverse, making it difficult for them to target their specific interests. Therefore, the Panel concludes that the current practice does not provide the College with a holistic approach towards identifying the market needs, whether in the short-term, or more importantly, on the long-term. Hence, the Panel recommends that the College should scope the labour market in a comprehensive and formal manner to ensure that the BSPH programme is current and meets the needs of the market.

4.11 In coming to its conclusion regarding the Effectiveness of Quality Management and Assurance, the Panel notes, with *appreciation*, the following:

- There is a comprehensive and well-documented set of policies, procedures and regulations that is in place and is suitable for the programme needs.
- There is provision for the entire faculty to effectively serve as custodians of the academic standards in the programme, which supports effective leadership.
- There is a clear and effective quality assurance system in place, which is implemented, monitored and evaluated across the College and specifically by the Department of Physics.
- The University provides capacity-building opportunities for all staff to enhance their understanding of quality assurance concepts.
- Mechanisms are in place for the contentious review and maintenance of the programme that lead to improvement.
- Comments collected from stakeholders' surveys are analysed, and the outcomes are used to inform mechanisms for programme improvement.

4.12 In terms of improvement, the Panel **recommends** that the College should:

- implement a systematic mechanism to monitor the consistent adherence to adopted policies and ensure that actions are taken to address any non-compliance
- conduct a periodic review of the BSPH programme that incorporates both internal and external feedback, in line with UoB's stated policy

- further develop the institution's system for the collection of structured comments from external stakeholders, analyse all stakeholders' feedback and use the outcomes to inform decisions on programme improvement in a more holistic form, and provide feedback to stakeholders
- develop and implement a comprehensive staff appraisal system and utilise its outcomes to inform professional development needs with a mechanism that enables individual staff members to identify their needs
- scope the labour market in a comprehensive and formal manner to ensure that the BSPH programme is current and meets the needs of the market.

4.13 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **Effectiveness of Quality Management and Assurance.**

5. Conclusion

Taking into account the institution's own self-evaluation report, the evidence gathered from the interviews and documentation made available during the site visit, the Panel draws the following conclusion in accordance with the DHR/BQA *Programmes-within-College Reviews Handbook, 2014*:

There is confidence in the B.Sc. in Physics of College of Science offered by the University of Bahrain.