PERIODIC REVIEW OF BIOLOGICAL SCIENCES

Introduction

1 An internal review of programmes in the School of Biological Sciences was held on 14 and 15 December 2017. The members of the Panel were:

- Professor Clare Furneaux, Teaching and Learning Dean *(Chair)*
- Geoffrey Lester, Royal Berkshire Hospital (retired) *(external member, industry)*
- Professor Paul Ashton, Edge Hill University *(external member, subject specialist)*
- Dr Fiona Stainsby, Edinburgh Napier University *(external member, subject specialist)*
- Dr Laura Bennett, School of Law *(internal member)*
- Julie Cooper, Business Informatics Systems and Accounting *(internal member)*
- Thomas Wise, School of Psychology and Clinical Language Sciences *(student member)*
- Richard Sandford, Centre for Quality Support and Development *(secretary)*

2 The Panel met the following:

- Professor Rob Jackson *(Head of School)*
- Dr Philip Dash *(School Director of Teaching and Learning)*
- Dr Andrew Bicknell *(Senior Tutor and Examinations Officer)*
- Dr Phil Baker *(Programme Director: BSc Zoology)*
- Dr John Bowen *(Programme Director: BEng/MEng Biomedical Engineering)*
- Dr Graham Holloway *(Programme Director: MSc Species Identification & Survey Skills, and MSc Wildlife Management & Conservation)*
- Dr Lizzy Lander *(Programme Director: BSc Biochemistry)*
- Dr David Leake *(Programme Director: BSc Biomedical Sciences)*
- Dr Sheila MacIntyre *(Programme Director: BSc Microbiology)*
- Dr Kat Bicknell *(Programme Director: Science Foundation Programme – School of Chemistry, Food and Pharmacy)*
- Dr Lindsey Thompson *(Director of Special Projects, and Senior Teaching Fellow)*
- Dr Dyan Sellayah *(Lecturer)*
- Dr Craig Hughes *(Lecturer)*
- Dr Alice Pollitt *(Lecturer)*
- Dr Evangelos Delivopoulos *(Lecturer)*
- Dr Yoshikatsu Hayashi *(Lecturer)*
- Dr Faustina Hwang *(Associate Professor)*
- Professor Rachel McCrindle *(Director of Student Experience)*
- Professor Simon Sheratt *(Director of Diversity, Inclusion & Wellbeing, and Director of Staff Teaching and Development)*

3 The Panel met nine students (six undergraduates and three postgraduates) who represented the following degree programmes:

Periodic Review of Biological Sciences – Prof Clare Furneaux & Richard Sandford:

- BSc Biological Sciences
- BSc Biomedical Sciences
- BSc Ecology and Wildlife Conservation
- BSc Microbiology
- MSc by Research Biomedicine
- MSc Molecular Medicine
- MSc Species Identification and Survey Skills

4   The Panel met two recent graduates who had graduated from the following degree programmes between 2014 and 2017:

- BSc Biomedical Sciences
- BSc Ecology and Wildlife Conservation
- MSc by Research Biomedicine

General observations

5   The Panel met with a range of staff from across the School, largely with teaching and learning responsibilities. The staff were fully engaged with the process and made the Panel welcome. The review benefitted from a comprehensive and well-organised Blackboard organisation, and any additional information request by the Panel was supplied in a timely fashion. However, the Panel noted that the student work submitted for their consideration was not accompanied by feedback, rubrics or assessment briefs. These items were supplied after the Review and a representative of the Panel considered them post-visit. The Panel found the resources provided invaluable in their review of the School's activities. The Panel extends its thanks to the School for its hospitality and engagement with the process.

6   The Panel welcomed the opportunity to meet face-to-face with some current and former students, who gave positive endorsements of their programmes and experiences at Reading. However, as the Review took place out of term-time there was limited access to students. The Panel wishes to express its thanks to these students and alumni, and to those students who contributed to the written Student Submission, for their valuable input to the Review.

7   The students met expressed their enthusiasm for their programmes and spoke positively about the support they received from staff. The Panel found that staff they met from within the School are committed to the enhancement of the student experience.

8   The Panel noted that the School had contended with several considerable changes in recent years, and had been proactive in meeting the associated challenges. Changes to the structures within the University have meant that the School does not enjoy the same targeted administrative and technical support as it had previously. Successful recruitment has seen increases in class sizes with a commensurate impact on student experience. Finally, the closure of the School of Systems Engineering has seen staff and students migrate from that School into the School of Biological Sciences and the successful introduction of a new programme (BEng/MEng Biomedical Engineering).

Academic standards of the programmes

Committee structures

9   Overall, the Panel was satisfied that the committee structures in place were appropriate and effective for the quality management and enhancement of the School's programmes.

10   The Panel was pleased to note that, in addition to the standard University-prescribed committees, the School benefits from a Teaching Enhancement Group and a Teaching and Learning Leadership Group, both of which were still relatively new, having been set up in the year preceding the Review.

The Panel felt that these innovative groups could help foster a sense of inclusion and ownership of matters pertaining to Teaching and Learning across the School **[good practice a]**.

11 The Panel was also pleased to see that the membership for the Teaching Enhancement Group was open to all in order to encourage those without official administrative roles to engage in the development of Teaching and Learning. However, the Panel felt that the membership and terms of reference for the two new groups should be reviewed and updated in order to encourage accountability and to make clear the links between committees/groups with T&L oversight within the School. This would help ensure broader membership of the groups and improve their impact **[advisable recommendation a]**.

12 The Panel found evidence in the Minutes of meetings that the various School and programme level committees were fulfilling their formal responsibilities in respect of quality management and enhancement. This included giving proper consideration to External Examiner Reports, National Student Survey (NSS) and Postgraduate Taught Experience Survey (PTES) results, annual programme reporting and proposals for new programmes/amendments to existing programmes.

Programme design

13 The Panel received and considered programme specifications, module descriptions, programme handbooks, External Examiners' reports and samples of student work and feedback. Additionally, the Panel spoke with staff and students about their experiences of programmes. On the basis of this evidence the Panel was able to confirm that the academic standards of the programmes under review were appropriate and comparable to programmes on offer at other universities.

14 The Panel was satisfied that the programmes are designed in accordance with external reference points such as the HEA and relevant QAA Benchmark Statements. The Panel considered that the programmes offered were coherent and of appropriate scope. The BSc Biomedical Sciences has been designed in accordance with criteria set out by the Institute of Biomedical Sciences, as it is accredited by that body[1].

15 The Panel was pleased to note that many of the programmes offer students opportunities to experience their subject outside of the institution (eg through field trips, working with professional bodies, and the growing provision of placement opportunities). The Panel felt that the integration of research skills into teaching helps ensure that students are prepared for the dissertation and not overwhelmed by that experience. The Panel felt that there was some evidence that the programmes were designed in such a way as to help students develop key sets of skills and knowledge as their course progresses and as they mature.

16 Students and employer statements spoke favourably about the lab experience that the students are exposed to. The new and existing lab provision enables good student practical experience across the programmes. The Panel felt that this was a main distinguishing feature of the programmes.

17 The Panel recognised that the students' exposure to laboratory and field courses offered the School a significant competitive advantage. Such exposure means that the students are able to acquire key practical scientific skills ahead of embarking on their final year research project.

18 However, the current complexity of the modular structure and overabundance of optional undergraduate module choices means that it is difficult to monitor the development of practical skills over terms and levels of study effectively. Additionally, it is unclear whether there is

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[1] Subject Benchmark Statement - Biomedical Sciences: www.qaa.ac.uk/en/Publications/Documents/SBS-Biomedical-sciences-15.pdf

Subject Benchmark Statement - BioSciences: www.qaa.ac.uk/en/Publications/Documents/SBS-Biosciences-15.pdf

Institute of Biomedical Sciences Accreditation information: www.ibms.org/education/university-information/

equivalency of student experience and practical skills development both within and between programmes.

19   The Panel also thought that employability might be better integrated into the curriculum. The Panel noted that work in this area was underway with the development of 'Key skills in...' modules, the introduction of the placement year and summer placement option modules, and the appointment of a Director of Placements and Employability. These actions signal the School's commitment to increasing placement uptake and the concomitant development of employability skills. However, the Panel considers that the employability skills developed during placement need to be clearly articulated and integrated within a wider exercise in employability skills mapping and development across programmes.

20   The Panel also found that the development of programme-specific knowledge, and practical and scientific skills, and their equivalency across different module combinations are, in places, unclear. Similarly, how modules enable effective transition into university study and subsequently across levels of study is not clearly mapped, and there are also some overlap in topics across modules (which is a legacy from the change in the credit-weighting of modules).

21   The Panel noted various concerns regarding module assessment and feedback (see 29-38 below). The Panel felt that the development of a programme-level assessment map across the biological science provision, as good practice under the Curriculum Framework requires, would enhance programme design considerably, and have positive impacts on student engagement and experience and on staff time.

22   The Panel noted that the School Director for Teaching and Learning had undertaken some preparatory work for delivery against the University's Curriculum Framework. However, the overall School engagement with this project was felt to be in the early stages. The timing of the Periodic Review meant that little evidence of wider engagement was available. Plans appear to be in place for future developments that will consider a review of teaching and assessment in relation to the main themes of the Curriculum Framework, and changes at the module and programme level will allow the student journey to be clearly mapped, and if necessary amended accordingly. In part, these changes are a consequence of implementing changes from the HEA-assisted review in 2014. The impact of these changes now needs to be considered in light of the aims of the Curriculum Framework.

23   In the light of comments in Paragraphs 18-22 above, the Panel felt that the School should undertake an exercise to map practical skills and also reshape the programmes in accordance with the Curriculum Framework. This would help ensure linkage and development of key skills over levels of study as well as parity of experience for students taking different module combinations. Practical skills development should offer students opportunities to grow in skills and confidence, and to evaluate their own aptitude/competencies. Practical skills development within a given programme should be clearly articulated to students to help inform module choices, allow self-reflection on development and identify key employability skills **[advisable recommendation b]**.

24   The Panel heard that the final year Research Project is oversubscribed, although increasing numbers of placements has helped to alleviate this somewhat. The graduates from the undergraduate Biological Science programmes reported varying experiences on their final year projects. As the final project is the cornerstone of the undergraduate programme, enhancing the student experience on this module should be a key aim during any programme review. There should be a focus on project diversity, alignment to programme title, and the development of practical and employability skills.

Assessment and feedback

25 External Examiners' Reports verified that the standards achieved by learners met the minimum expectations for the awards, as measured against the relevant Subject Benchmarking statements and the Framework for Higher Education Qualifications. It was clear to the Panel that comments made by the External Examiners were considered by the School, and that colleagues are reminded to take them into account when setting assessments.

26 The School has only one professionally-accredited programme: the BSc (Hons) Biomedical Sciences, which is accredited by the Institute of Biomedical Science (IBMS). It is currently in the process of being reaccredited, and the Panel understands that the next step is for the IBMS to visit the School to discuss the proposal to introduce placements into the programme. The School has not been informed by the IBMS of any other concerns relating to its reaccreditation submission. It was very pleasing to note that the External Examiner for this programme is impressed with the level of student attainment, which he has described as ahead of the achievements of most universities in this area.

27 The Panel found evidence that the undergraduate and taught postgraduate programmes included a variety of assessment methods, and that students were generally satisfied with the range used and their level of difficulty. The Panel was particularly impressed with two assessments, one at undergraduate level, and one at postgraduate level, which encouraged students to engage with the requirements of academic journals **[good practice b]**.

28 The Panel encourages the School to consider carefully its use of formative and summative assessments, both within and across modules/levels. This would help them to avoid multiple assessment of individual learning outcomes, utilise assessment tools that best assess given learning outcomes, and to take an 'assessment for learning' approach where formative and summative assessments are fully integrated with the learning experience. The Panel also felt that a higher weighting could be given to summative assessments undertaken during the year and that the School could extend their current practice of exploring alternative types of assessment. These measures would enable a move away from the current emphasis on examination-based assessments and better support the diversity of learning styles amongst the student body.

29 The Panel noted that the number of assessments was rather high on some modules, particularly 10 credit modules. Students have expressed concern in relation to a) the number of assessments; b) the bunching of deadlines and c) the relatively low weighting of coursework as compared to the examination (usually 30%:70%).

30 Colleagues within the School are concerned that the sheer volume of assessments coupled with the 15 working day marking deadline stifles innovation in terms of assessment methods. The School has also established that the ratio of summative to formative assessment is disproportionately high. The Panel was pleased to note that the School is already well aware of the need for a substantial rethink of its assessment regime at undergraduate level and commends the SDTL for instigating a mapping of the current position.

31 The external Panellists felt that the 15-working-day deadline for feedback might be particularly onerous and noted that the practice at some other institutions had greater flexibility. The Panel noted the School's general compliance with the 15-day requirement and recognised the associated pressures of delivering detailed and useful feedback to large cohorts in a limited timeframe.

32 The Panel recommends that the School should continue its review of assessments and revise them as part of its Curriculum Framework programme review to ensure that:

    a. they are of the appropriate level;

b. they allow students to demonstrate they have met the programme and modular learning outcomes, including employability skills;

c. the assessment burden on staff and students is reduced and the timing of assessment is improved; and,

d. assessments are carefully scaffolded so that summative assessment in one Part of the Programme can act as formative assessment for the following Part.
[advisable recommendation c]

33 As part of this review, the Panel recommends that the assessment load per module is considered, and in particular, that 10 credit modules should not have more than one assessment other than in exceptional circumstances **[advisable recommendation d]**.

34 Further, the Panel recommends that the School should have more confidence in coursework as a mode of assessment and increase the weighting of assessed coursework (where it is used) relative to examinations to at least 50% of the overall module mark **[advisable recommendation e]**.

35 The Panel noted that student opinion on the clarity of assessment criteria and on the quality and timeliness of feedback on assessments was divided. A key area of concern is that feedforward is not sufficiently detailed or precise to enable students to understand what is needed to obtain a first class or 2:1 mark, what they did well, and what they need to do better next time. Some very good students suggested in the Learning Gain survey that they did not receive feedback of any real value (although the sample of students was very small).

36 Students say that there is a lack of consistency in the quality of feedback across tutors and modules. The feedback examined by the Panel bears this out, with a variety of approaches being taken. Some use standard rubric step-marking for all grades with generic comments to guide students, accompanied by annotation on the face of the assessments. Others give quite detailed feedback in the comments section on Turnitin, but a lack of annotation on the assessments themselves may make it difficult for students to identify the places in their work to which the comments relate.

37 The use of group or generic feedback on assignments and exams has also been trialled in the School with mixed success. Whilst the School reports a positive reaction to generic feedback in exams and its use as guidance for future cohorts, the student submission suggests that satisfaction with this process is not as high as it might be, and highlights this as an area for improvement.

38 The Panel therefore recommends that the School work with students as partners in developing a coherent feedback policy and guidelines for colleagues to ensure greater consistency across tutors and modules. This would include ensuring that communication is effective to students around:

a. Module selection;

b. Assessment and feedback;

c. Reasons for specific forms of assessment; and,

d. Skills used
[advisable recommendation f].

Quality of learning opportunities offered by the programmes

Teaching and learning

39   The Panel found the quality of teaching and learning in the School to be very good, with staff delivering high quality, innovative and varied modules. This quality is positively commented on by students and external examiners and at both undergraduate and postgraduate level.

40   The Panel found that staff in the School have the required range of specialist expertise to support the high-quality delivery of both undergraduate and postgraduate programmes.

41   The recent merger with part of the former School of Systems Engineering (SSE) has introduced several new academics to the School. The introduction of new expertise has afforded the opportunity to launch a new undergraduate programme in BEng/MEng in Biomedical Engineering. The merger appears to have been highly successful with staff and students from the former SSE reporting that they have integrated well with SBS. It is evident that this merger will not only bring opportunities for new programmes but also for sharing good practice, particularly with respect to creating a sense of programme identity and developing student communities.

42   Staff draw significantly on their research, and teaching is research-led. A large proportion of staff are research-active and they deliver modules and projects in their areas of expertise. This is reflected both in modules and projects specifically aligning to staff research interests, as well as the general embedding of a research-informed approach to module delivery.

43   As a result of this research ethos the quality of the material delivered and the way in which it is taught often brings the results of the latest research to the classroom. Lecturer enthusiasm for their subject is contagious and students often find themselves enthused with a similar passion for the subject (as evidenced through student testimony and high student retention) **[good practice c]**.

44   Students also participate in research during their programme. This includes the discussion of research articles throughout their degree, attendance at seminars delivered by external speakers, and the undergraduate Part 3 project. This participation in research culminates with research-based MSc programmes.

45   The Panel found that modules are varied in nature. As well as research-based modules, students engage in a range of practical-based modules offering laboratory and field experience and embedding use of the excellent Cole Museum of Zoology. This practical aspect to teaching and learning is also embedded at the postgraduate level. This is a particular strength of the teaching and learning of the School, as confirmed by External Examiners and recent graduates, and the School is to be commended on this use in teaching and learning of extensive practical work **[good practice d]**.

46   The Panel also notes the key supporting role provided by technical and administrative staff in the delivery of these key elements of the School's programmes.

47   The Panel was pleased to note the variety of delivery methods for modules within the School, including not only traditional lectures and small-group teaching, but flipped classroom, peer learning and residential field courses. Modules also make use of the Cole Museum of Zoology, as noted above. The School also makes use of technology enhanced teaching and learning with the use of Facebook, Instagram, wikis and blogs, and the regular use of lecture capture (in the form of audio recordings which are then made available via Blackboard).

48   The Panel found that there are opportunities for students to tailor their degree through optional module choice and the Student Submission indicates that students appreciate this flexibility. Students are satisfied with the range of module choices available to them. As mentioned above (Paragraph 18), the Panel noted that this flexibility can cause difficulties – and this is also in relation

to having studied the required pre-requisites for later levels of study. The School has responded to this by developing a system that advises Part 2 undergraduate students on the most appropriate optional choices and 'pre-selects' them for them. Students appreciate the identification of advisable optional choices. The School is commended for the introduction of the "prescribed routes"/recommended modules which support student learning thought their degree, as well as alleviate pressures around timetabling and module selection **[good practice e]**, though it notes that a considerable proportion of students changed from modules selected. The continued trialling of this pre-selection system next year was welcomed by the Panel.

49   The Panel felt that the support offered to meet the needs of the diverse nature of the cohort further enhances Teaching and Learning within the School. This is evidenced, for example, by the use of the Science Foundation as an entry route to programmes and the introduction of 'Key Skills in…' modules at Parts 1 and 2 (many aspects of which then integrate into student learning on other/later modules). The School is to be commended on its willingness to be innovative in finding responses to the challenges of a diverse student cohort **[good practice f]**.

50   The Panel was impressed by the range of approaches that the School adopts to facilitate student engagement and to reach into the student community, including the development of Facebook Groups and Instagram accounts, which are utilised in such a way as to ensure that messages are effectively broadcast to students and comments are responded to **[good practice g]**.

51   Staff are well supported in developing approaches to teaching and learning and their continued professional development. The quality of teaching and learning is maintained and enhanced not only by the additions to the 'standard' committee structure that the School has established (see 10 above) but also in the School taking an inclusive approach to individual Teaching Intensive colleagues' interests in terms of pedagogic and/or discipline-specific research through workload allocation, so allowing continuous personal/professional development. This encouragement to (and facilitation of) staff to undertake pedagogic research alongside, or instead of, discipline specific research shows a commitment to the development of T&L practices within the School **[good practice h]**.

52   Students feel very positive about the quality of teaching they receive and the learning that occurs. Students view lectures as interesting and engaging and staff as approachable, informed, experienced and eager to talk about their subject. Postgraduate students were particularly positive about the research and critical thinking features of their programmes. Staff are supportive of students both within sessions and outside the classroom. This is appreciated by the students, who also state that support for their learning is good and takes their individual needs into account. Academic staff are praised by students and external examiners for responding to student needs (see also 100 below). The School is to be commended on the range of its responsiveness to student needs **[good practice i]**.

Student admission, retention, progression and attainment

53   The Panel noted that the School had recently launched "…with Foundation" versions of most of its undergraduate programmes. These programmes had been given a 'soft' launch in 2017/8, with students who had not achieved the required grades for the undergraduate programmes being offered the opportunity to enter Reading via this route. The School had experienced unexpected demand for this offering and welcomed 38 students via this route. The Panel felt that the School had responded well to the challenges of running new programmes for unpredicted numbers of students, and were supporting the Foundation Programme Director, who is based in the School of Chemistry, Food and Pharmacy, in the delivery of the programme **[good practice j]**.

54   However, the Panel noted that in addition to its promising recruitment, there are other complicating factors around running the Science Foundation Programme, including the fact that it cuts across two Schools, and its interplay with the International Foundation Programme. The Panel noted that the programme currently lacks central administrative support, and that this might have

a detrimental impact on the student experience and the Schools' ability to successfully run the programme. The Panel recommends that the University reviews the administrative support of the Science Foundation Programme and appoints dedicated administrative support **[necessary recommendation m]**.

55   The Panel was impressed with the School's continuing strong recruitment in a highly competitive market (with 340 students recruited to Part 1 in 2017/8, up from below 200 per year). The Panel heard about the School's approach to Open and Visit Days and its use of those events as the start of a dialogue with prospective students. Open/Visit Days are followed up with tailored communications. The Panel felt that the range and standard of some of the facilities on show during the events also had a strong role to play in helping prospective students choose Biology at Reading. The Panel noted that the School benefits from the enthusiastic participation in the events by staff and students, who are keen to promote the School to prospective students and provide a welcoming environment **[good practice k]**.

56   The School has introduced a number of novel approaches in order to support the larger cohorts. As noted below (69), students are allocated to tutor groups via criteria which are designed to help the School identify and provide any additional support. The School has also increased the number of drop-in sessions for Part 1 modules where students can seek advice on any aspect of their programme. Finally, the introduction of the "Key Skills in..." modules sees students working in small groups on key foundational academic skills on dedicated modules. The Panel would suggest such key skills work also becomes embedded in all modules as part of the Curriculum Framework review of programmes.

57   The Panel heard that staff provide guidance and support to students in choosing their modules and pathways through programmes. This is particularly helpful given the large range of modules and specialisms on offer. The School has augmented this process by introducing "prescribed routes"/recommended modules onto which students are automatically enrolled (see 48 above). These "prescribed routes" have been formulated based on the trends of the most common choices.

58   The Panel noted the School's low attrition rates, with no more than 2% of students failing at second attempt on any Part of the undergraduate programmes. This is especially noteworthy when considering the fact that the BSc Biomedical Sciences programme has more stringent progression rules than other programmes in order to meet its IBMS accreditation requirements.

59   The Panel noted that the performance of undergraduates has been consistent between 2013-14 and 2015-16, with approximately 70% students achieving 1st or 2:1s in this period. This is below the University average of around 80%.

60   The Panel noted the range of postgraduate programmes on offer within the School, including the recent addition of two new programmes (MSc Applied Entomology and, MSc by Research Entomology), which have recruited just one person between them since launch in September 2017. The size of the cohorts on these programmes was often quite small, labour intensive and often with wide module choice to ensure broad student appeal. The Panel would counsel the School to consider the sustainability of such activities. The Panel recommends that the School continues to monitor the efficiency of current and prospective taught postgraduate provision (ie student numbers on programmes, modules, and student destinations) to ensure that they are sustainable **[desirable recommendation k]**.

61   In contrast, recruitment to the MSc in Species Identification has been buoyant, with numbers increasing from 16 in 2015-16 to 27 in 2016-17. The MSc in Wildlife Management and Conservation has recruited steadily with around 15 students each year from 2012-13 to 2016-17.

62   The Panel was pleased to note that postgraduate outcomes are considerably stronger than the University average, with merits and distinctions constituting 89% in 2013-14, 88% in 2014-15 and 95% in 2015-16, against University averages of around 78% for the same period.

63   The Panel felt that the School could benefit from additional support in marketing its programmes to international students. This would particularly support activities at the taught postgraduate level, but would also help further develop the diversity of cohorts across the School. The Panel recommends that the University provides marketing intelligence and support to the School to help enhance recruitment activities, especially with regards to international recruitment **[advisable recommendation n]**.

Learning environment and student support

64   The Panel did not meet the technical team but heard about the vital role that they play in scheduling and organising laboratory practical classes. The School experienced problems with providing technical and administrative support in the period after the Professional and Administrative Services review restructuring. The School is working with colleagues in central services to address these problems and is continuing to develop processes which facilitate the scheduling and delivery of these laboratory sessions. The Panel felt that there may be opportunities to further involve the technical team in discussions around practical based teaching development and delivery, and the student experience (e.g. inclusion in SSLC meetings, and in Curriculum Framework review activities such as skills mapping). The continuing input of the technical team will be vitally important in the transition to the new Health and Life Sciences Building in 2020 and their involvement in the programme review at this stage will help this process considerably.

65   The Panel was impressed by the developing plans for undergraduate SSLC meetings. These include increased frequency of meetings, more focussed discussions (e.g. thematic agendas for meetings), and the involvement of both Programme and School student representatives. The School should continue to build on the improved communication between staff and students to ensure that it is frequent, clear and effective and that the feedback loop post-SSLC meeting is closed.

66   The Panel noted that student experience of the Personal Tutor system was variable. Some students reported a high degree of interaction with their tutors, whilst others reported that they had little or no interaction. Those who reported good interaction indicated that tutors were supportive and provided encouragement and guidance on their studies.

67   Students (and some staff) seemed unclear as to the purpose of the Personal Tutor role, beyond providing 'general support' and therefore were unsure of what they should expect from these interactions (or of the level of interactions they should expect). There was a perception amongst the student body that not all Personal Tutors were actively engaged with the role and therefore that they might not take a structured approach to providing support and guidance. Postgraduate students indicated that it would be particularly helpful to have some guidance on the role during their induction, especially with regards to those challenges most commonly faced by overseas students.

68   New staff reported that there is no formal training programme for the Personal Tutor role and they generally refer to more experienced staff when dealing with more complex student issues. Staff may ask for specific training through the Professional Development Review process but there are a limited number of training events provided centrally within the University. The current Personal Tutor allocation system means that the workload burden from complex student issues is held mainly by more senior staff. It was acknowledged that attention should be given to ensure that those newer to the Personal Tutor role also acquire experience with more complex issues.

69   The Panel heard that the School has recently introduced a new system for the allocation of students to Personal Tutors for the 2017/18 academic session. The Panel heard that the new system had been instigated largely in response to the higher intake of student numbers and the consequent shift in entry grades and other changes to the student cohort profile (including more students with additional needs and those from different educational backgrounds). The new

system attempts to match staff experience with the profile of students. The Panel heard that the same criteria for allocating students to Personal Tutors are also used for assigning them to "Key Skills in…" module groups. The Panel felt that this may risk inequity of student experience and may have further workload implications for more experienced Personal Tutors. The Panel recommends that the School undertake a review of the criteria used for matching new students to Personal Tutors (and assigning them to "Key Skills in…" module groups), and to question the assumptions at play in the development of those criteria. The School should develop a new model for the allocation of Personal Tutors (and "Key Skills in…" modules) in order to ensure that students are able to mix with students from a variety of backgrounds and enjoy the benefits such exposure affords **[advisable recommendation g]**.

70   The Panel notes that there is a University review of the Personal Tutorial system currently underway. However, the Panel encourages the School to undertake its own review of its Personal Tutor role and system to ensure that it is effective in delivering student support, linking with central support services, and in developing staff in that role. Such a review should consider:

   a.   Developing a system of allocation of tutees (see above) which does not overburden the more experienced personal tutors - and which gives less experienced tutors the opportunity to grow in the role;

   b.   ways in which staff and student understanding of the role (and associated expectations) could be improved;

   c.   how to provide staff with a more uniform experience of the system through guidance and support;

   d.   whether a peer support or 'buddying' system could be put in place to support colleagues new to the role;

   e.   ways to improve the engagement with the system by all colleagues;

   f.   enhancing the role to include the provision of guidance to students on identifying their transferable skills (hence improving employability), to support module choices, and to provide further support students in their transition to HE.
   [desirable recommendation l]

71   The Panel noted that the School's administrative support had changed with the University's PAS (Professional and Administrative Services) review, with teaching and learning administration and student support now provided centrally by the relevant Support Centre. Staff have found that the change in administrative support has increased their burden of work and the Panel recognises the efforts that have been made to ensure that the student experience was not adversely affected during this period of change.

72   Students reported that the Student Support Centre is easily accessible, that interaction is straightforward and that they received regular communications regarding the services available.

73   The Panel was impressed with the range of teaching facilities available to the School. These include biomedical sciences, microbiology and zoology laboratories; the Herbarium; greenhouses; and the Cole Museum of Zoology. The students reported positively on the facilities, and they reported that the School makes excellent use of them for teaching and learning. The School recognises the overall appeal of the facilities and highlights them during Open and Visit days. Although generally well equipped for teaching purposes, the laboratory spaces vary in modernity and accessibility. In particular, the microbiology laboratory is not equipped to enable students with poor mobility to work there and, indeed, the building in which the lab is housed also lacks suitable wheelchair access.

74   The Panel noted the School's SED ongoing concerns with the level of IT equipment in current teaching rooms. Whilst a new building is planned (see paragraph 75) which may alleviate many of these issues, there are issues reported that need attention now in cross-campus teaching spaces, where possible, and bearing in mind in the new build. It is important that IT issues do not prevent

log-in at computers in teaching rooms, that projectors should be bright enough and that screens are large enough for all students in the class to see all of the material adequately. The Panel recommends that relevant parts of the University consult with the School to identify and address immediate issues, and ensure that plans for the new building resolve them in future teaching spaces **[advisable recommendation o]**.

75   The School of Biological Sciences will relocate to a new purpose-built Health & Life Sciences Building, which will also provide a new home for the Cole Museum (scheduled for opening in ~2020). This will provide newly furbished flexible laboratories designed to accommodate multiple classes and varying class sizes with sound-proofing. These should prove attractive to prospective students and allow for an enhanced practical experience for students, as there should be less need to run large lab classes and multiple rotations. The new facilities will also benefit students with specific access requirements.

76   The Panel noted that the move to the new Health & Life Sciences building would help alleviate some of the pressures associated with the increasing undergraduate student numbers. The new facilities would negate the need for double-teaching and also offer more office space for academic staff. The Panel had noted that some Personal Tutor meetings and other 1:1 meetings presently take place in the atria or other open spaces in the School's current buildings. The new building would also benefit from state-of-the-art laboratory facilities and upgrades to IT equipment in the teaching spaces. The building will also have new meeting spaces where staff and students can congregate and meet on an informal basis.

77   The Panel heard that the provision of personal study space was currently lacking and that the situation had been exacerbated by the refurbishment of the University Library. The Panel felt that the School could use its communication channels to inform students of the availability of alternative study spaces around the campus. The Panel noted that the problems of space would be ongoing and therefore encourages the School to also explore ways in which existing spaces can be better utilised in order to provide study spaces for students and more private spaces for confidential staff-student meetings **[advisable recommendation h]**.

78   Despite the space issues noted above, students reported feeling a sense of community at the University, and reported that they identified as students in Biological Sciences (if on larger programmes such as Biomedical Sciences) or as students of a particular discipline (if on smaller programmes such as Zoology). Field courses help to engender this sense of community, giving students the chance to bond in a different setting. However, the Panel noted that the field trips can be expensive and there are no funds to support these activities, leading to issues around the equity of student experience and opportunity.

Employability

79   The Wakeham review[2] highlighted general issues around the employability of graduates from the Biological Sciences, perhaps stemming from an identified desire amongst students of Biology for a deeper and broader knowledge of their subject over the recognition or development of transferable skills. The School acknowledges that, for at least the past four years, graduate employability has lagged behind that of other Schools within the University and with comparable programmes at other institutions. The School has taken measures to address issues around the employability of their graduates, most notably working with the Careers Services in delivering the "Key Skills in…". The modules, in part, replace the former "Professional Career Development" module at Part 2. The "Professional Career Development" module was unpopular with students as there was a perception that it reduced student choice of modules directly related to their programme. The "Key Skills in…" modules recycle and repackage some of the key content from the

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[2] www.gov.uk/government/publications/stem-degree-provision-and-graduate-employability-wakeham-review

"Professional Career Development" module and spread and intersperse career-related learning across Parts 1 and 2.

80   The Panel highly commended the fact that the School has also undertaken work in order to promote wider engagement with industrial placements in relevant employment environments. This includes introduction of placement versions of all undergraduate programmes and the development of a 10-credit placement module to encourage students to gain relevant work experience over the summer between Parts 1 and 2 or Parts 2 and 3. However, student engagement with these activities still remains relatively low (especially in comparison with the wider University). Where students have engaged with the opportunities, the high quality of the students has been acknowledged by hosting employers and the benefits of the experience championed by students.

81   The Panel noted that placement uptake had increased from 0.5% (3) students in 2013/14 and 0.8% (6) in 2014/15, to 2.8% (21) in 2015/16. The School estimates that approximately 70 students (across Parts 2 and 3) have taken this opportunity in both of the 2016/7 and 2017/8 sessions, and that this should act as a springboard for further growth in this area. The School sees the peer-marketing of placements as a key factor in further improving take-up. They have created Facebook groups to both highlight placement opportunities and to allow students to share their experiences of being on a placement. Students who have been on placements are also asked deliver presentations to their peers during Week 6.

82   The Panel noted that the School has appointed a member of academic staff to the post of Director of Placements and Employability (Dr Renee Lee). The Director's hard work and innovations have been a catalyst for the upturn in student uptake of placement opportunities. The students also appreciated measures taken to promote and celebrate the achievements of those who have undertaken placements through the presentations, poster sessions and social media initiatives **[good practice l]**.

83   Although the improved external links and a wider range of placements have delivered a promising improvement in uptake, undergraduate students who met with the Panel reported that there remains a perception in some quarters that placement opportunities are not well-advertised, and that many students remain uncertain as to the expectations and value of a placement. This is in spite of the fact that they thought that the range of placement opportunities on offer is attractive to students.

84   The School is using Week 6 to run careers events and showcases, including a "Meet the Professionals" event. These have been popular and well-attended by students. The School is also providing support to relevant student societies in running their own careers events.

85   The Panel found that some students view their programmes as semi-vocational, with a significant number seeking employment within the subject. In other instances, students seemed to be studying 'for the love of the subject' and gave little regard to later employment.

86   The Panel heard that the School has been working with Careers to raise undergraduate awareness of the breadth of potential occupations, both within subject and more generic. Key to this project is helping students identify and articulate the valuable transferrable skills they have acquired during their undergraduate careers.

87   The Panel noted that the integration of staff from the former School of Systems Engineering had brought with it significant knowledge of possible industrial partners. Further, the development of programmes in Biomedical Engineering affords opportunities for collaboration, especially with the NHS, which are being established with the Royal Berkshire Hospital.

88   The Student Submission indicated that most undergraduate students do not have an understanding of their development of transferrable and employability skills, and generally do not feel confident about employability. Further, students felt that there was a tendency to focus on career guidance, which is quite distinct. The Panel noted the positive impact of change, such as the

introduction of the "Key Skills in…" modules and the increased numbers of placement opportunities, but noted that the emphasis remains on practical approaches to job application such as CV writing. The Panel felt that the School should consider how students are encouraged to recognise the transferrable and employability skills they are developing during their programme of study and to document and reflect upon their professional development. The Panel noted that some of the preparatory work for the Curriculum Framework will address this skills mapping issue, but also would also urge the School to engage with Careers on this, calling upon their support and expertise.

89   The Panel noted that whilst students might be unaware of the skills that they had developed, employers were impressed with the array of skills that they exhibited. The Panel heard that employers valued the fact that students on placements were 'lab-ready' and able to take on key tasks with minimal supervision.

90   The Panel considered that the Personal Tutor system affords another opportunity to encourage students to recognise transferable skills, engage in discussions around employability, and help students consider possible careers earlier in their studies (see also 70f above).

91   The Panel felt that the School's employability strategy has been focused on increasing involvement in short or long-term placements. In spite of early positive signs, it is too early to assess whether this has been fully effective. However, the Panel was unsure whether the School had satisfactorily identified the underlying cause of poor employability amongst its students. As such, The Panel recommends that the School undertake an exercise in partnership with Careers to investigate the root causes of poor employment outcomes amongst their students. Such a review should consider:

    a.   Factors intrinsic to Reading students;

    b.   The national economic and employment context;

    c.   Student ability to recognise and articulate generic and transferable skills acquired during the degree;

    d.   Student awareness of opportunities; and,

    e.   Student confidence and ambition.

Further, the review should consider, with Careers, current good practice with regards to student employability from both within the School and beyond, in order to develop an action plan for adoption across the School.
[advisable recommendation i].

92   The Panel felt that the School could do more to identify and actively promote specific postgraduate employability routes (both academic and commercial). For example, the NHS (postgraduate) Scientist Training Programme has tight time-scales for applications and students may be in danger of missing them because they are unaware of the scheme.

Enhancement of quality and academic provision

93   The Panel noted with approval that the School is already in the process of reflecting at length upon its strengths and weaknesses in teaching and learning, and that there is considerable work in progress to improve its performance where needed, and to make the student experience more consistent across programmes and modules.

94   The School has a new and innovative staff peer mentoring provision, which asks staff to reflect on a specific aspect of their teaching performance each year and discuss it with their mentoring colleague. Staff have been enthusiastic about this new approach, which is cautiously welcomed by the Panel provided that it does not replace the consistent monitoring of the core elements of teaching and learning, such as classroom delivery.

95   The Panel was pleased to see that the School was taking an inclusive approach to the pedagogic and/or discipline-specific research interests of individual colleagues on teaching intensive contracts in terms of workload allocation to allow continuous personal/professional development (see also 51 above).

96   This inclusive approach has been enhanced by the creation of the new Teaching Enhancement Group (see also 10 above), open to all staff interested in developing and disseminating good practice in teaching and learning, whether or not they hold a recognised T&L role within the School. This provides a much-needed focus for colleagues to share ideas and to drive forward best practice not only within the School, but in the wider University and beyond. The Panel hopes that the School is able to encourage more colleagues to become involved in the Group.

97   Similarly, the Panel welcomes the School's appointment of a new Director of Teaching Enhancement to increase the School's current engagement with the University's Facilitating Learning and Teaching Achievement and Individual Recognition (FLAIR) scheme, and to encourage more senior colleagues to seek recognition at higher levels.

98   It is clear that the School pays close attention to statistical data such as NSS and PTES scores, and the Panel was encouraged to see that work on learning analytics is underway both to identify student support priorities and also to identify areas in which programme design needs to be improved (see also 49 above). There is a clear drive to improve NSS scores, although the Panel noted that the School was adversely affected by the RUSU boycott last year, which may have accounted in part for the fall in satisfaction reported. The 2017 PTES scores were also down. This may be as a result of organisational problems arising from a larger intake on one of the MSc programmes. Our conversation with current postgraduate students was largely positive, which suggests that these PTES results may have been an isolated instance, but the School will need to monitor future PTES feedback.

99   Not all students were persuaded that their voice was being heard when giving feedback on their learning experiences. For example, students who completed the Learning Gain survey felt that module evaluation came too late for any meaningful change for their own cohort, and that it was not always clear how the School had addressed the concerns raised.

100   However, it was clear that changes were made in the light of external examiner comments and module evaluation forms. The students interviewed by the Panel were very positive about the School's willingness to address problems identified by the students in, for instance, Student Staff Liaison Committees, including the moving of an examination and the extension of a deadline for an assessment. In some cases, where it was too late to make a change for the current cohort, an improvement was made for the following year. The School has also pursued a range of strategies in relation to student engagement, including changing the number and nature of SSLC meetings (ie introducing 'thematic' meetings and encouraging students to Chair meetings) and involvement with the UG Engagement Survey (UKES), taking part in the pilot for this.

101   The Panel also noted that the School is working to improve closure of the feedback loop, for example, by holding a workshop to discuss the student responses to the Learning Gain survey and to respond to comments. The opportunity afforded to External Examiners to meet with the students is also commendable. The Panel recommends that the School build upon its efforts to take account of student feedback by engaging students as partners in the future development of its programmes in the ongoing Curriculum Framework Review **[advisable recommendation j]**.

Main characteristics of the programmes under review

102   The Panel found the School to be student-centred, with good student staff relationships. The School offers a good range of well-planned programmes that provide significant breadth and scope across the whole subject area. Students are exposed to excellent laboratory and fieldwork experiences, which equip them very well for both their study and the world of work. They are also

exposed to high-quality, research-led teaching and the integration of research skills and experience in curricula.

Conclusions on innovation and good practice

103 The Panel identified the following as representing particularly good practice:

    a.   The recent addition of two relatively new groups with a focus on T&L matters to the 'standard' committee structure, viz. the Teaching and Learning Leadership Group and the Teaching Enhancement Group.

    b.   The introduction of assessments at undergraduate and postgraduate levels which require students to engage with academic journals (eg 'Seminars in Biology' where undergraduate students wrote a letter to Nature and the requirements for postgraduate students to produce a paper in the house-style of particular journals).

    c.   Research-informed programmes are delivered by passionate staff, leading to an enthused and engaged student body at both the undergraduate and postgraduate levels.

    d.   The extensive use of practical laboratory and field experience in both undergraduate and postgraduate programme provision, bringing the subject to life and embedding key transferable skills.

    e.   Introduction of the "prescribed routes"/recommended modules, which aim to alleviate pressures around timetabling and module selection.

    f.   Activities to meet the needs of the diverse nature of their cohorts. These activities include the development of a one-year Science Foundation Programme as a route to the degree (see j); the introduction of Key Skills modules at Part 1 and Part 2; work being done on learning analytics; peer assisted learning; and drop-in sessions.

    g.   The use of social media (including Facebook Groups and Instagram) and other alternative communications channels to help foster student engagement and further reach into student communities.

    h.   Taking an inclusive approach to individual teaching-intensive colleagues' interests in terms of pedagogic and/or discipline-specific research through workload allocation to allow continuous personal/professional development.

    i.   The School is sensitive and responsive to student needs; we found evidence of genuine care and consideration around student support by academic staff in the School, which leads to a culture of teaching and learning maintenance and enhancement.

    j.   Introduction and success of the new Science Foundation Programme, including meeting the challenges of high student numbers and supporting the Foundation Programme Director (who is in another School) in the delivery of the programme.

    k.   The continuing strong recruitment in a competitive market, due, in part, to the success of Open and Visit Days (and staff and student participation therein).

    l.   The appointment of a specific member of staff to oversee placement provision and support, and the associated school-wide efforts to increase student engagement with placement opportunities as a means of enhancing employability skills.

Conclusions on quality and standards

104 The Panel has concluded that the quality and standards of the programmes reviewed are appropriate.

Conclusions on new degree programme proposals

105 The Panel received no submissions with regards to new programme proposals.

Recommendations

106 The Panel recommends to the University Programmes Board that the following degree programmes taught by the School of Biological Sciences are re-approved to run for a further six years, or until they are taught out:

- BEng Artificial Intelligence*
- BSc Biochemistry
- BSc Biochemistry with Foundation
- BSc Biochemistry with a Professional Experience
- BSc Biological Sciences
- BSc Biological Sciences with Foundation
- BSc Biological Sciences with a Professional Experience
- BEng Biomedical Engineering
- BEng Biomedical Engineering with a Professional Experience
- BSc Biomedical Sciences
- BSc Biomedical Sciences with Foundation
- BSc Biomedical Sciences with a Professional Experience
- BEng Cybernetics*
- BSc Ecology & Wildlife Conservation
- BSc Ecology & Wildlife Conservation with Foundation
- BSc Ecology & Wildlife Conservation with a Professional Experience
- BEng/MEng Electronic Engineering*
- BSc Microbiology
- BSc Microbiology with Foundation
- BSc Microbiology with a Professional Experience
- BEng Robotics*
- BSc Zoology
- BSc Zoology with Foundation
- BSc Zoology with a Professional Experience
- MEng Biomedical Engineering
- MEng Biomedical Engineering with a Professional Experience
- MEng Artificial Intelligence*
- MEng Cybernetics*
- MEng Electronic Engineering*
- MSc Molecular Medicine
- MSc Species Identification and Survey Skills
- MSc Plant Diversity
- MEng Robotics*
- MSc Wildlife Management & conservation
- MSc by Research Biomedicine
- MSc by Research Entomology

*Programmes currently being taught out

107 The report will categorise any issues as follows, in order of priority:

Those areas where the Review Team believes it is **necessary** for action to be taken urgently to safeguard the standard of provision;

Those areas where it is **advisable** that the issues be addressed as soon as possible;

Those areas where it is **desirable** that the issue be addressed over a longer time span.

108 The Panel has made the following recommendations which must be addressed as a condition of re-approval:

The Panel makes the following recommendations to the School:

Necessary

There were no necessary recommendations.

Advisable

a. The membership and terms of reference for the two new Teaching and Learning Groups should be reviewed and updated in order to encourage accountability and to make clear the links between committees/groups with T&L oversight within the School. This would help ensure broader membership of the groups and improve their impact.

b. To use the opportunity of the Curriculum Framework review to ensure clarity and comparability within and across each undergraduate programme of the progressive development and assessment of skills areas e.g. research skills, practical skills, critical skills and employability skills.

c. Undergraduate assessments should be revised as part of the Curriculum Framework programme review to ensure that:

    i. they are of the appropriate level;

    ii. they allow students to demonstrate they have met the programme and modular learning outcomes, including employability skills;

    iii. the assessment burden on staff and students is reduced, and the timing of assessment is improved; and,

    iv. assessments are carefully scaffolded so that summative assessment in one Part of the programme can act as formative assessment for the following Part.

d. Consider the assessment load per module and ensure that 10 credit modules only employ more than one assessment in exceptional circumstances.

e. Give equal/appropriate weighting to assessed coursework where it is used alongside examinations.

f. Work with students as partners to develop a coherent feedback policy and guidelines for staff and students (as detailed in 38 above).

g. Review the criteria used for assigning undergraduate students to Personal Tutors, tutor groups, and to "Key Skills in…" modules.

h. Whilst the development of the new Health and Life Sciences Building is ongoing, the School should explore ways in which existing spaces can be better utilised in order to provide study space for students and better spaces for confidential meetings between staff and students.

i. Undertake an exercise in partnership with the Careers to investigate the potential underlying root causes of current employment outcomes and together with the Careers to develop an action plan to address the issues for adoption across the School (as detailed in 91 above).

j. Build on the existing good practice of taking student feedback into account by engaging students as partners in the future development of programmes.

Desirable

k. Continue to monitor the efficiency of postgraduate provision (ie numbers on programmes, modules and student destinations) to ensure that they are sustainable.

l. Review and enhance the Personal Tutor role, taking note of concerns around support for both staff and students in implementing the role.

The Panel also makes the following recommendations to the University:

Necessary

m. Undertake a review of the arrangements for administrative support for the Science Foundation Programme, with a view to appointing a dedicated Programme Administrator for this activity.

Advisable

n. Provide marketing intelligence and support to the School to help enhance activities around the recruitment of International students.

o. Facilitate consultation between Estates & Facilities, IT and the School to identify and address immediate issues around the provision and suitability of IT and A/V equipment in classrooms (eg projector screens, whiteboards, technology tables) and plan for the mitigation against such issues arising in the new building.

109 The Panel does not have a recommendation to the University Programmes Board as to whether any proposal(s) for new programmes should be approved, as this is not applicable.

February 2018