

PERIODIC REVIEW OF COMPUTER SCIENCE

Reviewing programmes delivered by the Department of Computer Science in the School of Mathematical, Physical and Computational Sciences

INTRODUCTION

1. An internal review of programmes in Computer Science was held on 14 and 15 March 2019. The members of the Panel were:
 - Dr David Carter, Head of International Study and Language Institute (*Chair*)
 - Dr Siobhán North, Senior Lecturer in Computer Science: University of Sheffield (*external member, subject specialist*)
 - Professor David Walker, Professor of High Performance Computing: Cardiff University (*external member, subject specialist*)
 - Glynn Seymour, Digital and Local Application Development Manager: Bayer Plc (*external member, industry*)
 - Dr Luke Elson, Lecturer: School of Humanities (*internal member*)
 - Dr Chloë Houston, Associate Professor: School of Literature and Languages (*internal member*)
 - Briagha Barnes, MChem Chemistry, School of Chemistry, Food and Pharmacy (*student member*)
 - Richard Sandford, Senior Quality Support Officer: Centre for Quality Support and Development (*Secretary*)
2. The Panel met the following:
 - Professor Ben Cosh (Head of School)
 - Dr Giuseppe Di Fatta (Head of Department)
 - Dr Karen Poulter (School Director of Teaching and Learning)
 - Dr Joy Singarayer, School Director of Academic Tutoring
 - Dr Lily Sun, Undergraduate Programme Director
 - Dr Tom Thorne, MSc Programme Director
 - Professor Richard Mitchell, School Director of TEL and Departmental Exams Officer
 - Dr Huizhi (Elly) Liang, Student Engagement Coordinator
 - Dr Pat Parslow, Deputy School Director of Academic Tutoring and Placement and Employability Tutor
 - Dr Fred Stahl, Previous Admissions Tutor
 - Dr Martin Lester, Current Admissions Tutor
 - Dr Varun Ojha, Co-convenor of the Final Year Project
 - Dr Christopher Maynard, Associate Professor in Computer Science

- Alex Owen, Senior Programme Administrator, Student Support Centre
 - Christine Lee, Programme Administrator in the Student Support Centre
 - Sandra Ilett, Placement Co-ordinator, Careers & Employability
 - Anne Delausun, Careers Consultancy Manager, Careers & Employability
 - Neil Blanchonnet, Senior IT Business Partner, IT
3. The Panel met students who represented the following degree programmes:
 - BSc Computer Science
 - BSc Computer Science with Industrial Year
 - MSc Advanced Computer Science (Part-time)
 4. The Panel met a recent graduate from the BSc Computer Science, and a representative from Microsoft.

GENERAL OBSERVATIONS

5. The Review Panel met with a range of staff from across the Department, and senior leadership from the Department and School. The staff were engaged with the process and made the Panel feel very welcome. The review benefitted from a comprehensive and well-organised Blackboard organisation, and any additional information requested by the Panel was quickly supplied by the Department. The Panel found the resources provided invaluable in their review of the Department's activities. The Panel welcomed the opportunity to tour the facilities, which were available to all students. The Panel extends its thanks to the Department for its hospitality and engagement with the process.
6. The Panel was pleased to meet and question current undergraduate and postgraduate taught students. They found the students to be passionate about their subject and enthusiastic about the opportunities afforded by the Department. The students raised a number of issues during the review, but it was clear that this was as a result of a genuine affection for the Department, and a desire to see it go from strength to strength. The Panel wishes to express its thanks to these students, and to the students who contributed to the Student Submission, for their valuable input into the Review.
7. The Panel met with a recent alumnus and an employer. They both attested to the strength and reputation of the Department's offering. The Panel was grateful for the insights provided during their discussions with both, and thanks them for their generous engagement with the process.
8. The Panel heard that plans for delivery of a collaborative programme in computer science in the NUIST-Reading academy were in preparation for student entry in Autumn 2019.¹ The Panel was mindful of the fact that the Department has undergone a substantial period of change and upheaval, and that this activity will have significant impacts on staff workloads in the UK. The Panel recommends that planning for the delivery of the programme should take due regard of resource and staffing implications **[advisable recommendation h]**.
9. The Panel thought that, having undergone a period of considerable change and restructuring, as well as administrative alterations implemented in the University in 2016, the Department is to be commended for having taken a number of steps to enhance and improve the programmes that it offers its students. The Department was formed in August 2016, following the closure of the School of Systems Engineering. As part of the University's decision to close Systems Engineering it was agreed that the Department would be located within the School of Mathematical, Physical and Computational Sciences and that the BSc Information Technology (plus the Industrial Year variant) would be withdrawn from its offering. As part of the restructuring

¹ The University Programmes Board has subsequently approved the programme for entry in the Autumn 2020.

there were a number changes to staffing, with some staff forming the new Department, others joining other Schools and some being made redundant.

10. The Department benefits from strong leadership and a hard-working team of academic colleagues. New staff feel well supported in their roles and there is evidently a sense of community amongst the academic staff. It should be noted that the Department has only recently reached its full complement of teaching staff. As such, the Department has a high number of new staff amongst its faculty.
11. The Panel noted that staff morale, which has inevitably been impacted by this period of change, appears to be good, and students report their appreciation of their academic and support staff, who are striving to provide them with a high-quality teaching and learning experience. Staff showed a positive attitude throughout the review and there was significant evidence that morale is improving within the Department **[good practice a]**.

Committee structures

12. The Panel was satisfied that the committee structures in place were appropriate and effective for the quality management and enhancement of the programmes. The Panel found the committees to be well organised with clear paper trails and lines of responsibility.
13. The Panel felt that the Department could do more to ensure that the student voice is better represented when considering decisions directly affecting them. To this end it recommends that students should be included in all working groups relevant to them **[advisable recommendation b]**.
14. However, the Panel agreed that the Student-Staff Liaison Committee works well and has good engagement from the student body. The SSLC could be better leveraged in the working relationship with key professional functions (see 50 below).

Programme design

15. The Panel noted that External Examiners found the programmes to be in line with the relevant subject benchmark statements² and are aligned with the qualifications descriptors set out in the Framework for Higher Education Qualifications.
16. The Panel found that the programmes exhibit a solid and traditional curriculum with strong vocational elements **[good practice b]**.
17. The external panellists reported that the undergraduate programmes reviewed have a traditional computer science basis but also include modules on subjects of topical research interest, such as Artificial Intelligence, Data Mining, and Neural Networks.
18. The Panel noted that some modules reflected the research interests of the Department, and felt that this should be encouraged as it improves student engagement and employability. It also allows staff to deliver material that is fully informed by the latest research.
19. The Panel noted the programmes could be further enhanced through the inclusion of web programming (i.e., the use of software technologies such as HTML, PHP, JavaScript, etc.). The Panel noted that parallel and distributed computing, which is currently covered only in a 10-credit module, might benefit from broader coverage.
20. The Panel found that the Computer Science with Industrial Year programme is popular with students and yields very good employment outcomes. The programme is well-supported by

² Subject Benchmark Statement: Computing - www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-computing-16.pdf and Subject Benchmark Statement: Computing (Master's) - www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-masters-degree-computing.pdf

academic staff and the Careers Centre and runs efficiently. There is some evidence that students are also interested in shorter term placements.

21. The Panel heard that students would like to be given more opportunities to develop business and entrepreneurship skills, and links with the Henley Business School should be investigated to provide this (see also 48 below).
22. The MSc in Advanced Computer Science allows students to engage with a good selection of topics that are intellectually stimulating and provide a good basis for a professional computer-oriented career in industry or research. The external panellists found it surprising that the programme does not attract more students, as similar programmes at comparator universities have large numbers of students (see also 42 below).

Assessment and feedback

23. The Panel determined that the Department has many areas of strength in relation to its current methods of assessing student attainment and delivering feedback on assessments to students. These include the diverse range of assessment methods, timely return of clear feedback, innovative practices in assessment design and participation in University pilots. However, the Panel was also able to identify a number of opportunities for improvement, particularly in the clarity of marking criteria and consistency in the quality of feedback. The Panel recommends that the Department works to ensure that module learning outcomes and assessment contribute to programme aims in a structured and purposeful way, which is easily understood by students **[advisable recommendation f(i)]**.
24. With regards to assessment, the programmes benefit from a diverse range of assessment methods, which help students to develop their learning and skills, and efforts are made from the beginning of the programme to encourage students' familiarity with these various methods.
25. The Panel found that there is much good practice and innovation to observe on individual modules, including opportunities for students to devise their own assessment method and undertake self-assessment.
26. The Panel found the marking schemes for a number of Masters modules (e.g. Big Data Analytics, Cloud Computing) to be exemplary, providing a level of clarity and detail that supported both staff and students **[good practice c]**.
27. The Panel were pleased to note the Department's timely return of feedback, whereby they consistently meet or better the 15 day turnaround time deadline **[good practice d]**.
28. The Panel were pleased to note the Department's engagement with the pilot of the provision of feedback on exams, and its proactive commitment to deliver such feedback to their students **[good practice e]**.
29. Additionally, the Panel was pleased to note the use of a variety of modes for feedback (including group feedback to a module cohort and small-group tutorials for formative feedback, for example, as well as individual feedback).
30. The Panel noted that the Department could do more to communicate these successes to students, so as they are aware of the excellence of provision in such areas and to further develop the sense of community and shared endeavour. For example, the Department could highlight successes in the swift turnaround of feedback via posters or on Blackboard. In highlighting this success and linking it to responses to student demand they should see an improvement in the NSS score for question 10 ("Feedback on my work has been timely"). However, the Department should be mindful that such claims may need to be qualified, especially as the return of feedback on formative work is not as swift as that for summative.

31. The Panel noted that student evaluations and NSS scores indicated that there were some weaknesses in assessment and feedback which require attention. In reviewing work and speaking with students, the Panel felt that the Department could profit from discussing and developing policies for the provision of clear, useful and student-focused feedback **[advisable recommendation e]**.
32. Firstly, students noted a bunching of deadlines, particularly at the end of term which caused particular pressure points. The Department is encouraged to consider this issue as part of its ongoing curriculum review and to take measure to streamline assessment deadlines where possible **[advisable recommendation f(ii)]**.
33. More significantly, the Panel noted that criteria for assessment are not currently standardized across modules. For example, some modules give brief grade descriptors in place of a marking scheme, while others give detailed assessment criteria, sometimes including a breakdown to show where and how marks may be achieved. More detailed criteria are obviously more useful to students in understanding what is required of them for a given assessment. The Department is encouraged to rethink assessment criteria so that they are owned and understood by students, and properly address what is expected of them in any given assignment **[advisable recommendation d]**.
34. The Department may also wish to think about whether marking criteria are used adequately in teaching, and at an early enough stage of the module in question. At present there is sometimes a lack of critical engagement with the assessment criteria, or even a lack of comprehension (such as the difficulties in understanding criteria reported by students in relation to the MSc), which suggests that students may need more help in fully understanding the relevant task. Placing the assessment briefs in the Programme Handbook would go some way to addressing the issue of their timely introduction.
35. The Panel sampled a small selection of feedback per module, but was able to look at a wide range of modules across the programmes. While there is much good practice to be observed the Panel found some feedback to be brief and perfunctory. This brevity was often due to the nature of the particular assessment, but at other times the level of feedback provided seemed inadequate given the size and nature of the assessment. The Panel also noted that much of the feedback could be more strongly focused on the needs of the student. Where a paragraph of qualitative feedback was given in response to students' conference papers for a Part 2 module, for example, in the case of weaker students it focused entirely on the negative qualities of the assessment, and was expressed rather brusquely. Colleagues should be encouraged to think about the impact of their feedback on students and to seek to include positive statements as well as negative ones. The Department may also like to think about how it encourages colleagues to provide feedback that feeds forward into the next assessment or, where appropriate, into work for another module **[advisable recommendation e]**.

QUALITY OF LEARNING OPPORTUNITIES OFFERED BY THE PROGRAMMES

Teaching and learning

36. The Panel found that, in general, the quality of teaching in the undergraduate and taught postgraduate programmes is of a high standard.
37. The Panel heard that there have been a small number of modules where students feel that the delivery has not been very engaging. The Panel felt that this may be an issue with new lecturers who have narrower experience of teaching in higher education. The Department contains a

Senior Fellow of the HEA and five FHEAs, and a number of new staff are taking the University training programme that leads to a HEA qualification. The Department is thus well-placed to support new staff to develop their teaching practice.

38. The Panel heard about the School's forums dedicated to the dissemination of best practice and innovations in teaching and learning, and about engagement with this activity by departmental staff **[good practice f]**.
39. However, whilst this is an excellent activity at school level, it is not mirrored at a department level. The Panel felt that the Department could further pursue a culture of teaching excellence through the identification and sharing of best practice. As well as the School T&L forums, local activities could support this activity, for example through structured opportunities for peer review and events such as teaching and learning seminars and away days **[recommendation g]**.
40. The Panel noted that in addition to traditional lectures, students are also taught in a lab-based setting, particularly in modules teaching programming.
41. The Panel found that students have adequate opportunities for learning how to write reports (for example, in their individual report), but it was not clear how much guidance or support they receive in this area. The Panel felt that the development of verbal presentation skills is also an area that could be better supported. However, the Panel noted that the value of students learning about group working was remarked on by employers and graduates, where soft and technical skills are both important **[good practice g]**.

Student admission, retention, progression and attainment

42. The Panel noted that recruitment of postgraduate students is very low (10 recruited in 2015/16, 7 in 2016/17 and 5 in 2017/18). In light of these low figures the Panel recommends that the Department reviews its taught postgraduate provision. There may be an argument to introduce an Integrated Masters programme, which would bolster numbers as students move from their undergraduate parts to the level 7 component of their programme. The Panel felt that the use of 10 credit modules at postgraduate level might be unappealing, in not giving students the depth of study that they are seeking. The Department should investigate ways to maintain the breadth of offering, while providing opportunities for deeper engagement with the subjects. Finally, the Panel recognises that much of the recruitment activity is outside of the Department's gift and so recommends that the Department seeks the support of Marketing, Communications and Engagement to explore how recruitment to the programme might be improved (and whether there would be a market for an Integrated Masters) **[desirable recommendation i]**.
43. The Panel found that the senior management in the Department and the wider School makes good use of student management data. However, it was felt that in their efforts to improve student engagement they could do much more to identify and utilise tools for attendance monitoring **[advisable recommendation a(ii)]**.
44. The Panel noted that, historically, the Department has struggled with low retention rates amongst its undergraduate students. The Department has undertaken a number of steps to try and address this issue, both in terms of the student experience in specific modules, and through more general student support arrangements. The Department has highlighted retention and attainment and one of its key areas of focus, with the Head of School and SDTL leading staff sessions to discuss the issues and engage staff in searching for solutions. The Department has provided support for staff on modules that have consistent student underperformance, encouraged modifications to content or delivery where applicable and, in some cases, reallocated responsibilities within modules.
45. Key mechanisms identified by the Department for improving retention include improving student engagement (through developing a sense of community, providing better support for

students who enter with BTEC qualifications, and managing fitness to study procedures in a more timely way).

46. The Panel noted these aspirations and recommends that the Department works to develop more robust mechanisms for the identification and support of less engaged students by formalising best practice for arranging academic tutorials meetings and by taking a more systematic approach to the determination and communication of office hours (the Panel had found a wide variance in practice in these areas) **[advisable recommendation a(i) & a(iii)]**.
47. The Panel noted that there had been a sharp increase in attainment rates between 2016/17 and 2017/18 (the proportion of 1sts and 2:1s up to 77% from 64% in the previous session). In part, this could be attributable to the personalised email sent to Part 2 students in January that outlines what average they need to obtain a degree class equal to or higher than their Part 2 grade. The Panel felt that this was a hugely beneficial innovation, and this was appreciated by the students they spoke with **[good practice h]**.
48. The Panel noted that students who undertake the "...with Industrial Year" version of the undergraduate programme has significantly better degree outcomes than those who do not (with 95% of students on the "...with Industrial Year" version achieving a 1st or 2:1 in 2016/17 and 2017/18 versus 43% in 2016/17 and 64% in 2017/18 of those on the standard programme). The Panel recommends that the Department considers ways to engage other students by encouraging take up of short placement opportunities and building in professional skills into the programmes. The Department should consider how to further integrate professional skills in the curriculum, and identify ways to leverage support from Henley Business School and the Careers Service **[advisable recommendation f(iii)]**.

Learning environment and student support

49. The Panel found that the Department provides students with good resources to aid their learning in the form of vast computer labs, a variety of specialist software, and excellent placement support. The facilities are appreciated by students, which is reflected in the improvement of relevant NSS scores from 2017 to 2018.
50. The Panel noted concerns raised by the Postgraduate Student Representative about the PC Laboratories and IT support (some of which were echoed in the Self-Evaluation Document). The Panel were reassured that the issues highlighted (around the timely availability of resources, and support to address issues with software) had been addressed by IT through its ongoing work to improve their services. However, the Panel was mindful that the solutions put in place by IT might not have been fully communicated back to the student body. It was felt that it would be helpful if the Department were to consider extending an invitation to the IT Business Partner to join the membership of the undergraduate and postgraduate Student-Staff-Liaison Committees **[desirable recommendation j]**.
51. The Panel noted that when students are searching for placements as part of the "...with Industrial Year" version of the programme, it is evident that the Department offers a wealth of support, as well as being well supported by the Careers Service, and as a result have received exceptional feedback in this area **[good practice i]**.
52. Students expressed a desire to make the learning environment more inspiring by effectively reflecting the type of setting they might encounter in industry. It is therefore recommended that staff and students work together to provide the available spaces with a more welcoming feel. Although the building offers certain limitations concerning the layout, some innovative methods for more efficient use of space would help to improve the student learning experience while simultaneously allowing students and staff to work on building a community (see also 63 below).

53. Students generally perceived that their academic tutors are active, and their lecturers approachable, which means that there is already a basis for this type of discussion to start. The Panel noted that the set up in the Polly Vacher building sees academic staff placed on the first floor, with student spaces (e.g. computer labs) largely on the ground floor. The Panel felt that staff and students should work together to think innovatively about how teaching spaces and other shared spaces are distributed in the building, with a view to creating a better integrated academic community of staff and students **[advisable recommendation c]**.
54. Students reported feeling well supported and knew where to go for additional support. Support outside of the Department was well signposted, with information provided during induction, in Programme Handbooks and by Academic Tutors. Students knew where to access support and were happy to do so. In part, this is due to the work done by the Department not only in signposting additional services, but in working with central support services to ensure that students are well supported throughout their programme **[good practice j]**.

Employability

55. The Department offers students on the undergraduate programmes industrial experience through one-year maxi placements. These are well received by participants and employers, and offer opportunities to build skills that may be difficult to replicate in the academic environment. Most participants feel this was a valuable part of their overall experience, and considerable attention is paid to preparing students for placement. It adds further value with the relationships built by the Placement Tutor and/or Coordinator, both for industry practice feedback and for continuing the cycle of placement with future year's intakes **[good practice k]**.
56. The Panel noted that programmes continue to attract accreditation from the British Computer Society (BCS). The accreditation is valuable for students in seeking careers in computer science and software engineering. The Department pays for student membership of the BCS and the accreditation allows students to fulfil the necessary academic achievement for personal chartered status with BCS, if desired.
57. A recent introduction of professional certifications into the curriculum has been well received by all parties, and offers scope for further development to act as a recruitment enticement. The development of Huawei professional certifications in the Masters programme, specifically AI, should improve its employability prospects **[good practice l]**.
58. The Panel noted that the Department continues to run an Industrial Advisory Board of professionals from relevant companies. The IAB operates according to the following mission statement:

'The School of Systems Engineering³ IAB is collaboration with international companies on strategic and operational issues, matching professional practice and academia, with the primary goal of improving the employment competencies and choices of Reading undergraduates.'
59. The Board continues to meet virtually and in person on a regular basis, and reviews course content in detail so as to offer guidance on current industry trends and expectations of new graduates.
60. Graduates of the Department are highly employable, as evidenced in the DLHE (Destination of Leavers from Higher Education) results (students "in work and/or study" stood at 90.9% in 2013/14, 84% in 2-14/15, 91.7% in 2015/16 and 71.9% in 2016/17). This can be seen as an

³ The School of Systems Engineering was the former home of the Computer Science programmes. Upon its closure in 2016 activities were relocated in the new Department of Computer Science (as part of the School of Mathematical, Physical and Computational Sciences) and the School of Biological Sciences.

indication of the employer engagement on the levels detailed above, and the considerable efforts of the Careers Service.

ENHANCEMENT OF QUALITY AND ACADEMIC PROVISION

61. The Panel noted that staff regularly share expertise at School teaching forums. The Panel was pleased to see that new staff have been well inducted into life in the Department and the wider University, with support from experienced mentors, access to colleagues from across the School and enthusiastic engagement with the University's Academic Practice Programme **[good practice m]**.
62. As this report makes clear, the programmes offered by this Department are of an appropriate standard and produce students who are doing well according to performance indicators and who are clearly highly employable.
63. As the Department develops it will wish to continue to embed and strengthen its sense of its own identity and community. Students report a strong affiliation with Reading and with their departmental home, but more could be done to make use of the space available in order to foster and strengthen this affiliation and develop a sense of academic community. On a practical level, posters and displays could be used to showcase colleagues' and students' work, and to highlight the advantages of Reading as a home of computer science. Students could be given a (small) budget and a brief to improve, and perhaps redecorate, lab spaces. Both staff and students regret the loss of a student common room, and the Department could consider whether such provision could be made using its current space. The prospect of covering over the courtyard area is appealing, but likely to be a more long-term solution. Again, students should be involved in this process and consulted on how best use may be made of current space. Some colleagues report having begun initiatives to encourage staff-student engagement (such as clubs, events and informal seminars), and these activities are to be applauded and supported. The Panel felt that the Head of Department is proactively exploring solutions to the space issue, as well as providing effective leadership in other areas **[good practice n]**.
64. The Board noted that student engagement is also an indicator of the sense of academic community in the Department. Attendance at teaching is an important aspect of student engagement, and the Department should look at how best to monitor student attendance (see also 43 above), and whether information procedures could be put in place to contact and support students whose attendance is problematic. Such measures can often provide a useful intervention for students who may be struggling. Engagement with the academic tutorial system is also important and thought could be given to encouraging students to attend tutorial meetings, and staff to record these meetings on RISIS (see also 46 above). The adoption of office hours, when students know staff are available in their offices (or in labs) on a drop-in basis, would also enable students to contact staff on a more informal basis (see also 46 above). The Department should also, when the opportunity arises, seek to engage fully with lecture capture and other technologies as they are rolled out across the University **[advisable recommendation a(iv)]**.

MAIN CHARACTERISTICS OF THE PROGRAMMES UNDER REVIEW

65. The Department was making preparation for a celebration of 50 years of Computer Science at Reading. In keeping with this, the Panel found evidence of a solid undergraduate programme with

a traditional curriculum covering all core subjects and informed by faculty research. The postgraduate offering is further informed by the research interests of staff. Students are given an excellent grounding in both practical and theoretical skills. The offering prepares students for the world of work, and benefits from strong links with industry.

66. The Department's facilities and equipment provide excellent support for students' learning. The computer labs are well-equipped and maintained, providing 24-hour access for students throughout their course. Alongside these facilities students have remote access to a rich suite of software applications and storage.
67. In spite of being a new Department within the School, the Panel found that the relationship between the School and Department was already very mature and fruitful. The Panel found the Department to be truly integrated within the workings of the School. Working together to find solutions to common problems, sharing experiences and expertise and finding ways to nurture a mutually beneficial relationship between the three Departments.
68. The Panel saw a Department with a dedicated faculty composed of a mix of early career professionals and more experienced colleagues, who all endeavour to provide the best outcomes for their students. The mix of experience and innovation is a benefit to all stakeholders.

CONCLUSIONS ON INNOVATION AND GOOD PRACTICE

69. The Panel identified the following as representing particularly good practice:
 - a. Staff showed a positive attitude throughout and there was significant evidence that morale is improving within the Department. [paragraph 11]
 - b. The programme exhibits a solid and traditional curriculum with strong vocational element. [paragraph 16]
 - c. The marking schemes supplied for a number of the Masters modules (e.g. Big Data Analytics, Cloud Computing) were felt to be exemplary. [paragraph 26]
 - d. The 15 day turnaround target times are consistently met or bettered. [paragraph 27]
 - e. The Department has been proactive in offering exams feedback (including participation in the pilot). [paragraph 28]
 - f. The School's sharing of best practice through teaching and learning forums. [paragraph 38]
 - g. The Department's use of group work is enjoyed by students and valued by employers. [paragraph 41]
 - h. The email indicating how students are performing and what they need to do to achieve their desired degree outcomes. [paragraph 47]
 - i. The support offered for Placements. [paragraph 51]
 - j. The Department's signposting and engagement with central support services – Maths Support Centre etc. [paragraph 54]
 - k. The year in industry works well and is well received by students and employers and is very well supported by the Careers services. [paragraph 55]
 - l. The development of industrial certification and their embedding in module. [paragraph 57]
 - m. The new staff have been well supported and inducted into life in the Department and wider University. [paragraph 61]

- n. The Head of Department is proactively exploring solutions to the space issues and providing effective leadership in other areas. [paragraph 63]

CONCLUSIONS ON QUALITY AND STANDARDS

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

CONCLUSIONS ON NEW DEGREE PROGRAMME PROPOSALS

71. The Panel received no submissions with regard to new programme proposals.

RECOMMENDATIONS

72. The Panel recommends to the University Programmes Board that the following degree programmes taught by the Department of Computer Science are re-approved to run for a further six years:
- BSc Computer Science
 - BSc Computer Science with Industrial Year
 - MSc Advanced Computer Science
73. 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.
74. The Panel has made the following recommendations which must be addressed as a condition of re-approval:

The Panel makes the following recommendations:

Necessary

There were no necessary recommendations.

Advisable

- a. The Department should develop more robust mechanisms for the early identification and support of less engaged students, by:
- i. Formalising best practice for arranging academic tutorial meetings; [paragraph 46]
 - ii. Working with the University to identify tools for attendance monitoring; [paragraph 43]
 - iii. Taking a more systematic approach to the determination and communication of office hours; and [paragraph 46]

- iv. Engaging, when the opportunity arises, with lecture capture and other technologies. [paragraph 64]
- b. The Department should include the student voice in all matters relevant to them, communicating efficiently and closing the 'feedback loop' wherever possible. [paragraph 13]
- c. Academic staff and students should think innovatively about how teaching space and shared space is distributed in the building, with a view to creating a better integrated academic community of staff and students. [paragraph 53]
- d. The Department should ensure that clear assignment briefs are provided for all assessments and that they are detailed in Programme Handbooks as a matter of course. [paragraph 33]
- e. The Department should discuss and develop policies for the provision of clear, useful and student-focused feedback. [paragraph 35]
- f. It is understood that the current curriculum review includes a global look at programme aims and outcomes. Within this project the Department should:
 - i. Ensure that module learning outcomes and assessment contribute to programme aims in a structured and purposeful way, which is easily understood by students; [paragraph 23]
 - ii. Consider the calendar of assessment for each cohort, avoiding unnecessary bunching of deadlines and other pressure points in the academic year; and [paragraph 32]
 - iii. Consider how to further integrate professional skills in the curriculum, and identify ways to leverage support from Henley Business School and the Careers Service. [paragraph 48]
- g. The Department should pursue a culture of teaching excellence through the continued identification and sharing of best practice; this should include structured opportunities for peer review and events such as teaching and learning seminars and away days. [paragraph 39]
- h. The Department should plan for the delivery of the BSc Data Science at the NUIST-Reading Academy with due regard for the impact on staffing and other resource implications. [paragraph 8]

Desirable

- i. The Department should review its postgraduate taught provision, and: [paragraph 42]
 - i. Consider the introduction of an integrated master's programme;
 - ii. Re-consider the use of 10 credit modules within the MSc programme; and
 - iii. Draw in MCE support to investigate how recruitment to postgraduate programmes might be improved.
- j. The Department should consider including its IT Business Partner as a member of the undergraduate and postgraduate staff-student liaison committees. [paragraph 50]