

Royal Society of Chemistry Degree Accreditation in Exceptional Circumstances – update August 2020

The Royal Society of Chemistry understands that departments will need to make adjustments to the next academic year (2020/21), particularly where practical sessions, project work, placements and assessment are concerned. This notice, and the accompanying answers to frequently asked questions, are designed to provide updated guidance as to how to maintain accreditation standards whilst making reasonable changes to accredited programmes.

Accreditation requirements should be preserved where possible but should circumstances beyond the department's control not permit this, for example where social distancing in a laboratory is required, some temporary deviation from accreditation requirements is likely to be acceptable. The Royal Society of Chemistry will expect departments to communicate the measures taken to preserve the overall standards to us.

Practical Work

The conditions for accreditation require students to develop a range of practical skills. This can be achieved by exposing students to an appropriate variety of different experiments synthetic and measurement techniques, and by allowing them to spend sufficient time in the laboratory. Our criteria do not define a list of skills, beyond the broad categories given in the UK QAA Benchmark Subject Statement. Equally, we do not prescribe a set of experiments or techniques. This allows departments to develop distinctive practical courses that reflect their own strengths and are appropriate for the resources available. Instead, assessors use their judgement when reviewing practical courses to ensure that programmes meet this key requirement. For undergraduate bachelors and integrated masters programmes, the minimum practical hours provide the Committee for Accreditation and Validation with some confidence that students have spent sufficient time in the laboratory to experience these techniques and, crucially, to work safely and competently and to prepare students for either further study or employment in the profession of chemistry. Thus, assessors also ensure that time spent in the laboratory is truly beneficial and would not usually include unsupported preparation or write up time within the stipulated hours.

The Committee for Accreditation and Validation recognises that, under the current circumstances, many departments will not be able to run traditional laboratory classes and will need to modify their practical courses to ensure that students still meet the key requirement to develop a range of practical skills.

It may, for example, be necessary to rearrange practical sessions, with extensions to teaching hours or term dates, and intensive practical courses, perhaps even in vacations. In rescheduling practical classes, departments should balance the challenge of running socially distanced laboratory sessions with the risk of delaying all practical work until later in the year, and consider the likelihood of further local or national restrictions. Some students may even be provided with take-home practical kits for simple experiments.

Alternatively, some established experiments may be replaced by videos or simulations to familiarise students with equipment or techniques, or by providing students with data to analyse. Such activities already form a part of many excellent practical courses. The Committee will not, however, expect a direct equivalence in practical hours between

conventional 'wet' experiments and 'dry' lab activities. Departments should aim to maintain the time spent within the laboratory where ever possible, although the Committee recognises that in many cases, a reduction in the number of hours spent in the laboratory is unavoidable. Rather, assessors will use their judgement to ensure that students are still exposed to a wide and balanced range of techniques.

In developing plans for practical teaching of undergraduate programmes, departments may choose to prioritise particular cohorts of students, acknowledging that requirements for accreditation need to be met across the entire programme rather than necessarily within a particular year of study. For undergraduate programmes, departments should pay particular attention to the needs of both first-year undergraduate students, many of whom will have been out of formal education for some time, and of final-year students who will not get a further opportunity to make up for any time that is missed in the laboratory. Even so, it should be recognised that practical work is an integral and essential part of a chemistry degree and all students should experience some form of meaningful practical work within the year, typically equivalent to no less than half of the time that they would originally have been expected to spend in a laboratory. Providing the practical experience in other years of study is not compromised, this should result in a reduction of no more than a quarter in the total time that students spend in the laboratory across their entire programme.

For discrete masters programmes, departments should ensure that students will realistically be able to achieve the intended learning outcomes for the practical aspects of the programme within the normal period of study.

In all cases, the Committee will seek assurances that students can achieve the intended learning outcomes for the practical element of the programme, and so meet the expectations for the development of practical skills as set out in the QAA Subject Benchmark Statement. The Committee will also expect a commitment to return to a full practical experience that meets the usual requirements for time spent in practical work, as soon as possible.

Should national restrictions affect practical studies in subsequent years, then the Committee will issue further guidance on how to maintain the standards necessary for accreditation.

Project Work

The Committee also recognises that projects for final-year undergraduate students, and for students on discrete masters programmes, may also be affected. Alternative forms of project will be acceptable for accreditation providing that they still meet the intended learning outcomes for the programme.

Bachelors students should still engage in open-ended independent investigative work. For the purposes of accreditation, this need not necessarily be in a conventional research environment, but could be a dissertation or literature review. Departments should, however, try to honour their commitments to students who might have been expecting to work in a conventional research laboratory.

Students on both integrated masters and discrete masters programmes should engage in meaningful research training. Once again, this need not necessarily be in the form of a conventional practical research project. However, the expectations at masters level should be greater than for at bachelors level, with students not only expected to analyse the work of others, but also given the opportunity to develop and test their own hypotheses. A dissertation or literature review alone cannot therefore replace a conventional masters project.

Placements

Industrial and study abroad placements may be disrupted by local, national or international restrictions. Departments should continue to support students on such programmes, to undertake a meaningful placement, even if that has to be shortened, or the scope changed. Where it is not possible to complete a placement, even with a change in focus, then the title of the award should not refer to the placement.

Assessment

The Committee recognises that many of the assessment methods normally used, including in particular, conventional invigilated examinations, will not be feasible in the 2020/21 academic year and that significant changes to assessment methods will therefore be necessary. In revising their assessment, departments should continue to ensure that their assessment is varied and appropriate and tests the intended learning outcomes for the module. Assessment should be rigorous so that academic standards are maintained. Departments should ensure that their revised assessment methods are inclusive and accessible, and supportive of student wellbeing. Students should be aware of, and prepared for, different assessment methods.

Acceptable changes could include replacing conventional examinations with coursework or open-note remote timed assessments. Such changes would be most appropriate for assessments that test students' ability to apply their knowledge to analyse and solve problems, and so demonstrate their understanding, but would not be considered as acceptable alternatives for assessing factual recall.

When replacing conventional invigilated examinations, departments should ensure that the work is the student's own, either through the design of the assessment or by putting in place appropriate mechanisms. For example, departments should consider carefully the duration of timed assessments, recognising that shorter, timed assessments can reduce the opportunities for collusion and cheating, but that students will need extra time to scan in and upload handwritten answers.

Frequently asked questions

Is it acceptable to replace some conventional experiments by online resources such as simulations or video clips?

Yes. Online resources can be a very effective way of introducing students to particular practical techniques and equipment and instrumentation. Where it is not possible for students to get hands-on experience themselves in a practical laboratory, departments should use simulations and video clips to ensure that students are still exposed to a wide range of practical techniques.

Will students still be expected to spend the same amount of time in the laboratory?

No. Although we want to ensure that students get the best possible experience of practical chemistry, we recognise that in many cases, it will not be possible for students to spend the same amount of time in the laboratory.

Will you accept a reduction in the number of hours students spend in the laboratory?

Yes, with conditions. The criteria for accreditation currently require students on bachelors programmes to spend at least 300 hours, and students on integrated masters programmes, 400 hours, in the practical laboratory across the entirety of a programme. However, we understand that if some experiments are replaced by alternative activities, students will, this year, spend less time in the laboratory. Providing that the intended learning outcomes for the

practical elements of the degree programme are met, and students are still exposed to a wide range of practical chemistry, then we will maintain accreditation, even though there may be a temporary reduction that takes the time spent in the laboratory below these thresholds.

All students should, however, continue to get some experience of working in a practical laboratory in the academic year. Typically, this should be at least half of the time originally envisaged for the year. Wherever possible, departments should try to make up for any loss of time spent in the laboratory in subsequent years, but we accept that, even so, some students will not necessarily spend the requisite hours in the laboratory.

Do we need to make up for any lost time in the practical laboratory with other activities?

Yes. Where time in the laboratory has had to be limited, we shall expect departments to provide alternative activities, such as simulations, virtual experiments or video resources to ensure that students can still experience a wide and varied practical experience. The emphasis should be on the skills developed and techniques covered, rather than a one-to-one equivalence of time.

Is it acceptable for a research project to be replaced only by a literature review for a student on an integrated or discrete masters programme?

No. The accreditation criteria require integrated and discrete masters students to gain an experience of research training. This must include all aspects of research, including not only reviewing and analysing the work of others, but also proposing, developing and testing new hypotheses. It need not necessarily include data collection itself, providing that students have already gained sufficient experience through their other practical work, so it would be acceptable for students to draw on the work of others, but they must be able to build on the work already done.

Will we be required to offer the same range of research projects for students on integrated or discrete masters programmes?

No. We understand that some particular research projects may be difficult or impossible to run. We would hope that departments would try their best to accommodate the interests of students so that, for example, students who might wish to pursue research careers in synthetic chemistry get the chance to have a meaningful experience of working on a synthetic research project. However, we appreciate that some compromise will be necessary.

Is it acceptable to replace conventional closed-note invigilated examinations by remote open-book assessments?

Yes, especially where assessments are intended to test students' understanding through solving or analysing problems, rather than factual knowledge. Nevertheless, in designing alternative assessments, departments should ensure that academic standards are maintained and put in place mechanisms to ensure that the work is the student's own.

Is it acceptable to continue to offer timed assessments?

Yes. Experience shows that timed assessments, where students have a period of a few hours, as opposed to a day or days to answer questions, can be very effective. Such assessments can help in minimising student anxiety, and workload, especially where there might be a temptation for students to spend all of the time available, rather than just the time

necessary, in perfecting their answers. They also help in reducing the opportunities for collusion, and so protect the rigour and hence the value of the degree.

Can the length of an assessment be extended if it is changed from a conventional closed-note invigilated examination to a remote open-book assessment?

Yes. Assessments should continue to be inclusive by design. Students are likely to need extra time to compensate for distractions and to allow them to scan and upload handwritten answers. However, in determining an increased length for an assessment, departments should consider both the increased risk of collusion or cheating, and the impact on student wellbeing.

Can students be set the same assessment at different times?

Yes. Assessments should be inclusive and the timing should not disadvantage students in different time zones. However, where students take the same assessment at different times, departments must mitigate against the increased risk of collusion and cheating, either through the design of the assessment itself, or by putting in place mechanisms to identify dishonesty.

Can we offer longer, more open-ended assessments to replace conventional examinations?

Yes. We encourage innovation in assessment, and want to support departments in finding the most appropriate form of assessment, especially in the current challenging circumstances. This can be an opportunity to set more challenging open-ended assignments that better test students' problem solving and analytical skills. Where the form of assessment changes significantly, students should be given sufficient practice.

We would advise against setting conventional examinations which would normally take, for example, 2 hours, but allowing students longer periods, such as 24 or 48 hours to complete. Experience shows that some students become complacent, believing that there is no need to revise and that they can just copy answers from their notes, so that the formative value of the assessment is lost. Equally, other students will spend all of the time available, even if that means spending many hours continuously working, in order to ensure that they get the best possible mark.

Where you intend to offer students longer periods to complete examinations, then we will seek assurances that you have considered the implications for student development and well being and can ensure that the rigour of the outcomes will not be compromised. If you would prefer to allow students an extended period for completion, then it may be better to modify the form of assessment completely.

Should remote examinations be invigilated?

No. Provided that you have designed the form of the assessment to minimise the opportunities for collusion and have mechanisms in place to catch any cheating, there should not be any need for invigilation or remote proctoring.

Are computer-marked assessments an acceptable replacement for conventional written examinations?

Yes, under certain circumstances. Online assessments, such as multiple-choice or multiple-completion tests, can be a very effective way of assessing, especially in the earlier years of a programme where there may be a closed set of well defined answers. They can also be very efficient for departments, although it should be remembered that writing good questions, with an appropriate set of distractors, is not necessarily straightforward and the

time spent in constructing such assessments can sometimes be greater than the time gained by automatic marking. Where such an assessment is well constructed and appropriate for both the material and the level, and where appropriate mechanisms are in place to ensure that students cannot collude, computer-marked assessments will be deemed acceptable.