

# **Society for Natural Sciences Degree Accreditation Handbook**

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## **1. What we accredit**

We will accredit bachelors, or integrated master's undergraduate degrees with 'Natural Sciences' in the title. By default, we will look to accredit whole programmes. However, where there are concerns about a programme's ability to meet the requirements, we will allow for differentiation between programme streams.

## **2. Aims of accreditation**

Through this accreditation process we want to drive the development of interdisciplinary science and interdisciplinary science education, giving interdisciplinary scientists a voice through recognising our shared experiences, values and beliefs.

The aim of accreditation is to provide a benchmark against which a Natural Sciences degree can be judged. An accredited degree will ensure that a set of attributes and skills in core science subjects are achieved by students. The accredited degree will be recognised by employers and professional organisations in that it provides and develops theoretical knowledge and practical skills in science subjects, while also enhancing interdisciplinary and transferable skillsets.

This aims to be a supportive process whereby institutions are helped to develop their interdisciplinary pedagogy for the benefit of all staff and students. The accreditation process also aims to identify examples of best practice and facilitate sharing of best practice in the sector.

### **2.1 Benefits for HEIs**

Accreditation, or the process leading up to accreditation, gives an assurance of the quality of interdisciplinary education on Natural Sciences degrees across different institutions. It will allow HEIs to attract high-quality students from diverse backgrounds onto their interdisciplinary degree programmes and will lead to wider recognition of the benefits that Natural Sciences programmes can bring.

### **2.2 Benefits for students and graduates**

Students enrolled on accredited Natural Sciences degree programmes will be assured that they will study science subjects with the same rigour and quality as students on single honours programmes and regardless of where that accredited programme is taught. They are also guaranteed to learn and develop skillsets in practical aspects of the science subjects which they study. This will ultimately enhance their career prospects.

### **2.3 Benefits for employers**

The accreditation of a Natural Sciences degree programme ensures a level of quality, in particular with respect to the knowledge acquired by students, the interdisciplinary ethos of the programme and also certain skillsets expected with those subjects. In addition, ancillary/transferable skillsets, such as data analysis and communications skills, can also be expected in graduates from accredited programmes.

### 3. Structure and Governance

**Accreditation Committee:** The Accreditation Committee is appointed by the Society for Natural Sciences from members of the Society. Membership of the Accreditation Committee is limited to a maximum of two terms (5 years each). The chair shall only serve one five year term. The Committee are responsible for producing the Accreditation Handbook and recommends to the Society the award of Accreditation by the Society.

Committee membership is laid out in appendix 2.

**Accreditation Panel:** Panels are convened by the Accreditation Committee for the purpose of reviewing applications for accreditation and receiving recommendations from the accreditors on the Visit Team for each institution under consideration. All members of the Accreditation Committee are also members of the Accreditation Panel, which also includes the Chief External Assessor and one reporting member from each Visit Team.

**Visit Team:** Teams are delegated by the Accreditation Committee to evaluate applications, carry out accreditation visits and make recommendations to the Panel.

This accreditation framework has been written by the Accreditation Committee which is responsible for the structures and processes laid down here. The Committee is also responsible for appointing assessors to each institution wishing to apply for accreditation. The Committee membership is listed above. The Accreditation Committee chair shall not take part in the accreditation of individual institutions and will chair the Accreditation Panel meetings.

The Accreditation Committee shall appoint a chief external assessor (maximum term 5 years) who, along with the Accreditation Committee chair, will oversee the Accreditation Panel and ensure the process and resulting decisions are rigorous, robust and defensible. The chief external assessor should be someone not involved in the delivery of Natural Sciences at any institution and shall have considerable experience of quality assurance and/or accreditation processes with other bodies.

The Accreditation Committee shall recruit a pool of accreditation assessors from both within the Society and outside the Society. Assessors should have experience of quality assurance and/or accreditation processes, either within their own institution or beyond e.g. involvement in periodic subject review beyond their own discipline. Assessors will be asked to review the submission from an institution, attend the accreditation meeting and submit a short written report as part of a Visit Team.

Rates of pay for the chief external assessor and accreditation assessors are laid out in appendix 1.

The Accreditation Committee shall appoint a Visit Team of three assessors to each institution applying for accreditation. This will normally be two Society members and one external assessor but will always include at least one external and one Society assessor and shall not include any individuals from, or current external examiners of, the institution under consideration. Conflicts of interest must be declared on appointment to a team.

The Visit Team will review the submitted documentation and carry out the accreditation visit with the institution under consideration. The Visit Team will make a recommendation to the Accreditation Panel and submit a short report. One member of the team will be expected to attend and present a summary of the decision and influencing factors at the panel.

An Accreditation Panel will meet to consider all applications in a given period. The panel will be chaired by the chair of the Accreditation Committee and the chief external assessor and Accreditation Committee members will be in attendance, as well as an assessor responsible for reporting from each institution seeking accreditation. Visit Teams will make recommendations to the committee for ratification.

### **3.6 Accreditors code of conduct and declarations of interests**

The members of the Accreditation Panel must abide by the Society's code of conduct and must declare, prior to the start of the accreditation process, any potential conflicts of interest. Where a programme(s) from a panel member's own HEI is under consideration, that panel member must absent themselves for the duration of the discussion around that programme(s).

## 4. What does accreditation involve?

*We have referred to a 'visit' throughout this document but all visits in 2021 will be virtual.*

### 4.1 Process

#### Step 1

HEIs should submit the 'Intention to apply for accreditation' form, initiating a discussion with the Accreditation Committee about what is required, readiness and timelines.

At this stage the Accreditation Committee may consider that a programme is not appropriate for accreditation and will advise the HEI as such.

#### Step 2

HEIs should submit a 'case for accreditation' accompanied by supporting evidence, as specified in the case for accreditation form. This must be submitted four weeks prior to the planned visit, as agreed with the Visit Team. This is not intended to be onerous or unduly bureaucratic and is designed to complement other accreditation processes which may have been undertaken with other professional bodies so as to minimise the duplication of paperwork.

A Visit Team will be nominated by the committee, and the visit team will carry out the visit in step 3. This 'case for accreditation' will be assessed by at least two members of the Visit Team. They will provide brief written feedback outlining any additional evidence that should be provided at least 48 hours prior to the visit.

#### Step 3

Three Visit Team members will conduct a visit with the HEI to speak to the programme team and current students. The purpose of this is to allow the Visit Team to understand how the programme is run, find out about the student's learning experiences, and ask question/clarify any points raised in the paper evidence submitted. It is intended that the discussion will minimise the onerous task of assembling quantities of documentary evidence.

#### Step 4

The Accreditation Panel (see 3.5) meets to consider all applications during the period under review. One of the assessors from each institutional visit will be present and will make a recommendation to the panel that,

1. The programme(s) should be accredited
2. The programme(s) is not yet ready for full accreditation but can be granted interim accreditation. Interim accreditation may be granted to programmes which have not yet graduated any students, or programmes which require minor amendments before accreditation can be granted.

a) where interim accreditation is granted because a programme has not yet graduated any students the institution will be invited to submit a paper-only summary of matters relating to graduating student within 12 months of the first cohort graduating.

b) where interim accreditation is granted due to the need for minor amendments, this may consist of conditions for accreditation and recommendations for improvement. Institutions will be asked to resubmit relevant paperwork within 3 weeks, demonstrating that they now can meet those conditions for accreditation, and which will be assessed by the chair of the Accreditation Panel within one week of receipt.

3. The programme (s) should not be accredited. Programmes will be given detailed feedback and invited to resubmit after 12 months. As long as resubmission is within 18 months of the initial decision no additional fee will be charged. If more than 18 month elapses any resubmission shall be considered a new application and shall incur the full fee.

Initial feedback will be provided to the institution within two weeks of the visit but a final decision will not be made until the meeting of the Accreditation Panel, the date of which will be publicised in advance.

The accreditation panel should reach consensus on the decision. Where consensus cannot be reached the chair of the panel and chief external assessor will rule on the final outcome.

Universities will be given a summary judgement of the outcome of the Accreditation Panel within 48 hours. A full report and feedback will be returned within four weeks.

Accreditation will normally be for a period of 5 years subject to there being no major revisions to the programme structure. HEIs undertaking significant revisions to programmes, such as those affecting core modules, should engage with the Society Accreditation Committee at the earliest opportunity in order to discuss the impact such revisions may have on their programme accreditations.

#### **4.2 Costs**

All costs are outlined in appendix 1.

#### **4.3 Guidance for publicity around accreditation**

In any round of accreditation there will be an embargo on all publicity until all those institutions initially submitting an 'Intention to apply for accreditation' form have been adjudicated on. The accreditation panel date will be published in advance.

#### **4.4 Removal of accreditation**

The Society may consider withdrawal of accreditation from a previously accredited programme if the HEI fails to continue to pay the costs of accreditation or if changes are made to the programme structure that materially affect the delivery of the programme and the programme's ability to meet learning objectives and/or the accreditation criteria laid down by the Society.

#### **4.5 Typical accreditation visit agenda**

This is an outline agenda; the precise details can be arranged with the HEI and Visit Team prior to the visit.

- |             |   |
|-------------|---|
| 9.30-10.00  | Pre-meeting of the assessment panel to review preliminary discussion around the paper submission and clarify the primary objectives of the meeting. |
| 10.00-11.30 | Presentation from and Q&A session with the programme team   |
| 11.30-12.30 | Meeting with students and recent graduates  |
| 12.30-13.30 | Working lunch meeting of the assessment panel and discuss additional material provided prior to the visit   |
| 13.30-15.00 | Opportunity to discuss with programme team any issues raised by students or other staff   |
| 15.00-16.30 | Meeting of assessment panel to assemble preliminary feedback.   |
| 16.30-16.45 | Feedback meeting - outlining of next steps.   |

#### **4.6 Reaccreditation process**

Accreditation, in the first instance, is for a period of 5 years. Details of the reaccreditation process will be published by the end of 2024 at the latest.

#### **4.7 Appeals**

Appeals may be sought against failure of due process only, not against academic judgement. and that no appeal against academic judgment will be entertained.

When the Accreditation Panel decides that accreditation will not be granted, or shall be withdrawn the following appeals mechanism is available to the institution.

##### *First Level of Appeal*

Normally, accreditation will be withheld from a degree only after an accreditation visit to the applying department has been conducted. The decision will be communicated by letter which will outline the reasons leading to that decision and give detailed feedback, in particular outlining issues which must be addressed before the application can proceed any further. This First Level of Appeal should be used by the applying department to bring any further information before the Accreditation Committee and to clarify any issues of concern or doubt arising from the original application. The intention to appeal should be communicated to the Society within six weeks from the date of the result letter. The institution will then be invited to supply the Accreditation Committee with a written representation explaining the reasons for the appeal and supporting evidence.



Should the Accreditation Committee fail to be satisfied that the requirements for accreditation have been met a second level appeal is also available to the institution.

#### *Second Level of Appeal*

This will involve a meeting between representatives of the applying institution and an Appeals Panel to comprise of at least the following:

- One member of the core Society leadership team e.g. the chair of one of the other Society committees
- One accreditation assessor not present at the Accreditation Panel and not a member of the original visit team
- One of the Society Trustees
- None of these individuals should be current external examiners of the institution presenting the appeal.

This Second Level of Appeal should be used by the applying institution to clarify any issues of concern or doubt arising from the written appeal. The decision of this Appeals Panel is final and no further appeal is allowed.

## **5. Equality, Diversity and Inclusion**

The Society for Natural Sciences expects that all accredited programmes will be designed, delivered, managed and developed in ways that can clearly demonstrate commitment to principles of ED&I. This will ensure supportive learning environments, inclusive and diverse learning and teaching activities and it will foster opportunities to widen participation through outreach and recruitment activity.

Programme teams will be able to demonstrate engagement with their institutional ED&I policy and show how the programmes embed the associated principles and aspirations.

Programme teams will be expected to undertake a light-touch data exploration, to identify areas of concern and future action which will form the basis of an ED&I action plan and which will be discussed at the accreditation visit. This will include consideration of the recruitment, promotional/outreach activity, academic environment and academic achievement. Reaccreditation will involve review of progress against action plans.

## **6. Criteria for degree accreditation, detailed guidance.**

Natural Sciences is founded on the principles of interdisciplinarity but with a strong grounding in the pure sciences and mathematics. One of the key features of Natural Sciences is the huge breadth of options available to students, and the unique paths taken by many students. As such we appreciate that there can be significant variation in paths between students at an institution. These criteria should be met at a programme level, rather than individual student level.

Bachelors level exit routes from MSci programmes must be able to meet the requirements demonstrated for standard BSc programmes.

### **6.1 Interdisciplinarity**

The ethos of accredited programmes should be one of embedded interdisciplinarity, where the scientific learning and experiences gained by students are greater than the sum of their single discipline components. Institutions are asked to justify why their approach and programme structure enhances their students as interdisciplinary scientists. We do not have a prescriptive list of subjects or their weightings, but rather would like to see institutions demonstrate the added value of interdisciplinarity in their programmes.

There must be a programme level commitment to true interdisciplinarity i.e. a demonstration that the programme has a clear approach to encouraging cross over between the learning in science disciplines rather than students simply studying multiple disciplines in isolation. This could be demonstrated through one or more of the following, or other appropriate measures.

- Bespoke interdisciplinary modules
- Bespoke interdisciplinary project work
- Narrative explanations of the pathway structure and programme design decisions
- Clear buy-in of other departments to the ethos of the programme. E.g. evidenced through departmental representation on Natural Sciences teaching and learning committee or other demonstrable involvement in conversations about programme structure and ethos.

### **6.2 Depth of Knowledge**

In stages 1 and 2 (levels 4 and 5) students should study appropriate core knowledge in their chosen disciplines in order to provide a sound base for advanced specialist knowledge both within disciplines and interdisciplinarity between disciplines. This depth of knowledge should allow students to critically evaluate their own research, and that of others, in later years.

Interdisciplinarity and thus breadth of knowledge should not be seen as a replacement for depth of knowledge.

Core knowledge could be evidenced by being part of degree programmes accredited by other professional bodies within relevant disciplines, or where accredited programmes do not exist, through alignment with appropriate aspects of the QAA benchmark statements for that discipline.

For MSci programmes students should normally take 120 credits (out of a total of 120 credits) at level 7.

### **6.3 Practical Skills**

Students must develop a range of practical skills appropriate for the subject combination studied. These are not limited to those in a laboratory setting and may include skills such as:

- Laboratory skills with appropriate health and safety training
- Field work skills, including the planning of field work and management of risk in the field
- Computational skills e.g. learning and applying programming languages

Practical skills developed during the programme should equip students to plan and undertake investigative science in a safe environment with an understanding of scientific rigour and taking in to account appropriate ethical considerations.

### **6.4 Mathematics Skills**

Students should develop mathematical and data analytical skills appropriate for their subject combination studied. The mathematics should be sufficient to support subject understanding and problem solving. Mathematics skills should also be sufficient to allow students to carry out rigorous data analysis as required in the discipline, in particular to support project work in the final stages of the degree programme.

Programmes should demonstrate that mathematics skills appropriate to that subject or discipline are embedded in core modules for each programme stream, such that no student can avoid mathematics altogether.

### **6.5 Project work**

Whilst it is understood that the types of project undertaken as part of a Natural Science degrees covers a wide range of areas these projects must be enquiry-based and demonstrate independent scholarship. Project work should constitute a substantial part of the final year of both MSci and BSc programmes and should normally be non-condonable.

BSc projects may be undertaken individually, in pairs or in small groups, but MSci projects should normally be undertaken individually. Projects may be theoretical, computational, experimental (in the laboratory or field) or data analytical. For BSc students projects could also take the form of an independent critical literature review.

For BSc programmes the project should normally contribute a minimum of 15% of credits in the final year of the programme.

For MSci programmes the project should normally contribute a minimum of 33% of credits in the final year of the degree programme. Projects must be original, open ended, enquiry led irrespective of the overall nature of the project e.g. hypothesis driven or discovery science, as appropriate within the field of study. Projects should also involve consideration of the ethical aspects of the work.

Project work, including literature reviews, should be open-ended in nature and allow students to develop ideas and originality with a view to being potentially publishable, either stand-alone or more commonly as a contribution to a larger piece of work by the supervisor/research group in which the project is embedded.

Programmes must provide appropriate research training to equip students with the necessary skills to complete projects in their chosen area.

## **6.6 Professional Skills**

Students on accredited programmes must develop a range of key transferable skills which should form a demonstrable part of all programme streams.

- Basic IT skills: students should develop their IT skills across a variety of areas including document production, the analysis, manipulation and presentation of data, information searches and, where appropriate data analysis and programming.
- Ability to find, use and cite information appropriately: students should understand where and how to find accurate and reputable sources of information, and how to use and cite these in their work.
- Problem solving and data analytical skills: students should be able to tackle both problems with well-defined solutions and open-ended problems. They should develop skills to tackle unseen problems with confidence and be able to use different strategies to tackle interdisciplinary problems from different angles.
- Ability to demonstrate independent critical thinking and insight: students should have the opportunity to develop independent critical thinking and creativity. Students should be encouraged to have confidence in their own creativity and insight.
- Communication both orally and in writing to a range of audiences: students should develop communication skills across multiple formats. They should have the opportunity to communicate their science via different media at all stages of their degree programme e.g. use of technical language, posters, presentations, written documents, more informal methods of communication such as social media.
- Team work and leadership skills: students should develop the ability to work effectively independently and as part of a team. All students should have the opportunity to develop leadership skills through group work.
- Project management skills: students should be able to organise themselves and others in their team, where applicable, to manage and meet deadlines.
- Ethical understanding: students should develop an understanding of how to conduct themselves and their science in an ethical manner and the importance of ethical integrity in science.

In addition, students should develop an awareness of:

- Equality, diversity and inclusivity: students should develop an understanding of EDI issues in STEM and understand work going on to address them.

## **6.7 Placements**

External placements (professional or study abroad) must be subject to assessment against criteria with the same rigour as assessments carried out within the home institution, whether credit weighted or pass/fail.

Students going on placements should not be materially advantaged, or disadvantaged, by the assessment criteria on their placement compared to students who choose not to take up a placement.

Industry/professional placements should normally involve a significant work-related assignment. Whilst assessment may be carried out by non-HEI employees in the company in which a placement takes place, the HEI should retain overall control for the supervision and learning experiences of a student on a work-based placement.

Students on a study abroad placement should study courses at a comparable level to those at their home university. HEIs should demonstrate that students studying abroad are appropriately supported during this time by their home institution and that robust processes are in place to convert grades fairly.

HEIs must ensure that students returning from a placement are suitably prepared to recommence study at their home HEI at the appropriate level.

## **6.8 Assessment**

Assessments across the breadth of the programme should be varied, appropriate and rigorous. All students should have the opportunity to undertake a range of different assessment types, demonstrating not only depth and breadth of subject knowledge but also problem solving skills, practical competence (where subject appropriate), appropriate levels of mathematical and data analytical skills, critical analysis, original thinking and a range of communication skills.

Across the range of assessments, marking criteria should be clearly available to students before work is commenced and applied fairly and rigorously throughout the programme.

Progression hurdles within programmes should demonstrate minimum expectations of competence in core areas. Where appropriate these core programme competencies should not be condonable.

HEIs must demonstrate that grading of project work is rigorous, conducted against clear criteria, and that one member of staff/supervisor cannot therefore play an unduly significant role in determining degree outcome.

The final grading of an award should be weighted in favour of student performance in the final stages of the programme allowing students to demonstrate their learning and development over the course of the programme. However final grading should not normally depend solely on the final year.

Condonement of failure should be in accordance with appropriate HEI regulations. Where alternatives are permitted, the rationale for the choice should be provided.

Evidence of appropriate quality assurance at both a module and programme level should be demonstrated.

### **6.9 Degree regulations and quality assurance**

Accreditation criteria should be clearly met in module or programme learning outcomes, or relevant generic or programme specific regulations. All students graduating from the programme should normally have met all of the accreditation criteria.

Institutions are expected to demonstrate that they have clear processes in place to ensure equality of access to their programmes for all students, and process to deal with mitigating or extenuating circumstances.

A clear and robust quality assurance mechanism must be in place for all aspects of the programmes. These processes must ensure that:

- Programmes are adequately supported by learning resources appropriate for the student body
- Individual learning outcomes and core programme specifications are met
- Assessments are carried out at the appropriate standard and that process for assessment and feedback are rigorous and impartial.
- That both the programme structure and assessments allow students access to the full range of marks, allowing students not just to demonstrate that they have met core learning outcomes but also giving students the ability to demonstrate exceptional outcomes.
- That there is a clear process of review and refinement of assessments and programmes.
- That student feedback is sought and acted up on, and that students are seen as partners in their programme design and delivery.

### **6.10 Learning Environment**

The learning environment and associated resources provided to students and staff should enable them to meet the stated learning outcomes in a safe and supported way.

This should include:

- Appropriate health and safety policies to cover the breadth of activity undertaken by the students.
- Appropriate pedagogical and professional development opportunities for staff.
- Appropriate pastoral support for both staff and students to ensure the best possible learning experience.
- Appropriate physical spaces and electronic learning environments for the breadth of activity undertaken by the students.

## **7. Appendix 1 – costs and pay rates**

### **Costs**

The one-off accreditation fee for member institutions of the Society is £700. Institutions are expected to remain members of the Society for the five years of their accreditation. If institutional membership lapses, the Society reserve the right to charge the difference between the non-member fee and the fee plus membership rates paid to date.

The non-member accreditation fee is £2000.

### **Pay rates**

The chief external assessor will be offered an honorarium of up to £500 p.a. to cover review of the documentation and processes, attendance at the annual Accreditation Panel, and submission of an annual written report on the process. The chief external assessor may claim an additional £100 per meeting should additional panels be required in any one year.

Each assessor will be offered an honorarium of £150 per visit and will not be asked to take part in accreditation visits for more than three institutions per year.

## **8. Appendix 2 – committee membership**

Chair – Nicky King (Exeter) *elected April 2019*

Members – Crispin Halsall (Lancaster), Eleanor Crabb (Open), Christopher Brignell (Nottingham), Paul Beales (Leeds), Susan Crennell (Bath) *established April 2019*