

Report of IUA Representatives on the NCCA Biology, Chemistry and Physics Draft Specifications, as presented at the Subject Development Group Meetings in May 2024

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Overview of the IUA's role in Senior Cycle Curriculum Design

For over 75 years, the Leaving Certificate has been accepted by Irish universities for matriculation purposes. This indicates that these universities are satisfied that successful completion of the Leaving Certificate curriculum certifies that a student has reached a standard of education that prepares him/her for university study. To ensure that the standards of Leaving Certificate subjects meet the requirements of the universities, places have been allocated by the NCCA (and in an earlier era by the CEB and the Department of Education) for university representatives to serve on the individual subject development groups (previously referred to as syllabus committees or course committees).

In the past, two representatives from the Irish Universities Association served on each NCCA subject development group. However, in recent years this number has been reduced to one by the NCCA. Given that we are the sole IUA representative on each NCCA subject development group, we are fully cognisant of the great responsibility that this places on our shoulders. In addition, as representatives of the IUA, we fully appreciate the significance of the role of university subject representatives on each NCCA subject development group in ensuring that standards are maintained in our subjects so that the Leaving Certificate syllabus (specification) is an appropriate syllabus for university entrance.

The Leaving Certificate Physics, Chemistry and Biology draft specifications were published in December 2023. In early January 2024, the IUA representatives on the Biology, Chemistry and Physics subject development groups circulated these draft specifications and a detailed online questionnaire to the Heads of Physics, Chemistry and Biological Sciences in all universities represented by the IUA.

In addition to providing us directly with their views on the Draft Specifications through the IUA online questionnaires, we also made our colleagues aware of the opportunity to provide feedback directly to the NCCA via the NCCA website. In all a total of 22 University Schools / Departments and individuals submitted responses to us via the online IUA survey or via written submissions made directly to us.

Arising out of the analysis of data gathered by the three IUA representatives, in January – February 2023, a detailed report (Grenon, Kennedy and McCauley 2024) was submitted to the NCCA by the deadline of 23rd February 2024. In writing this report, we drew on the very valuable feedback from our IUA university colleagues, our teaching experience across the sciences, our knowledge of our own specialist areas, our teacher education experience, our research experience in the areas of science and science education, our involvement with curriculum reform at national and international level and our experience of serving on the NCCA subject development groups.

The work of the development groups for the design phase of the specification development has now concluded. Once published it is intended that the new specifications will be implemented by the Department of Education in schools in September 2025.

Access to Public Consultation data, and the IUA Representatives Report

Three meetings of each of the NCCA Biology, Chemistry and Physics development groups have been held after the deadline of 23 February 2024 set by the NCCA for receipt of submissions passed. Summarised feedback from the public consultation was presented to the development groups by the NCCA, however access to the consultation data in terms of individual or grouped submissions was not permitted. A general summary report containing some of the feedback shared within the groups was circulated to the development group teams, however this was not circulated until the finalisation of the draft specifications and all subject development group meetings were concluded.

The IUA Representatives Report we drafted (Grenon, Kennedy and McCauley 2024) was not shared with the members of the NCCA Biology, Chemistry and Physics Development Groups as part of the three meetings, However, it was available online, publicly through the IUA website, and individual IUA representatives raised the key recommendations emerging from this report at every possible opportunity during meetings.

Progress made on key recommendations in IUA Representatives Report submitted to NCCA in February 2024

In this section we report on the progress made on the seven key recommendations made in the IUA Representatives Report submitted to the NCCA in February 2024.

Recommendation 1: *in order to bring clarity to all learning outcomes that are unclear, the three draft specifications need to be brought up to standard by the relevant NCCA Subject Development Groups by inserting the appropriate additional information required to bring clarity to all learning outcomes.*

Progress made: Very good progress has been made in bringing clarity to many of the learning outcomes. However, there are still a number of learning outcomes where further clarity is needed – especially in those using the term “model” as a verb in the Physics and Chemistry specifications.

Recommendation 2: *Clear lists of mandatory student investigations should be drawn up for each specification by the relevant NCCA Subject Development groups and embedded into each of the three specifications.*

Progress made: Despite the fact that it is international best practice (e.g. AQA 2024) to include clear lists of student mandatory student practical work (also called “required” practical work), these lists have not been included in the specifications. However, discussion arose in some development groups in relation to the need for this to be included in the teacher guidelines documents. In a survey carried out by ISTA (ISTA 2024), 96% of teachers expressed a wish to have a clear list of mandatory student practical work in the Biology, Physics and Chemistry specifications as exists with the current Leaving Certificate Biology, Chemistry and Physics specifications.

It is essential that the teacher guidelines and the teacher CPD address the practical components as specifically as possible. This is essential for quality course delivery (ISTA consultation report; Reiss et al. 2012, Abrahams and Reiss 2015) as it provides:

1. Clarity for both students and teachers regarding the mandatory list of experiments, whereby all students acquire a requisite set of basic key skills in laboratory practical work.
2. Clarity for teachers and technicians in planning for and carrying out risk assessments and designing safe laboratory practice.
3. Clarity for teachers and school managers in planning for adequate laboratory funding (also in supporting lab management/stocktaking).
4. Clarity for school managers in arguing for sufficient funds from the Department of Education to offer a 'level playing pitch' between schools for minimum funding.

Recommendation 3: *The Department of Education, the NCCA and SEC should publish the full range of syllabus documentation concurrently and not less than 12 months prior to implementation of any new syllabus. The syllabus documentation should include a detailed syllabus which embeds depth of treatment and comprehensive teacher guidelines into the syllabus, sample examination papers and sample marking schemes. New specifications and CPD programmes should not be implemented without all of these materials being available.*

In the IUA submission made to NCCA (p. 21) it was stated that we supported our ASTI and TUI colleagues in the motion passed at their Annual Conference in 2023:

That the ASTI / TUI demand that, for all future Leaving Certificate syllabi (specifications), the Department of Education, the NCCA and SEC publish the full range of syllabus documentation concurrently and not less than 12 months prior to implementation of the syllabus. The syllabus documentation to include: a detailed syllabus which embeds depth of treatment and comprehensive teacher guidelines into the syllabus, sample examination papers, sample marking schemes, rationale and research-based evidence that underpin the changes to / for introduction of syllabi

Progress made: At the time of writing (May 2024), suggested timelines for the publication of curricular support materials has been given to some of the development groups. Although further clarity is needed for each of the groups, there appears to be a positive intention to produce supporting materials in a timely manner. Groups were informed that sample examination papers will be made available in April 2025.

Recommendation 4: *When the detail described in recommendation 1 above is written into the draft specifications, an audit should be carried out by the NCCA Subject Development Groups to calculate the time needed to implement each learning outcome in the classroom to ensure that the total time is within the 160 hours of class contact time.*

Progress made: In some subject development groups, individual teachers on these groups submitted data on the estimated teaching time for the new specification. However, none of the details have been published or shared by the NCCA with members of subject development groups. The development groups were informed that a time audit could take place as part of the 'Early Enactment' process. Early Enactment is the term given to the first roll out of the specification. Following one complete iteration (2-year cycle) of the specification, a time audit assessment will be carried out.

Recommendation 5: *Discussions need to be held at NCCA Subject Development Groups to ensure the correct balance between Higher Level and Ordinary Level learning outcomes in all three specifications. Collaboration between the three groups should be initiated to assist in some level of consistency across the three specifications.*

Progress made: Some discussions have been held within individual subject development groups suggesting that this balance should be satisfactory but, as IUA representatives, we are concerned that insufficient time has been devoted to this discussion and ensuring that there is the correct balance between Higher Level and Ordinary Level subject matter. No collaboration between the Biology, Chemistry and Physics subject development groups has taken place regarding rationalising this balance, as opposed to unifying approaches used to discuss other part of the specifications.

Recommendation 6: *A clear method of linking each learning outcomes to information given in the SLA column should be devised to bring clarity to learning outcomes.*

Progress made: A lot of work has been carried out around this in the last three meetings and very good progress has been made in this area with further clarification and detail across each of the strands. In some cases, scientific accuracy of the content was also checked by members of the committee or scientific experts. It was felt by IUA representatives that additional time spent on this might have improved the clarity further. Comments were made that the visual formatting of these tables would greatly improve the clarity.

Recommendation 7: *Given the feedback from our IUA colleagues and our experience in initial teacher education and university teaching, we cannot see how the proposed Additional Assessment Component model is feasible without huge investment in our school science laboratories and the employment of laboratory technicians. Therefore, we recommend that an alternative model be developed to give students credit for carrying out laboratory practical work investigations and that the 40% of marks be reduced to 20%.*

Progress made: The development groups were informed by the NCCA that discussion around the % allocation and school resource/support implications did not fall within the remit of these working groups. However, the NCCA agreed to make a recommendation, highlighting these concerns to the Department of Education. Concerns highlighted by IUA colleagues and reflected in the IUA Representatives Report include:

- The high allocation of 40% of marks.
- Resource implications for laboratory equipment / supplies.
- Additional stress on students and teachers.
- Adverse uptake on science subjects at Leaving Certificate level.
- Problems with access to school laboratories.
- Widening of the social divide.
- The role of A.I. in completing coursework.
- Health and Safety implications.
- Increased workload on science teachers.
- Profession of science teaching becoming less attractive.
- Lack of lab technician support.

Without clarification from the Department of Education on how these significant concerns will be resolved, especially regarding resource implications and more details on how the system will operate at school laboratory level, we recommend that the course work element of the specifications is reduced to 20% (Grenon, Kennedy and McCauley 2024).

Conclusions and Recommendations

As noted above, overall, very good progress has been made with the draft specification, and we thank our colleagues on the subject development groups and the NCCA for their collaboration during this process.

However, in relation to the implementation of the specifications, which we are aware falls beyond the remit of the NCCA's subject development groups, adequate financial supports (on the grounds of health and safety, and parity across the social divide) must be provided to all teachers and schools [Recommendation 7] and adequate teaching supports must be developed and shared in a timely fashion with teachers [Recommendation 2 and 3]. Without these assurances, as IUA Representatives, we cannot add our support to the implementation of these draft specifications.

Therefore, we advise the Department of Education that we wish to dissociate ourselves from the implementation of specifications in Biology, Chemistry and Physics that allocate 40% to a research investigation, without further clarification regarding resources and measures to prevent widening the social divide between secondary schools in Ireland.

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