NCCA
An Chomhairle Náisiúnta Curaclaim agus Measúnachta
National Council for Curriculum and Assessment

Report on the consultation on the draft Leaving Certificate Engineering specification

June 2025

Contents

Introduction

The Senior Cycle Review: Advisory Report (NCCA 2022) was published in March 2022 following the response from the Minister for Education, Norma Foley, TD. Actions outlined in the Advisory Report include a review of existing curriculum components - subjects, modules, and programmes. In March 2022, the Minister for Education requested that NCCA undertake a series of actions to support the realisation of her vision for a redeveloped senior cycle as set out in Equity and Excellence for All (Department of Education, 2022.) One key action set out in this plan was that a schedule of senior cycle subjects and modules for redevelopment be prepared for approval by the Minister.

NCCA subsequently prepared a schedule of subjects for review, which was organised into a number of tranches. The redevelopment of Tranche 2 subjects will be completed in 2025 for introduction to schools in 2026. The redevelopment of the specification for Leaving Certificate Engineering is included in Tranche 2.

The draft Leaving Certificate Engineering specification was made available for public consultation from March 3 until May 2 2025. The aim of the consultation was to elicit a wide range of perspectives from the public and a wide range of stakeholders in relation to the curriculum and assessment arrangements in the draft specification for Leaving Certificate Engineering. The feedback from the consultation supports the development group to finalise the specification.

The key areas of focus within the consultation were:

- Rationale and Aims
- Key competencies
- Course structure, strands and learning outcomes
- Additional assessment component
- Supports needed for successful enactment.

While respondents welcomed its focus, ambition, modernising intent, and relevance to industry, some concerns were raised regarding the assessment arrangement which is different to what has been in practice for the last four decades.

The Rationale and Aims, and examples of how senior cycle key competencies can be developed through Leaving Certificate Engineering, particularly its focus on fostering problem-solving, creativity, and critical thinking were affirmed and well received by most respondents. Some respondents expressed concerns around curriculum overload, clarity of learning outcomes, and the need for further guidance and resources to support effective implementation.

There was a strong endorsement of the approach taken regarding the integrated nature and structure of the four strands of study, which were viewed as relevant and well organised.

As noted above, there was a mixed response to the assessment of Engineering. While there was a strong level of approval for the Design and Manufacture Project with a 50% weighting of the

overall marks, there was a cohort of respondents who advocated for a second additional assessment component along the lines of the Practical Day Examination that students undertake who are studying the current syllabus. The overwhelming majority of students and teachers through the school visits welcomed the Design and Manufacture Project. Its 50% weighting was viewed as an appropriate reward for the student's demonstration of skills associated with Design, Manufacture, Computer-Aided Design (CAD), Computer Numerical Control (CNC), Automation and Control.

The following sections of this report will elaborate in more detail on aspects of these general findings. Section One provides an overview of the consultation process. Section Two provides insights into the consultation findings while Section Three presents key considerations and conclusions.

Section 1: Consultation Process

Consultation is a key aspect of NCCA's work, where advice is shaped by feedback from the public, schools, settings, education interests and others. The following section presents an overview of the approach employed during this consultation which is underpinned by the principles set out in NCCA's Research Strategy (2023a) and provides a summary of engagement during the consultation.

Approach to consultation

The consultation for the review of Engineering included multiple modes of engagement during the eight-week consultation process:

- An online survey
- Written submissions
- A public consultation event
- School visits with focus groups conducted in a cross section of schools to capture the insights from teachers, students and school leaders.

Participants self-selected to respond to the online survey, make a written submission and attend the public consultation event. In terms of the school-based focus groups, a cross-section of schools was selected from the 27 schools that expressed an interest in becoming involved in Leaving Certificate Engineering developments. The eight schools were selected using criteria relating to DEIS status, gender, school size and type. Visits to these schools took place between April 2 and April 11 2025 and involved focus group meetings with students and teachers of Leaving Certificate Engineering and with school leaders, as detailed in Table 1. Students aged 18 years and over consented to their participation in the focus groups, while parental consent and student assent was sought for school visit participants under the age of 18. A written record of all discussions was made during focus groups and school visits. The privacy of all contributors to the consultation has been maintained through anonymisation, except where an organisation or individual has given explicit permission to be identified as contributing to the consultation. All data from the consultation has been stored as digital files in line with NCCA's Data Protection Policy (2023b). In accordance with the Open Data and Public Service Information Directive (2021) any data from this consultation will be anonymised and aggregated and made available alongside the report on the website www.ncca.ie.

The online survey was provided in both English and Irish allowing each participant to select their preferred language and was distributed through Microsoft Forms on the ncca.ie website. The survey was framed around the key areas of focus outlined in the introduction.

The public consultation event and the school visits concentrated on the same areas of focus as the online survey and provided opportunities to further explore and probe those areas through conversation. The school-based focus groups helped to gain deeper insights on the draft specification from students and teachers and to gain insights into the perspectives of school leaders.

The written submissions were guided by the same areas of focus as the online survey, school visits and focus groups, and allowed for the exploration of areas of particular of interest to organisations and interested parties.

Consultation responses

Responses were collected across the various modes of engagement which provided multiple opportunities for public engagement. Table 1 below provides an overview of levels of engagement across the consultation.

Mode of consultation	Overview of participants	Numbers
Online survey	Contributors in cl • Teachers • Teacher ed u • Second-le e • PME stude n • Higher/fu th r education students • Parents/gu ardians • Principals/ deputy principals • Industry representa tives • A Teachta Dála • Engineerin g Technolog y Teachers' Associatio n (ETTA)	159* * Of the 47 student responses, 30 have been classified as petition due o the identical nature of the submissions. Of the remaining 112 submissio s, there was also a high leve of repetition that would suggest as being likely petition responses.
School visits with focus groups	Student focus groups Teacher focus groups School leader focus groups	48 17 12
Written submissions	Contributors including: • Teachers' Union • Subject Association • Statutory/Public bodies	34** **Of the 34 submissions, 27 were identical in terms of wording and formatting a nd as such are being treated as

Public consultation event	Attendees includ • Teachers • Parents • Further/Higher educators	16

Table 1: Summary of consultation participants

Section 2: Consultation Findings

This section presents an overview of the feedback received during the consultation. The consultation focused on gathering the open and honest views of the public in relation to the curriculum and assessment arrangements in the redeveloped draft specification for Leaving Certificate Engineering and the findings can be grouped under the following headings/themes:

- Overall impressions of the draft specification
- Clarity and manageability of the learning set out within the draft specification
- Assessment/ Additional Assessment Component (AAC)
- Supports for successful enactment.

The information gathered in response to the questions posed throughout the consultation has been used in the commentary on each theme in this section.

Other areas which were not directly consulted upon, but which were considered relevant to the development of Leaving Certificate Engineering by those participating in the consultation, are also presented in this section of the report.

Overall impressions of the draft specification

The draft specification for Leaving Certificate Engineering was considered by participants to represent a forward-looking and comprehensive overhaul of the subject, designed to keep pace with evolving advancements in engineering while fostering holistic learning. It was considered to balance theoretical knowledge with practical application, ensuring students gain both the analytical skills and hands-on learning essential for future studies and careers in engineering and related fields.

Respondents praised the specification's focus on integrated and interconnected learning while having an emphasis on applied, real-world problem-solving. In particular, the strands addressing automation and design capability were viewed as timely and responsive to developments in industry, including the shift toward digital manufacturing and mechatronics.

The Design and Manufacture Project was positively received by many respondents, who recognised its strong potential to reflect authentic engineering practice. Students regarded the project as a valuable mechanism for promoting student autonomy, creativity, and critical thinking through iterative design and problem-solving processes. Teachers highlighted its effectiveness in drawing together learning from all four strands, while also offering students a meaningful platform to document and present their work in physical forms. The inclusion of an accompanying design portfolio in addition to a physical artefact as part of the Design and Manufacture Project was considered particularly effective in supporting design and reflection, encouraging students to engage deeply with planning, testing, and evaluation. Many respondents acknowledged the project and accompanying portfolio's alignment with real-world engineering practices and praised its capacity to foster transferable skills such as visual communication, project management, time management and applied innovation.

Concerns were raised by some respondents, particularly through the online modes of the consultation, regarding the specification's ability to maintain the subject's traditional practical identity. A recurring theme in these responses was the perceived imbalance between theoretical content and hands-on skill development. Some respondents expressed apprehension that the draft specification risks placing too much emphasis on digital and design-focused learning, while reducing the importance of areas such as bench work and physical manufacturing. The response from the school visits did not support these concerns as they welcomed the increased weighting of 50% for the Design and Manufacture Project as appropriate for the time, effort and demonstration of skills through the design journey record and the make element of the project.

The absence of an assessment component, similar to the Day Practical Examination as it appears in the Engineering syllabus developed in 1983, emerged as a key point of contention mainly through the online modes of engagement during the consultation. It was repeatedly described, in identical submissions and survey responses, as a regressive step that could undermine the rigour of the subject and reduce opportunities for students to demonstrate practical proficiency in a standardised and authentic manner. Some respondents warned that eliminating this component could lessen the subject's appeal for some students and potentially diminish its standing within the senior cycle curriculum. A counter-argument was made in the feedback from the school visits where the management, teachers and students overwhelmingly welcomed the proposed assessment arrangements.

Teachers noted disparities in access to the infrastructure and resources necessary for the introduction of the redeveloped curriculum. Schools with limited workshop facilities, outdated equipment, or inadequate digital infrastructure were seen as being at a particular disadvantage.

Clarity and manageability of the learning set out within the draft specification

The four-strand structure of the draft specification was positively received by many respondents. The approach was described as reflective of contemporary engineering education and industry practice. By presenting engineering as an iterative, interconnected discipline, the structure of the specification was seen to support holistic learning and encourage links across technical knowledge, design, and applied problem-solving.

Some concerns were raised about the scope, specificity, and manageability of the learning outcomes. Some respondents highlighted the number of learning outcomes, the use of aspirational and sometimes ambiguous language, and a lack of clarity around the extent that areas were to be taught. The 180-hour time allocation for Leaving Certificate Engineering was perceived by some as insufficient to meaningfully address the volume and complexity of content in the draft specification.

In Strand 1: Engineering Processes, the emphasis on safe working practices, core manufacturing processes, and technical accuracy was welcomed. Many respondents praised the strong emphasis on precision and hands-on competence, describing it as the heart of Engineering and expressing the need to retain these core practical elements. Some respondents expressed concern about the absence of a structured assessment for these skills, questioning how outcomes related to precision, measurement, and physical manufacture would be reliably assessed.

Some respondents highlighted that the Design and Manufacture Project could provide an appropriate and authentic means of assessing practical competence so long as the expectations around technical accuracy and manufacturing standards were maintained. They noted that, in their experience, project work offers the most authentic original assessment of both theoretical knowledge and practical ability. There was broad agreement that clearer guidance and supports, such as examples of best practice and differentiated assessment approaches, would ensure consistency across schools.

Strand 2: Automation and Control Systems received praise from some respondents for its relevance to modern engineering practice and its forward-looking approach. The inclusion of programmable systems, digital control, and a focus on energy efficiency was seen as a positive and aligning with the direction of advanced manufacturing, robotics, and mechatronics. Some respondents appreciated that the strand aims to prepare students for future careers by exposing them to contemporary technologies such as local, remote, and autonomous control systems. The integration of sustainability concepts such as energy use and renewable energy sources was also viewed positively and seen to reinforce ethical and environmental awareness. Respondents welcomed this strand for offering opportunities to develop key competencies such as *Thinking and solving problem*s, as well as digital literacy skills.

Some respondents raised concerns about the complexity and scope of the strand. Some teachers noted that much of the content, particularly references to Artificial Intelligence, Human Machine Interfaces (HMI), and autonomous systems, may be too advanced for students without prior experience in programming or electronics. In this context, it was suggested that it will require scaffolded supports such as resources and Teacher Professional Learning (TPL). There were calls for clarification on the extent of learning expected of students. Respondents also highlighted the need for significant TPL and investment in equipment to ensure equitable implementation across schools.

Strand 3: Design Capability was viewed as one of the most accessible and engaging strands. Respondents praised its focus on creativity, iterative thinking, problem-solving, and the integration of practical and theoretical learning. Strand 3 was viewed by respondents to support a broad range of learner strengths. Some respondents called for greater clarity on Computer Aided Design (CAD) expectations, clearer requirements around sketching and engineering drawing standards, and differentiation for students with varying levels of prior experience. There was some concern that the strand may overemphasise design at the expense of manufacture. There were also suggestions from some respondents to include specific supports, such as page limits for the design folio, inclusion of key design principles and formulae, and explicit recognition of universal design and sustainability.

Strand 4: Engineering Principles and Energy was recognised by many respondents as a vital and rigorous section of the specification, providing students with a strong theoretical foundation in core engineering concepts. Its inclusion of topics such as force calculations, energy systems, fluid mechanics, and thermal effects was seen as essential for developing analytical thinking, problem-solving skills, and a deep understanding of how engineering principles apply to real-world contexts. The strand was praised for aligning well with the Rationale and Aims of the subject, particularly in promoting scientific reasoning, sustainability awareness, and informed decision-making. The consultation found that this strand could, with the right support, significantly enrich students' understanding and help bridge the gap between theory and application.

Some respondents expressed concern with regard to accessibility and the level of complexity expected of students. While the inclusion of topics such as force calculations, energy systems, fluid mechanics, and thermal effects as mentioned above was acknowledged as central to a comprehensive Engineering specification, some felt that the volume and depth of mathematical and physics-based content may be overwhelming for students, particularly those without a strong foundation in these areas. Suggestions were made to make the content easier to understand, support learning of difficult concepts and there was a call for the inclusion of relevant formulae in the specification.

Some respondents see the absence of differentiation between Higher and Ordinary levels as a limitation. Teachers in particular expressed uncertainty around how to pitch lessons and plan assessments. There were calls for sample exam papers, sample design briefs and supports to ensure consistency and appropriate challenge across diverse student cohorts. Teachers expressed eager anticipation of assessment guidelines and TPL to prepare them for delivering the proposed specification.

Assessment/ Additional Assessment Component (AAC)

The proposed assessment structure for Leaving Certificate Engineering includes a written examination and one Additional Assessment Component (AAC), the Design and Manufacture Project, each of which has a weighting of 50%.

Where this model generated mixed feedback, the project element was broadly welcomed for its potential to reflect real-world engineering processes. Its emphasis on design iteration, problem-solving, and documentation was seen to support critical thinking and creativity. Teachers also noted that it aligns well with the integrated nature of the strands and allows students to showcase their work in a meaningful and individualised way. The 50% weighting for the Design and Manufacture Project was generally seen as appropriate, though some questioned whether this placed too much pressure on a single assessment item. Respondents called for clarification on how the project and accompanying portfolio would be balanced and marked.

In the draft specification, the perceived absence of a Day Practical Examination was the subject of some concern. Where this was the case, respondents expressed strong reservations about the impact of this decision and argued that relying solely on a coursework-based project could lead to inconsistencies in the standard of work, particularly given variations in student access to support, tools, and guidance during the process. There was also concern amongst these respondents about authentication, integrity, and the potential for over-reliance on teacher support. Respondents who expressed this viewpoint did not comment on the opportunities associated with the proposed additional assessment component; rather, the focus was on the absence of a practical examination.

Supports for successful enactment

Respondents identified several key areas to support the successful implementation of the revised Engineering specification. There was recognition of the need for teacher professional learning (TPL) in particular, for the new areas proposed in the specification. TPL should be targeted at

areas such as automation and programmable control systems, energy systems and calculations, CAD and Computer Aided Manufacture (CAM), and assessment calibration and integration of the AAC. It was emphasised that TPL must be accessible, practical, and responsive based on teachers' current needs and experiences in these areas.

A consistent theme was the disparity in resource levels across schools. The consultation called for the need for an audit of engineering classrooms to establish a baseline of equipment to ensure all schools can deliver the specification as intended. Respondents suggested the need for the publication of a standardised equipment list of machines and equipment such as Computer Numerical Control (CNC) machines, 3D printers, and control boards. Access to software licences for CAD and electronics simulation tools were also highlighted as essential for successful enactment of the new specification.

To support planning and delivery of this new specification, respondents requested resources and supports in the areas of exemplar AAC projects and portfolios, rubrics and assessment criteria with student-friendly language, and annotated learning outcomes and examples of integrated delivery across strands.

Finally, there was a strong call for clearer communication on the subject's progression pathways, including its status for third-level entry and apprenticeships. Teachers and school leaders sought reassurance that the revised subject would retain its relevance across both academic and vocational routes.

Section 3: Considerations and Conclusion

Considerations

Overall, the draft specification for Leaving Certificate Engineering was well received and the consultation fulfilled its objective of initiating discussion and debate on key aspects of the design of the redeveloped subject. The consultation feedback was considered by the development group when finalising the specification for Engineering.

Issues raised for consideration in this context included:

- Rewording of some of the learning outcomes to make them more accessible.
- Consideration of the differentiation between ordinary level and higher level to be outlined in the document.
- Consideration of the need for the introduction of a second additional assessment component in the form of a day practical exam.
- Consideration of appropriate supports for enactment, including efforts to broaden the appeal of the subject.

Conclusion

The consultation process was very informative. The engagement of those who participated in the consultation is acknowledged and NCCA is grateful for the feedback received. Consultation feedback indicates there are very positive views on the draft specification, while acknowledging that provision of professional learning, supports and resources are fundamental to successful implementation. The high level of teacher input to the consultation is gratefully acknowledged and the overall positive response from teachers indicates a sense of optimism about the opportunity to revitalise the subject.

References

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Appendix One: List of Contributors

The following is a list of individuals and/or organisations who responded to the consultation and wished to be listed in this report.

Abtech Precision Ireland Ltd - Aidan Mullane
Acentryx Limited
Alpha Spec Ltd
ASTI - Moira Leydon, Assistant General Secretary, Education and Research
AWP Engineering Ltd
Bikar Metals
Bolger Engineering - Paul Collins
Caragh Precision - Edward Kenny
Dromone Engineering Limited - William Egenton
Engineering Industries Ireland - IBEC
Engineering Technology Teachers Association - ETTA
Flynn Engineering - Jeremiah B. Flynn C Eng. FIEI I.Eng. FIET UK
IDEA (Irish Development Education Association) Formal Education Working Group
Kent Stainless - Michael Holton Kent Stainless
Killala Precision Components Ltd - Noel McHale
Mann Engineering Ltd
N&E Precision - Noel Farrell
National Council for Special Education – NCSE - Jane McGuirk & Patrick Murphy
O'Neill Industrial Ltd
Penn Engineering - Ian Murphy
Precision Tooling Machining Association - PTMA
Reilly Plastics Ltd - Bernard Hoey
Rev 1 Precision Engineering
SCHUNK Ireland
Shannon Precision Engineering
Slaney Precision Ltd
Smithstown Light Engineering - Gerard King
Specialty Cutting Tools Ltd - Derek Whyte
Takumi Precision Engineering - Donal Galligan
Technical Engineering & Tooling Services Ltd. - TEG - Tommy Kelly
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Colman Munnelly
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John James Warren
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Mark O'Dea
Martin Cleary
Matt Feehan
Matthew Leonard
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Mike Lynch
Miriam Bonnici
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Nigel Caden
Nigel O'Callaghan
Oliver Plunkett
Padraig Donovan
Padraig Taheny
Patrick Coffey
Patrick Murphy
Ramzan
Ronan Duffy
Ronan McBrearty
Ronnie Duignan
Ryan Dunleavy
Sam Harkness
Sean Lynch
Sean O Maolain

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