Written submission: Consultation on the draft Leaving Certificate Engineering specification

NCCA is redeveloping Leaving Certificate Engineering. The aim of this consultation is to obtain the open and honest views of all stakeholders: students, teachers, parents, and other interested parties. The feedback gained from the consultation will inform the work of the development group in preparing the final specification.

NCCA would greatly appreciate your feedback on the draft specification which can be found here: Leaving Certificate Engineering

When providing feedback, observations or comments, please reference the specific section and / or relevant learning outcomes.

The closing date for this consultation is 2nd May 2025 at 5pm.

Data protection and open data section

NCCA is committed to protecting your privacy and does not collect any personal information about you through this written submission, other than information that you provide by your own consent. Where a respondent selects 'yes' to the question: *Are you consenting to be listed as a respondent to this consultation*, respondents are consenting to having their name / organisation's name published in the final report as respondents to the consultation.

Where a respondent selects 'yes' to the question: *Are you consenting for your submission to be published*, respondents are consenting to having their submission published on ncca.ie.

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NCCA, as a public body operating under the Open Data and Public Service Information Directive (2021), is required to publish publicly funded research. In accordance with this Directive, any data from this will be anonymised and aggregated and only made available after the final report is published. This is expected to be in June 20254. All open data is made available alongside the report itself on the website www.ncca.ie

NCCA may use the data you provide in the form of quotations. Where this happens, the quote will be anonymised.

Respondent's details

What organisation are you submitting on behalf of?

Dromone Engineering Limited, Oldcastle Co Meath A82YH63

Are you consenting to be listed as a respondent to this consultation?

- **Yes**
- ~~No~~

If yes, please enter the name you wish to have published in the final report.

William Egenton, CEO

Are you consenting to have the submission published on ncca.ie?

- **Yes**
- ~~No~~

Rationale, Aim, and Key Competencies [Pages 2,3 and 5]

Rationale: The rationale (P.2) outlines the nature of Engineering and the role and importance of Engineering in realising the purpose and vision of senior cycle.

Aim: The Aim (P.3) outlines the over-arching purpose of the subject and the relevance and expected impact of the subject on student learning.

In your opinion, do the rationale and aim capture the overarching purpose and nature of Engineering; the importance of the subject in realising the vision of senior cycle and the relevance and expected impact of this subject on student learning. Please provide specific feedback / observations / comments.

The rationale and aims clearly describe the broader societal role of engineering and the goals of this subject. The focus on sustainability, innovation, and problem-solving fits well within a senior cycle education. I particularly appreciate how engineering is positioned as both a practical and intellectual subject, developing transferable skills applicable beyond traditional STEAM fields. An added emphasis on the hands-on skills would be of benefit here. Engineering centres on production of high quality and accurate parts, within a tight timeframe, using machinery and tools. Skills like measurement, inspection and interpretation of working drawings are crucial here.

Key Competencies: Key competencies is an umbrella term which refers to the knowledge, skills, values and dispositions students develop in an integrated way during senior cycle. These competencies are linked and can be combined; can improve students' overall learning; can help students and teachers to make meaningful connections between and across different areas of learning; and are important across the curriculum.

The draft specification sets out examples of how key competencies can be developed in Leaving Certificate Engineering (P.5 – 8)

In your opinion, does this section effectively capture the development of student key competencies in Leaving Certificate Engineering? Please provide specific feedback / observations / comments.

The integration of key competencies such as communication, teamwork, and managing learning and self is commendable. These are vital for life after school and should be embedded across all senior cycle subjects. The examples provided show how these are tied to learning activities and real-world tasks, which is helpful for non-specialists trying to understand the purpose of the subject. I see the potential for the true meaning and effect of Engineering to get lost in these competencies. Engineering prepares students for various careers – apprenticeship

to 3rd level – the recognition and rewarding of technical ability needs to remain at the heart of the subject.

Strands of study and learning outcomes [ADD PAGE NUMBERS]

Course overview: The course overview sets out the knowledge, skills, values and dispositions for students in four strands. The specification emphasises a non-linear, integrated approach to learning across the strands. The details of the strands are described on pages 8 - 22 of the specification.

The details of the cross-cutting themes are described on pages 8 – 9 of the specification.

In your opinion, does the structure illustrate the connected nature of the strands and the development of student knowledge, skills, values and dispositions in an appropriate way? Please provide specific feedback / observations / comments.

The structure into four strands makes logical sense, and the cross-cutting themes help reinforce connections between them. However, for someone not involved in engineering, some of the technical language and industry references are quite dense. Including layperson-friendly summaries or examples could make the subject more accessible to parents or students who are curious but unfamiliar. The lack of a distinction between higher and ordinary level would be a negative here.

Strand 1: Engineering Processes (P.12 – 14)

Please provide your views on the learning set out in this strand with reference to

- clarity for planning for teaching and learning
- alignment with the rationale and aims
- opportunities for the development of key competencies and
- access and challenge for all students.

Please provide specific feedback / observations / comments.

- **Clarity for planning for teaching and learning:**
  The outcomes are broad, which gives flexibility, but without specific examples or guidance, it's hard to know what content is being covered. For consistency across schools, more concrete learning outcomes would help.
- **Alignment with the rationale and aims:**
  This strand connects well with the stated goals of combining practical work with critical thinking and sustainability. It reflects a balance between hands-on experience and understanding processes.

- **Opportunities for the development of key competencies:**
  Students will have excellent opportunities to develop confidence, problem-solve, and work independently. This is likely to be one of the most engaging parts of the course for students who enjoy physical tasks and tangible results. There is a real opportunity here to retain the basics of engineering, the skills. Fostering, and awarding, the skills of measurement, machining, benchwork, interpretation of engineering documents is crucial here. The design and make project allows students to show what they can deliver over an extended period of time, while a specific skills examination would allow them to show they can deliver within a tighter timeframe as well, and allow them to be accurately assessed on the skills that they have been taught and honed over a period of years.

- **Access and challenge for all students:**
  Accessibility will depend heavily on school resources. Some schools may lack up-to-date equipment, which could disadvantage students. Equity of experience should be a central concern.

Strand 2: Automation and Control Systems (P.15-16)

Please provide your views on the learning set out in this strand with reference to

- clarity for planning for teaching and learning
- alignment with the rationale and aims
- opportunities for the development of key competencies and
- access and challenge for all students.

Please provide specific feedback / observations / comments.

- **Clarity for planning for teaching and learning:**
  Concepts like sensors, HMI, and autonomous systems could be intimidating without prior knowledge. A glossary or visual examples in teacher/student support materials would be useful.
- **Alignment with the rationale and aims:**
  This strand feels very modern and forward-looking. It's encouraging to see education aligning with technological trends.
- **Opportunities for the development of key competencies:**
  Strong potential for developing critical thinking, especially through debugging and design iteration. I can see how this strand fosters a mindset useful in many careers. There is also an opportunity to invest in these workshops – invest for the future and with some of the latest equipment to allow students to get a taste for the career.
- **Access and challenge for all students:**
  Students who may not have strong technical backgrounds could find this strand challenging. Supporting materials, as well as further refining learning outcomes, could reduce this gap.

Strand 3: Design Capability (P.17 – 19)

Please provide your views on the learning set out in this strand with reference to

- clarity for planning for teaching and learning
- alignment with the rationale and aims
- opportunities for the development of key competencies and
- access and challenge for all students.

Please provide specific feedback / observations / comments.

- **Clarity for planning for teaching and learning:**
  This strand feels like a creative core of the subject. That said, terms like "tolerances" and "ergonomics" may not be well understood without explanation. More examples and added detail would help clarify expectations and learning outcomes. A distinction between higher and ordinary level would help too.
- **Alignment with the rationale and aims:**
  The combination of creativity with real-world constraints mirrors what students will face in adult life. This will serve as a valuable experience.
- **Opportunities for the development of key competencies:**
  Encourages self-expression, communication, and reflection. This is especially valuable for students who may not see themselves as "techy" or "engineer orientated" but are interested in design or innovation. A note of

caution here – engineering is not just about design and innovation, it is about delivering tangible solutions to real world problems.

- **Access and challenge for all students:**
  Some learning outcomes may be complex for students who struggle with technical drawing or spatial reasoning. But the iterative approach should support diverse learners if scaffolded well.

Strand 4: Engineering Principles and Energy (P.19 – 22)

Please provide your views on the learning set out in this strand with reference to

- clarity for planning for teaching and learning
- alignment with the rationale and aims
- opportunities for the development of key competencies
- access and challenge for all students.

Please provide specific feedback / observations / comments.

- **Clarity for planning for teaching and learning:**
  This strand seems the most challenging, especially for students less confident in Maths and Physics. Teachers will need strong support to teach these principles in a way that's engaging and accessible.
- **Alignment with the rationale and aims:**
  The focus on sustainability and energy is very appropriate. These are global concerns, and it's excellent to see them embedded in the specification.
- **Opportunities for the development of key competencies:**
  Opportunities for analytical thinking and systems understanding. I hope this is approached in a way that supports all learners, not just the academically inclined.
- **Access and challenge for all students:**
  The language and calculation-heavy outcomes could be a barrier for some. Visual explanations, defined calculations/formulae, simplified case studies, and hands-on demonstrations would help bridge this.

Additional Assessment Component (AAC)

The design and manufacture project provides an opportunity for students to display evidence of their learning across all strands of the specification. The senior cycle key competencies of thinking and solving problems, being creative, communicating, working with others, and managing learning and self, developed through working

with learning outcomes across the specification, will be applied through the student's engagement with the project.

A Design and Manufacture Project brief will be issued annually by the SEC. The brief will set out the requirements for the Design and Manufacture Project and will:

- set a context for the project
- provide guidance to students in the development of their project work
- allow students to develop their knowledge and understanding in areas related to the brief
- facilitate teachers and students in their planning.

This experience will allow students to demonstrate their creativity, showcase the breadth and depth of their practical and manufacturing ability, and refine their communication techniques as they develop, implement, and document their progress through the design and manufacturing process.

Please provide specific feedback / observations / comments on the AAC in Leaving Certificate Engineering with reference to how the AAC might motivate students, how it aligns to the learning outcomes in the specification and how it facilitates the development of key competencies.

I welcome the Additional Assessment Component. It's an effective way for students to demonstrate practical skills, creativity, and problem-solving in an authentic context. Students benefit from tasks that reflect the real process of designing, making, and evaluating. It also affords students the opportunity to follow a project, from inception to design to realisation to evaluation, and to document this journey.

However, I strongly support and urge the inclusion of a second additional assessment component, like a structured skills assessment (like the proposed Craft Skills Assessment in Construction Technology), which will offer a more balanced way to assess skill-based learning, especially for students who excel in 'doing' over 'documenting'. The inclusion of this skills assessment would ensure that students are examined on the practical skills of machining, accuracy, precision, high quality surface finishing, working within tolerances and allowances, and safe working practices. Some students will have practiced and honed these skills over the prior 2 or 5 years, and this will be the opportunity to be rewarded for these as part of their final LC Engineering grade. It also links directly into manufacturing industry, and allows students to progress directly to industry with the basic skills and understanding that they need to have.

I would suggest that the following assessment structure be used:
40% written assessment – assess theoretical knowledge, acquired over a period of study in the subject

30% design and make project – assess problem solving, design ability and documentation skills
30% practical skills examination – assess skills, technical competence, precision and assembly in a controlled and time limited situation.

Supports for Successful Enactment

Please provide specific feedback / observations / comments on supports that might be needed for successful enactment of this subject specification.

- **Teacher Training:**
  Ongoing CPD will be crucial — especially for teachers new to digital tools or automation topics.
- **Financial support:**
  Workshops need to be equally resourced with the most up to date and relevant equipment – bench and machines. These need to be properly serviced and maintained as well – ring fenced funding would be required here.
- **Links with Industry:**
  There are fantastic opportunities to forge links between school, students and industry in this specification. Assisting schools in linking in with industry should be a key approach to the implementation of this subject specification.
- **Parental Understanding:**
  Consider short guides or videos to help parents understand what Engineering involves — and how to support students.