



EPC Representative Consultation Response to Engineering Council AHEP Survey - August 2019

Overview

- The reduction in the number of learning outcomes (LOs) is welcome. This will aid consistent interpretation of the guidelines and may suit better the common use of 30 credit modules in engineering programmes.
- We would prefer sub-competencies to be split into separate entities instead of using “and” or “or”. Explicit statements of each sub-skill lend themselves to a clearer set of rules. We are expecting our students to engage with these statements and it is helpful for those with English as a second language to have shorter, more concise, statements.
- The reduction in LOs means that we may now have a greater number of non-technical requirements.
- Greater clarity would be appreciated in differentiating between BEng and MEng criteria.

Maths and Science

- “Wider multi-disciplinary context of engineering” is ambiguous. Do you mean multi-disciplinary to include disciplines outside engineering? Real engineering commonly works with other disciplines, so it would seem vital that this scope be included.

Engineering Analysis

- M2 needs to mention limitations too I think, even for ‘hand-cranked’ analysis. This is explicitly mentioned on M3 for computer analysis.
- Modelling is not explicitly mentioned. ‘Model’ is used, but I think this might get misinterpreted as simply draw in 3D. Modelling is important.
- EA – qualitative and quantitative analysis need some elucidation – each is important.
- The existing EA6 – “Ability to extract and evaluate pertinent data” is a key LO. In the modern world of data-overload, removing extraneous data to focus on key indicators is a skill set that is very important to Engineers.
- Something more on working with uncertainty. This is not the same as incomplete data; every measurement, no matter how carefully taken, has an associated uncertainty and this needs to be accounted for in the analysis.

Design

- Existing D1 “...evaluate business, customer and user needs, ...” was good actually and spoke to capturing requirements, which is a key skill. I think there needs to be something explicit on requirements. The ‘design’ part can’t actually begin until you fully understand the need.
- There is nothing explicit on the design process itself. This is an important skill and needs capturing.
- Tolerances / uncertainty is not mentioned. Tolerances in design are critical.
- The difference between the M level and B level abilities is limited. Maybe consider emphasizing complexity / innovation / inter-disciplinarity / etc at M-level.

The Engineer and Society

- Most of these are good, but many need more differentiation between Bachelor’s and Master’s levels.
- M6 – good, maybe add to M-level “whole life / process considerations” to account not just for the sustainability impact of the product but also what it consumes or emits during operation, how it is made and how it is recycled or disposed of.
- M8 – Not just use but conceive and operate, or similar.
- M9 – This could be interpreted with great latitude.
- M10 – synthesis might be extended beyond conclusions to invention / development.
- M11 – Good that material selection is mentioned, but arguably this sits better in the Design section.
- EP3 is Missing! – “apply relevant practical and laboratory skills”? Engineers are commonly experiential learners. Ensuring that all students have the opportunity to experience these activities enables them to enter the world of work with some confidence in their practical abilities. Students that are lucky and have engineering role models at home may already have a great deal of experience, however, if we are to encourage minority groups, first-in family university students and women, it will be essential to ensure that they have all been able to experience practical engineering. In fact, making these activities more prominent may well encourage a wider range of potential students to consider engineering. Without this requirement, many institutions (where space and technician support is extremely expensive to maintain) will be tempted to reduce or lose their laboratories and workshops. There is no greater teacher than failure... and it is important that our students can fail safely in a supportive environment... rather than at a workplace.

There has been a sense of need for clarity around the emphasis and need for engineering science and maths as due to the reduction in LO’s. Though welcome, the imbalance could imply there is less need for these in an engineering curriculum. Perhaps an overarching statement about the need for science and mathematics at a level appropriate for the engineering specialism would cover this aspect.

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These comments have been compiled on behalf of the EPC Board by Dr Georgina Harris as a reflection of an opinion-gathering exercise among the EPC membership. This activity was supported by a team of board members, Professor Lisa Brodie, Professor Dave Allan, Professor Gill Cooke and Professor Colin Turner. For further information, please contact Johnny Rich, Chief Executive, EPC (j.rich@epc.ac.uk)