

# Designing Transdisciplinary Engineering Programmes: A new wave in engineering education

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**Abstract.** Traditional engineering programmes equip graduates with knowledge and skills that enable them to achieve great technological advancements. However, one of the flaws of current programme design is that what is taught is often compartmentalised into pockets of knowledge potentially leading to a loss of perspective. Engineering students are highly applied and solution-oriented, but many times do not hold a holistic view of other associated professional dimensions. This can be detrimental in fast-paced changing environments, where they are exposed to global challenges spanning multiple disciplines. The question is *how can we, as educators, overcome these flaws?*

We argue that providing innovative engineering education programmes that combine technical training and skills with social-scientific and policy knowledge is key. This creates the premises for new generations of graduates who possess a transdisciplinary skillset thus “speaking multiple professional languages” and filling a clear gap on the employment market, as studies have shown.

We present a case-study focused on the new engineering programme at University College London (UCL): the BSc Science and Engineering for Social Change. Here, we offer students an authentic learning experience using project and problem-based approaches to contextualise learning in diverse environments. Projects are set in collaboration with community partners who provide real-world socio-technical challenges for students to solve. Students get to simultaneously apply the technical and social science skills they learn, constituting a true transdisciplinary engineering experience enabling them to thrive in the professional world.

**Keywords.** Engineering education, social change, transdisciplinarity, problem and project-based learning

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