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Analysis and Development of Innovative Engineering Programmes

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Abstract: *This paper presents a method of analysis and, potentially, design of innovative engineering programmes, mainly focusing on the level of interaction between engineering disciplines, meeting requirements for professional accreditation and meeting requirements for the skilled work-force in the place of implementation. The programmes are in line with the standards of the UK Engineering Council. Hence, design of curricula had to encompass a number of elements, and demonstrate that they are safeguarding the quality requirements of the professional engineering institutions. The core building construct is outlined. The proposition is developed that sharing components of engineering programmes of study across diverse disciplines is beneficial in preparing students for engineering of the future. Some metrics are proposed, based on fuzzy logic approach to establish membership functions for measuring interaction between the programmes, and the emphasis of the programmes on particular aspects of engineering learning outcomes. It is demonstrated how such metrics can be used in designing and analysis of modern engineering programmes. Furthermore, to exemplify the proposed approach, the paper outlines the methodology of establishing and analysing the link between academic contents and practical "shop-floor" skills, both of which are required from engineers in modern industry. It is felt that the approach used and the experiences gained may assist academics who are considering establishing similar or related type programmes of study and may also be of value to institutions undergoing transformation.*

Keywords: *Professional Engineering Competencies, System based curriculum design, Mapping of learning outcomes, Curriculum design, Workshop skills*