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Design and Evaluation of an MSc Module in Communications and Information Engineering

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Abstract

The rapid development of communications and information technologies presents ongoing challenges for master's-level engineering education, particularly in designing curricula that balance advanced theoretical foundations with practical and research-oriented skills. This paper presents the design and evaluation of an MSc module in Communications and Information Engineering delivered within a UK university context. The module was structured to support postgraduate engineering students in developing a deep conceptual understanding of modern communication systems while strengthening analytical, implementation, and problem-solving capabilities. The pedagogical design integrates lectures with advanced laboratory activities, project-based coursework, and simulation-driven system analysis. Research-informed content and contemporary engineering case studies were embedded to align learning outcomes with both industrial practice and doctoral research expectations. A mixed-methods evaluation approach was adopted. Quantitative data were collected through pre- and post-module student surveys and analysis of assessed work, including laboratory reports, design projects, and examinations. Qualitative insights were obtained from semi-structured student interviews focusing on learning progression and skill development. The evaluation results indicate that the integrated module design enhanced student engagement, conceptual clarity, and confidence in applying theoretical models and signal-processing techniques to realistic engineering problems. The findings demonstrate that a structured, implementation-oriented approach is effective for MSc-level education in Communications and Information Engineering and provide evidence-based insights for the design of postgraduate engineering modules in rapidly evolving technological domains.

Keywords: MSc Engineering Education; Communications and Information Engineering; Module Design and Evaluation; Postgraduate Curriculum; UK Higher Education