

Implementation of a project-based telecommunications engineering design course

Abstract

This paper describes and discusses the implementation of a project-based graduate design course in telecommunications engineering. This course, which requires a combination of technical and soft skills for its completion, enables guided independent learning (GIL) and application of technical knowledge acquired from classroom learning. Its main implementation challenge is the need for instructors to define graduate-level GIL activities that are unique for the project objectives and scope. This process is required at both the system and subsystem levels. These activities must also satisfy the program learning outcomes and course outcomes (PLOs and COs). The course initiation, implementation, and management are first described from the instructor's perspective. Technical specifications and outcomes from a recently implemented project titled "A Human-Inspired Telecommunication System" is taken as a case study. Besides explaining the methodology used to evaluate both the course and the students, an empirical assessment of PLOs and COs against the associated educational activities is also presented. Results of a student exit survey, in which each instrument was mapped to specific COs, indicated that the intended course objectives had been accomplished and that there was a good level of student satisfaction.

Keywords; Biomimetics, Communication engineering education, Direction-of-arrival (DoA) estimation, Student experiments