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Teaching Engineering Design Through LEGO Mindstorms

This paper examines a particular methodology of teaching engineering design to undergraduate engineering students, which relies on Lego Mindstorms. A number of important issues are addressed, including the timing of the design module within the programme, prior knowledge required and assessment components. The module, which has been running for three years, was found to have many positive attributes, not only in relation to the core design activity, but also in generating good team building and engaging students with the degree programme. In terms of its implementation, the module is front loaded with a series of lectures on design methodologies along with a series of examples and the remainder of the module consists of supervised (3 hours per week) and unsupervised (3 hours per week) laboratories where students complete a significant practical design assignment. This assignment consists of building a mobile robot to perform a certain task e.g. negotiate an obstacle field, retrieve an object or play football! The assignment requires both design of the robot hardware and software. The assignment is assessed through report, practical demonstration (including a competition) and presentation, as well as presentation of a preliminary work plan.

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