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Paper

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High-flying Linkage to Industry and Postgraduate Opportunities With Unmanned Aerial Vehicles

The paper describes how undergraduate linkages to opportunities for postgraduate work and employment in industry were developed during the final two years of the Mechatronics and Mechanical Engineering degrees at the University of Tasmania (Australia). The linkages were created by integrating introductory course material and activities that introduced undergraduates to current developments and issues in the profession and by exposing them to current industry design and prototyping issues. In the project described here, the material centered on unmanned aerial vehicle (UAV) design, which was carried out in close cooperation with the Australian Antarctic Division, the Antarctic Cooperative Research Center (Hobart, Tasmania) and industry representatives. The students' aim was to investigate design and development of UAV's for use in Antarctica - a very remote site. In third and fourth years, standard lecture material was integrated with specific UAV topics targeted to be relevant to both postgraduate research and industry needs. The UAV topics were incorporated as group practical and project material, and involved developing designs, writing reports and delivering presentations to their peers, staff in the engineering school and external industry representatives who acted as "examiners". The students, working in groups, developed skills in conceptual design, partitioning of tasks, communication, cooperation and experience in group dynamics. This situation simulated what may be expected when working in a team in industry or as part of a postgraduate research group. The topical nature of UAV's, together with the contact with industry representatives and the real opportunity to develop UAV's for use in Antarctica, led to high levels of motivation and enthusiasm within groups and individual students. Students were exposed to the process of moving from University course-work, to performing useful industry relevant design, research and development and bringing awareness of how to move to postgraduate and industry work on completion of their undergraduate study. It is hoped that the students can extrapolate this knowledge to other areas of the course and to other industrial applications. The overall aim of the project was to help the School graduate students who are able to quickly appreciate current industry needs, and who understand the pathways to, and the personal and industrial benefits, of applied postgraduate research. The project has been successful in attracting industry and central University financial support and will continue as part of the School's ongoing teaching innovations. To quantify any success, student response was evaluated using a questionnaire on teaching and learning outcomes and the grades achieved by the students were compared to those normally achieved. Questionnaire responses indicated that the student body much preferred the new industry based teaching approach to that of the historical "chalk and talk". There was also a 100% success rate for that part of the course relating to the new material, with a median score of 67%, which was well above average for the school.