

## The CQU Diploma of Professional Practice – Explicitly preparing WIL students

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### **ABSTRACT:**

The Diploma of Professional Practice at Central Queensland University has been developed to explicitly prepare students in the Bachelor of Engineering (Co-op) program for their industrial work placement, and then to enable them to articulate the learnings from that placement. The Diploma is a compulsory element of the Co-operative Education program, and awarded as the dual award BEng (Co-op)/Dip Prof Prac Eng at graduation.

The Diploma of Professional Practice, equips graduates with the knowledge, skills and attributes needed in professional practice and for professional leadership. The combined program is designed around the triple themes of intellectual, social and professional development. A feature of the professional practice program is its integration with the periods of work placement in a professional environment that provides the opportunity to learn and put into practice, professional practice skills. The existing work placements are highly regarded by employers, and this program provides students with the education to maximise the learning occurring in the professional environment. The program is structured with internal courses delivered before and after work placement periods which provide preparation and review of skills, that will be put into practice in the work place, as well as reflection on the learning.

The program is a generic program providing students with the necessary professional practice skills to go into the placement and the opportunity to reflect upon their experiences in the workplace. It is through this reflective process that the implicit learning from the work placement becomes explicit assessable learning.

### **PROFESSIONAL PRACTICE - PHILOSOPHY AND IMPLEMENTATION**

It is well recognised that educators now need to develop graduates with attributes and abilities previously not considered core to their professional practice. According to a review of Australian engineering education steered by the Institution of Engineers, Australia (IEAust, 1996) future accreditation of engineering courses will depend upon demonstrated development of attributes including effective communication, the ability to work in multi-disciplinary teams, utilisation of a systems approach to design, and an understanding of the social, cultural and ethical responsibilities of the professional engineer.

Partially as a result of this, moves were made to redefine professional engineering practice (Thom, 1998). Global conferences have since called for the development of generic attributes in engineers, which encompass the multi-faceted concepts of engineering practice (Boeing Company and Rensselaer Polytechnic Institute, 1997). Sustainability is becoming the basis of how holistic engineering practice is developed. As the concept of sustainability stands on the three legs of economic, environmental and social sustainability, engineering as a profession, in order to embrace the concept of holistic practice, must first develop an understanding of individual and societal needs (Crofton, 1998). Students need to not only be aware of, but have the opportunity to prepare, practice, and reflect upon these issues.

Since the inception of the BEng(Co-op) program in 1994 by the formerly James Goldston faculty of engineering, graduates have demonstrated good professional practice skills. These had resulted from professional practice skills training, delivered by the faculty, and the opportunity to work in industry where they can use and develop these skills. Upon their return to the academic environment, they were encouraged through reporting requirements for their work placement, to reflect upon how those issues had impacted their placement. These learning opportunities however were not formally recognised by the university, (except in the assessment of the work placement report) and were not credited towards their degree. This lack of recognition and credit was the motivation for the development of a Professional Practice program. This program replaced and extended material previously provided in the Work Placement courses of the Engineering Co-op Program.

### *Engineering Professional Practice*

The Diploma of Professional Practice, integrated with the Project Based Learning (PBL) Bachelor of Engineering (Co-operative Education), aims to explicitly equip graduates with the knowledge, skills and attributes needed in professional practice and for professional leadership. The combined program is designed around the triple themes of intellectual, social and professional development. (JJames Goldston Faculty of Engineering and Physical Systems [JGFEPS], 2004a)

A feature of the professional practice program is its incorporation with the periods of work placement in a professional environment that provides the opportunity to learn and put into practice, professional practice skills. The existing work placements are highly regarded by employers, and this program provides students with the training and education to maximise the learning occurring in the professional environment. The program is structured with internal courses delivered before and after work placement periods to provide necessary preparation and review of skills, which are then put into practice in the work place. They also require reflection on the learning.

The new program separates the professional development components previously combined with the BEng(Co-op) work placement courses and presents them in an explicit program. This explicit program provides students with due recognition of their professional practice skills. This program is now integrated with the BEng(Co-op) program to form a dual award program known as Bachelor of Engineering (Co-op)/Diploma of Professional Practice (BEng(Co-

op)/DipProfPrac(Eng)). With the introduction of this dual award, the BEng(Co-op) is no longer offered as a stand alone program.

### *Professional Practice Program Structure*

The structure of the Diploma of Professional Practice program element of the dual award program is as shown in Table 1 below.

Table 1 Professional Practice Element of the Co-operative Education Engineering Program

Course	Units of Credit	Comments
Professional Practice Preparation 1 (PPP1)	6	Covers resume writing, interview skills, ethics, health and safety, industrial relations– prior to 1 <sup>st</sup> work experience
Professional Practice Review 1 (PPR1)	6	Covers documentation of actual work experience using competency framework, formal presentation of work experiences, shared reflection workshops.– following 1 <sup>st</sup> work experience
Professional Practice Preparation 2 (PPP2)	6	Covers additional engineering workplace skills similar to first line supervisors course.– prior to 2 <sup>nd</sup> work experience
Professional Practice Review 2 (PPR2)	6	Covers documentation of actual work experience using competency framework, formal presentation of work experiences, shared reflection workshops.– following 2 <sup>nd</sup> work experience
Work Experience 1 (WE1)	6	Formal course structure to match work experience period. Each course of nominal 12 weeks duration. Assessment limited to weekly activity and reflection journals and self-established job objectives.
Work Experience 2 (WE2)	6	
Work Experience 3 (WE3)	6	
Work Experience 4 (WE4)	6	

### *The Courses*

Professional Practice Preparation 1 (PPP1) is designed to prepare the second year students for their first work placement. These students have 2 years of technical study, but need to be “work ready”. The faculty recognized that if the students are in the workplace for only six – eight months, then they need to be of value to the employer from the start. In the same way that the technical study had been specifically chosen to ensure that they were capable of performing worthwhile engineering work, the professional practice course was designed to ensure that they were not lost in a professional environment. The course covers:

- Resume and letter writing skills
- Responding to selection criteria
- Interview techniques
- The transition from study to work
- Employment contracts and conditions
- Identifying the industry and types of employer they hope to be involved with as an engineering practitioner

- How to evaluate their own work in terms of the Engineers Australia National Competencies
- Critical engineering workplace issues including ethics, codes of conduct and OHS.

Additionally the students attend the presentations given by the third year students who have just returned from their work placement. These presentations allow the students to hear what the actual placements were like. What the students gained from the experience? What were the conditions? What were the issues?

Professional Practice Review 1 (PPR1) is designed to have the students reflect on their first placement. They must describe their company, their department and their employment conditions. They must also give a description of the work that they did, what projects they were involved in and how the work was achieved. They are asked to reflect on their competence in the position. They must then reflect upon what was achieved by the work, and identify what contribution they made to the company, and the significance and value of the experience to themselves, as well as any specific learnings. They must do a self evaluation of their personal growth in the areas of intellectual, social and professional growth. This is not just identifying their growth, but articulating the change in themselves that demonstrates that the growth has occurred. Finally they must articulate and analyse the workplace issues that they had to deal with.

As part of demonstrating that they are addressing professional growth, they are asked to write a career episode report. This is a document that will form part of their engineering practice portfolio for application to become a Chartered Professional Engineer (CPEng).

Professional Practice Preparation 2 (PPP2) is taken by the fourth year students, preparing them for their second work placement, and follows on from PPP1. It has the students investigate:

- Their skills and attributes
- Professional responsibility
- Career exploration
- Career management
- Further interview skills
- Further review of Engineers Australia National Competencies for CPEng

Once again the students attend the presentations by the fifth year students returning from their second work placement.

Professional Practice Review 2 (PPR2) follows the same format as PPR1. The students reflect on their work placement and present their reflections to the class. This sharing of reflections allows the students to compare their experiences and identify common issues and share solutions that they have developed to those issues. Additionally they are asked to reflect on their career planning process, and to evaluate their ability to function in their chosen career.

*The Dual Award*

In 2005 the BEng(Co-op) was replaced by the new integrated dual award program, named the Bachelor of Engineering (Co-op)/Diploma of Professional Practice (Engineering). The new structure is shown in Table 2 below.

Table 2. Bachelor of Engineering (Co-op)/Diploma of Professional Practice (Engineering)  
Program Structure (Post June 2004)

YEAR	TERM 1	TERM 2
1	Lecture Based Course	Lecture Based Course
	Lecture Based Course	Lecture Based Course
	Project Based Course	Project Based Course
2	Lecture Based Course	Lecture Based Course
	Lecture Based Course	Lecture Based Course
	Project Based Course	Professional Practice Course
		Project Based Course
3	Work Experience – Industry Placement External Study Course	Lecture Based Course
		Lecture Based Course
		Professional Practice Course
		Project Based Course
4	Lecture Based Course	Work Experience – Industry Placement External Study Course
	Lecture Based Course	
	Professional Practice Course	
	Project Based Course	
5	Lecture Based Course	Graduation
	Lecture Based Course	
	Professional Practice Course	
	Project Based Course	

Whilst this appears to be an increased load for students, as to some extent it is, it formally recognises additional learning that students were, to a large extent, already undertaking previously in preparation for, and reflection after completion, of their work placements.

### *Implementation*

The Diploma of Professional Practice program was developed to separately formulate, recognise and extend the professional development components previously implicitly combined with the work placement courses and presents them in an explicit program. The program is a generic program designed to provide students with the necessary professional practice skills to go into the placement and the opportunity to reflect upon their experiences in the workplace. It is through this reflective process that the implicit learning from the work placement becomes

explicit assessable learning. Graduates of this dual award program have demonstrated the knowledge, skills and attitudes needed for professional engineering practice and leadership. This encompasses academic knowledge and skills with engineering discipline theory, technical expertise, personal development and professional formation. In particular this program enables specific and measurable development of professional engineering practice skills, employment readiness, social awareness and lifelong learning attributes (James Goldston Faculty of Engineering and Physical Systems [JGFEPS], 2004b)

This program is similar to one offered at the University of Technology, Sydney (UTS), called a Diploma of Engineering Practice. (University of Technology, Sydney, 2005). This means there are now two engineering faculties in Australia offering a dual award incorporating co-operative education and professional practice. This is evidence that there is an increasing perception amongst industry and educators that the professional practice skills require explicit development and recognition.

## CONCLUSION

It is well recognised that co-operative education is capable of informing, or even to some extent, enhancing the development of a graduate's generic skills. This can even be achieved from exposure to the work place. However, incorporating and integrating explicit professional practice skills development, enables a significant internalisation of professional practice. This professional practice includes generic and technical knowledge, skills and attitudes. The internalisation occurs through identifiable preparation for, application in, and considered reflection of, learning experiences.

CQU has developed an integrated Bachelor of Engineering program, incorporating co-operative education and specific development and recognition of professional practice skills. This program is believed to be unique in the world with its interpretation and combination of these learning paradigms. It has taken 14 years of development within the university to reach this stage with parallel developments nationally and internationally informing and shaping its structure. Whilst a significant achievement in its own right, the program as it now stands, should be considered as a staged step in the engineering program's development continuum.

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