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## An Evaluation of Programme Educational Objectives and Programme Outcomes for Civil Engineering Programmes

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### Abstract

The Department of Civil & Structural Engineering at the Universiti Kebangsaan Malaysia (UKM) offers two Civil Engineering undergraduate programmes. This study is to evaluate the achievement of Programme Educational Objectives (PEOs) by indirect assessment consists of parents, alumni and employer surveys, while the Programme Outcomes (POs) is done by surveys on graduating students, industrial training employers, alumni and industry employers. The scores used for the surveys are on a scale of 1 to 5. Generally, the results for PEOs and POs from the surveys indicated most of the ratings are between 3 and 5. This is an indication that the PEOs specified for the programme are achieved.

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### 1. Introduction

The Department of Civil & Structural Engineering is one of five departments at the Faculty Engineering and Built Environment, Universiti Kebangsaan Malaysia, offering Bachelor of Civil & Structural Engineering and Bachelor of Civil & Environmental Engineering for undergraduate students. The department strives to provide quality education and prepares students for various fields in the construction industry, commerce and academia. The comprehensive and innovative course contents and teaching techniques are designed towards expanding the frontiers of learning and inculcating a probing mind by implementing outcome-based education. Students are trained to develop into multi-skilled professionals possessing mental, intellectual and emotional fortitude to succeed. Evaluating the Programme Educational Objectives (PEOs) and Programme Outcomes (POs) of both programmes will show that the Civil & Structural Engineering Department strives to continually pursue its commitment to provide high quality engineering education. Improvements made in the curriculum, the delivery and assessment reflect the needs of the stakeholders (students, parents, alumni, employers and nations) and industry are fulfilled. This paper is thus prepared to assess the achievement of PEOs and POs for both programmes.

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## 2. Programme Educational Objectives (PEO)

Realising the needs and requirements of the stakeholders, both programmes have underlined long-term objectives for all students to be achieved within 3 to 5 years upon graduation. The latest discussion on reviewing PEOs development was done in January 2009. The current PEOs are presently reduced to four so that it is achievable, and the performance indicator measurable. Taking into consideration comments from Engineering Accreditation Council (EAC) panel visit in 2008, the PEOs for the programme have been reviewed and consolidated in 2009 into four Programme Educational Objectives. PEOs for both Civil & Structural and Civil and Environmental Engineering Programmes are distinguished by their own specific specialization fields. Improved performance indicators are incorporated such that the PEO achievements are measurable within 3 to 5 years upon graduation (EAC Manual, 2008). The following are the latest PEO statements, detailed descriptions and their performance indicators for the current PEOs.

*PEO 1 An engineer who develops career in Civil Engineering with specialization in environmental/structural field.*

He/she should be a competent engineer with a strong understanding of fundamental engineering knowledge. During the engineering practice he/she will uphold the Malay Language as a language of knowledge in the engineering field while having the ability to communicate in English, which is in line with UKM's mission to be the premier university that affirms and promotes the value of the Malay Language while globalising knowledge through the framework of the national culture. This is a unique feature of the programme at UKM, which can be considered to be a special niche that differentiates UKM's programme from other universities. The performance indicator is to achieve at least 5% of the graduate involved in specialised field within 3 to 5 years upon graduation. Another indicator for a successful engineer is achieving 5% of the graduate having senior positions. PEO1 also acknowledge the requirement of producing leaders as indicated by 5% of the graduates who will become project leaders in their respective organisations, which is actually in line with the vision of the UKM which is committed to be the leading university that pioneers innovations in creating a dynamic, knowledgeable and ethical society.

*PEO 2 An engineer who obtains and maintains professional status with Professional Bodies (e.g. Board of Engineers Malaysia, BEM).*

He/she should possess professional attitudes and ethics necessary in fulfilling his/her responsibilities towards the Creator, client and the society, which is responding to the philosophy of the university. The performance indicator for PEO2 are to achieve 5% of graduates obtained professional engineering status after 6 years, 10% obtained professional engineering status after 10 years, 10% registered as specialist consultant and 30% registered as membership in international bodies.

*PEO 3 An engineer who pursues lifelong-learning and advance knowledge.*

This is directly linked to UKM's position as a Research University as identified by the Government of Malaysia for research on engineering problems and innovation. The performance indicators for PEO3 are to achieve 10 % of graduates pursue academic career, another 10% pursue postgraduate studies/second degree and 5% involve in academic publications.

*PEO 4 An engineer who is able to progress to the regional & international work environment.*

It is corresponding to the mission of the university. The performance indicator to assess achievement of PEO4 are 10% of the graduates employed in international companies/ international projects, and 5% work overseas to be achieved within 3 to 5 years upon graduation.

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