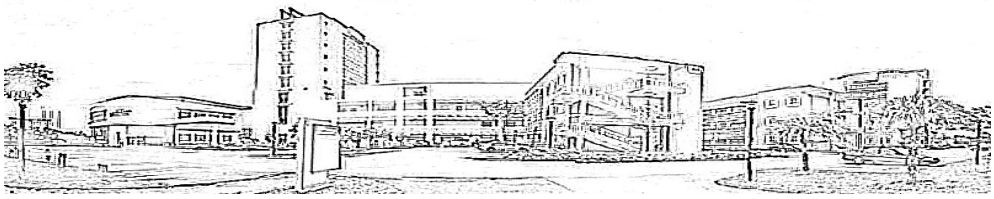
OUTCOME-BASED EDUCATION

IN FKAAS

OBE REPORT 2016 – 2018



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1 INTRODUCTION

1.1 OBE in FKAAS

Outcome-based Education (OBE) best practices have been the emphasis in the Civil and Environmental Engineering Faculty (hereafter abbreviated as FKAAS) of UTHM.

The direct and indirect measurements of OBE, both quantitative and qualitative to exhibit the attainments of Programme Educational Objectives (PEO), Programme Learning Outcomes (PLO) and Course Learning Outcomes (CLO) in the Bachelor in Civil Engineering with Honours (BFF) programme for the years 2016 to 2018 are presented herein.

Continuous activities related to OBE are common in FKAAS to ensure the success of OBE implementation within the whole faculty. These activities, not including teaching and learning activities for the years 2016, 2017 and 2018 are summarised in Table 1-1, Table 1-3 and Table 1-3, respectively.

The BFF programme is an undergraduate programme 4 year programme that carries a total of 136 credits, and of which 94 credits are for Core Engineering courses. This programme is developed with a framework to establish 4 Programmed Educational Objectives (PEO) as shown in Table 1-4. The mapping relationship of PEO to Programme Learning Outcomes (PLO) is also presented in the same table.

BFF programme in FKAAS adheres to 13 PLO, of which 12 PLO has direct reference to the Engineering Accreditation Council (EAC) Manual 2012, and 1 PLO on entrepreneurial skills referenced to the Malaysian Qualifications Framework 2011. Table 1-5 elaborates all the 13 PLO in detail relating each PLO to one Primary Domain and linking the FKAAS PLO numbering to the PLO numbering in the EAC Manual 2017.

Table 1-1. Summary of FKAAS OBE activities year 2016

No	Activity/ Programme	Date	Objective	Outcome
1.	OBE workshop	2-3/02/2016	Preparation of OBE annual report for BFF Program, FKAAS	All OBE committee took action on that particular matter
2.	Fundamental Civil Engineering Exam (FCEE)	6/2016	PLO direct measurement on Final Year Students in IDP	Evaluation of PLO achievement on Final Year Students
3.	FKAAS OUTCOME-BASED EDUCATION SURVEY FOR STAFF 2016	18/8/2016 - 7/9/2016	Online (google form)	Study the implementation and understanding of PEO among staffs FKAAS
4.	CLO-PLO analysis	8/2016	Analysis of PLO	Evaluation of PLO achievement
5.	FKAAS OUTCOME-BASED EDUCATION SURVEY FOR STUDENTS 2016	4/9/2016 - 22/9/2016	Online (google form)	Study the implementation and understanding of PEO among students FKAAS
6.	Exit Survey by Graduates (Google form)	9/2016	To collect data for exit survey.	Exit survey data collected
7.	Fundamental Civil Engineering Exam (FCEE)	11/2016	PLO direct measurement on Final Year Students in IDP	Evaluation of PLO achievement on Final Year Students
8.	Activity of sending tracer study to alumni and employer (Google form)	11/2016 - 12/2016	To collect data for tracer study.	Tracer study data collected

Table 1-2. Summary of FKAAS OBE activities year 2017

No	Activity/ Programme	Date	Objective	Outcome
1.	OBE meeting	21/02/2017	Form of TEAM OBE for 2017 and distribution task force.	All OBE committee took action on that particular matter
2.	Fundamental Civil Engineering Exam (FCEE)	5/2017	PLO direct measurement on Final Year Students in IDP	Evaluation of PLO achievement on Final Year Students
3.	OBE workshop	25-26/07/2017	Preparation of OBE annual report for BFF Program, FKAAS	All OBE committee took action on that particular matter
4.	Workshop to prepare FCEE new questions	15/3/2017 & 12/4/2017	Prepare and check new questions for FCEE	All departments in FKAAS take part to prepare new sets of FCEE exam.
5.	CLO-PLO analysis	8/2017	Analysis of PLO	Evaluation of PLO achievement
6.	Awareness meeting for staffs in FKAAS	21/09/2017	Brief to staffs about awareness of OBE and OBE system in TCIS to all academic staffs	All academic staffs
7.	Activities of Exit survey by Graduates.	9/2017	To collect data for exit survey.	Exit survey data collected
8.	Fundamental Civil Engineering Exam (FCEE)	11/ 2017	PLO direct measurement on Final Year Students in IDP	Evaluation of PLO achievement on Final Year Students
9.	Activity of sending tracer study to alumni and employer (Google form)	11/2017	To collect data for tracer study.	Tracer study data collected

Table 1-3. Summary of FKAAS OBE activities year 2018

No	Activity/ Programme	Date	Objective	Outcome
1.	Fundamental Civil Engineering Exam (FCEE)	May 2018	PLO direct measurement on Final Year Students in IDP	Evaluation of PLO achievement on Final Year Students
2.	CLO-PLO analysis	August 2018	Analysis of PLO	Evaluation of PLO achievement
3.	Planning Meeting for Stakeholders Symposium 2018 (1)	6 August 2018	To plan the stakeholder symposium	Planning of stakeholder symposium on October 2018
4.	Planning Meeting for Stakeholders Symposium 2018 (2)	27 August 2018	To plan the stakeholder symposium	Planning of stakeholder symposium on October 2018
5.	Planning Meeting for Stakeholders Symposium 2018 (3)	25 September 2018	To plan the stakeholder symposium	Planning of stakeholder symposium on October 2018
6.	Activities of Exit survey by Graduates.	Sept-Oct 2018	To collect data for exit survey.	Exit survey data collected
7.	Activity of sending tracer study to employer (google form)	Sept 2018	To collect data for tracer study.	Tracer study data collected
8.	Planning Meeting for Stakeholders Symposium 2018 (4)	8 October 2018	To plan the stakeholder symposium	Planning of stakeholder symposium on October 2018
9.	Fundamental Civil Engineering Exam (FCEE)	November 2018	PLO direct measurement on Final Year Students in IDP	Evaluation of PLO achievement on Final Year Students

Table 1-4. Programme Educational Objectives (PEO) of Bachelor of Civil Engineering with Honours

PEO	Educational Objectives of BFF Programme are to produce civil engineers who are	Mapping of PEO to PLO
1	Knowledgeable and technically competent in civil engineering discipline in-line with the industry requirement	PLO 1, 2, 10
2	Effective in communication and demonstrate good leadership quality in an organization	PLO 3, 5, 9, 13
3	Capable to solve civil engineering problems innovatively, creatively and ethically through sustainable approach	PLO 4, 8, 11, 12
4	Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement	PLO 6, 7

Table 1-5. Programme Learning Outcomes (PLO) of Bachelor of Civil Engineering with Honours

PLO	Key Outcome	Description of Learning Outcome
1	Engineering Knowledge (K)	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to the solution of complex civil engineering problems. Primary Domain: COGNITIVE PLO 1 in EAC Manual
2	Practical / Technical Skills/ Modern Tool Usage (PS)	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex civil engineering activities, with an understanding of the limitations. Primary Domain: PSYCHOMOTOR PLO 5 in EAC Manual
3	Communication Skills (CS)	Communicate effectively on complex civil engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. Primary Domain: PSYCHOMOTOR PLO 10 in EAC Manual

4	Critical Thinking and Problem Solving / Investigation (CTPS)	Conduct investigation into complex problems using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. Primary Domain: COGNITIVE PLO 4 in EAC Manual
5	Individual and Team Work (TW)	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings Primary Domain: AFFECTIVE PLO 9 in EAC Manual
6	Life Long Learning (LL)	Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Primary Domain: AFFECTIVE PLO 12 in EAC Manual
7	Entrepreneurship Skills (ES)	Self-motivate and enhance entrepreneurship skills for career development Primary Domain: PSYCHOMOTOR In MQF
8	Ethics and Professionalism Values (ET)	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. Primary Domain: AFFECTIVE PLO 8 in EAC Manual
9	Leadership Skills / Project Management and Finance (LS)	Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments. Primary Domain: PSYCHOMOTOR PLO 11 in EAC Manual

10	Design / Development of Solutions (DDS)	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. Primary Domain: COGNITIVE PLO 3 in EAC Manual
11	Problem Analysis (PA)	Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. Primary Domain: COGNITIVE PLO 2 in EAC Manual
12	Environment and Sustainability (ESus)	Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts. Primary Domain: AFFECTIVE PLO 7 in EAC Manual
13	The Engineer and Society (ESoc)	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. Primary Domain: AFFECTIVE PLO 6 in EAC Manual

The relationship and distribution of courses under BFF programme to PLO is presented in Fig. 1-1 to Fig. 1-4. The dominant level in each taxonomy domain is C4, P4 and A3, respectively, for Cognitive, Psychomotor and Affective domains. This is consistent with the undergraduate programme level of expectancy.

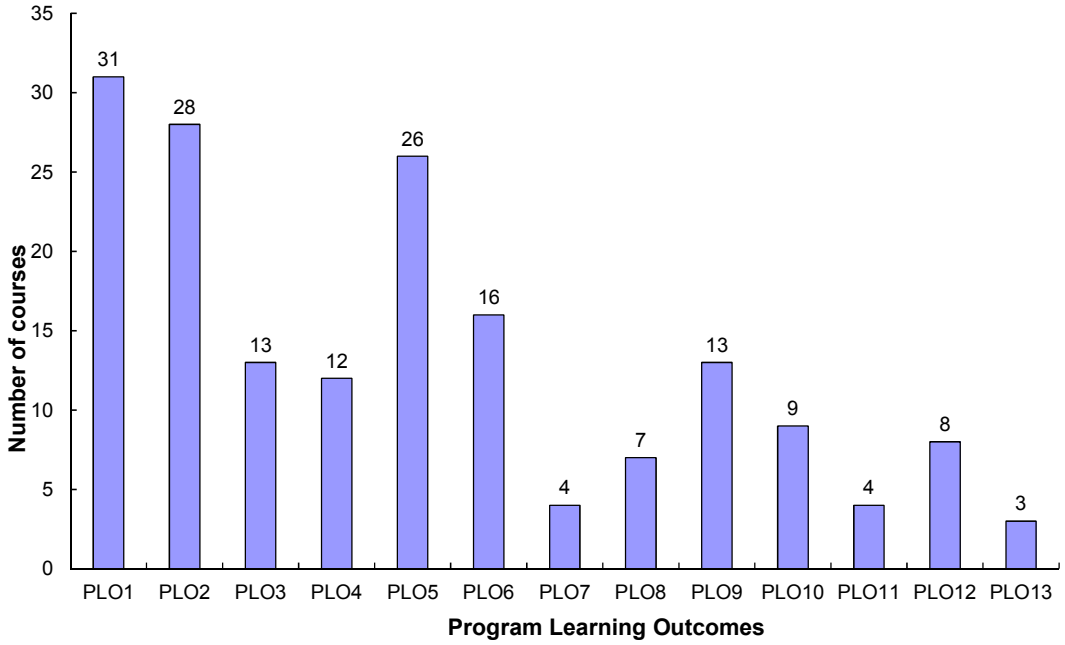


Fig. 1-1. Relationship of number of courses to PLO in BFF programme

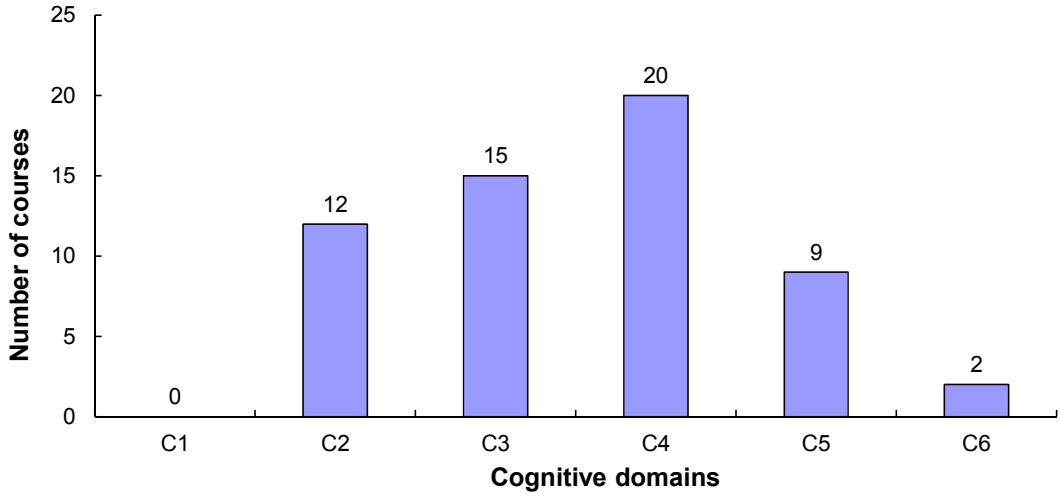


Fig. 1-2. Relationship of number of courses to levels in cognitive domain

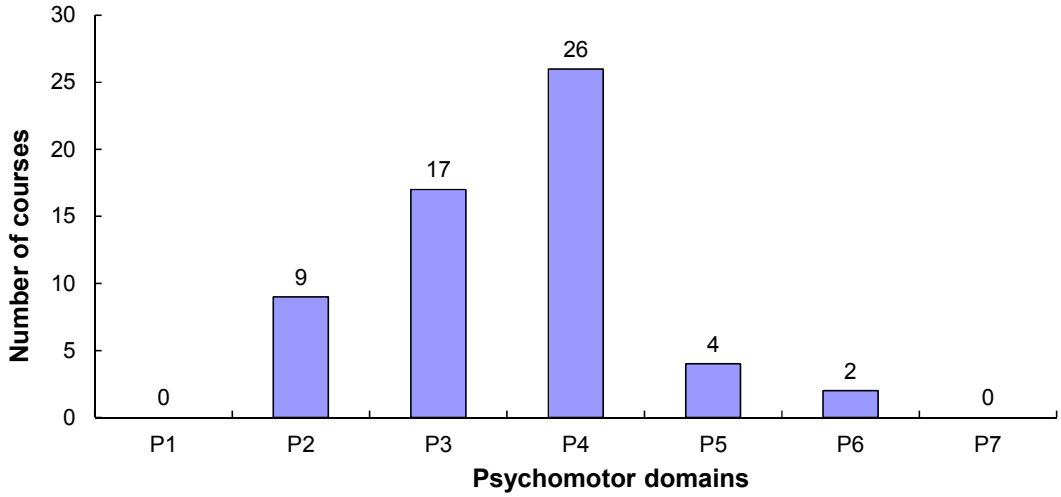


Fig. 1-3. Relationship of number of courses to levels in psychomotor domain

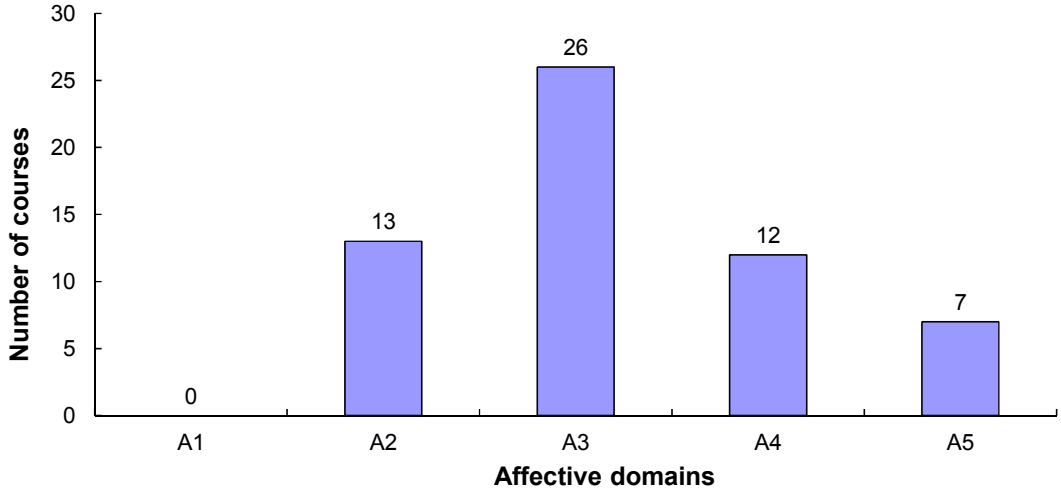


Fig. 1-4. Relationship of number of courses to levels in affective domain

2 ATTAINMENT OF PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

2.1 PEO Assessment Methodology

The attainment of PEO in graduates focuses on measuring FKAAS Alumni that have already graduated between 3 to 5 years. Measurements were also done on FKAAS Alumni that have already graduated under 3 years and over 5 years. FKAAS adopts a triangular-shaped PEO assessment methodology which comprised of two types of measurement namely indirect and direct measurements, as illustrated in Fig. 2-1. These two types of measurement targets two groups of respondents – the Employer and the Alumni. The assessment methods are: (1) Employer Survey (an indirect measurement); (2) Alumni Survey (an indirect measurement); and (3) Alumni Survey (a direct measurement). An indirect measurement refers to measurement based on the perception of respondent towards the Alumni, while a direct measurement refers to real or actual achievement of the Alumni. These measurements are performed once in every 2 to 3 years.

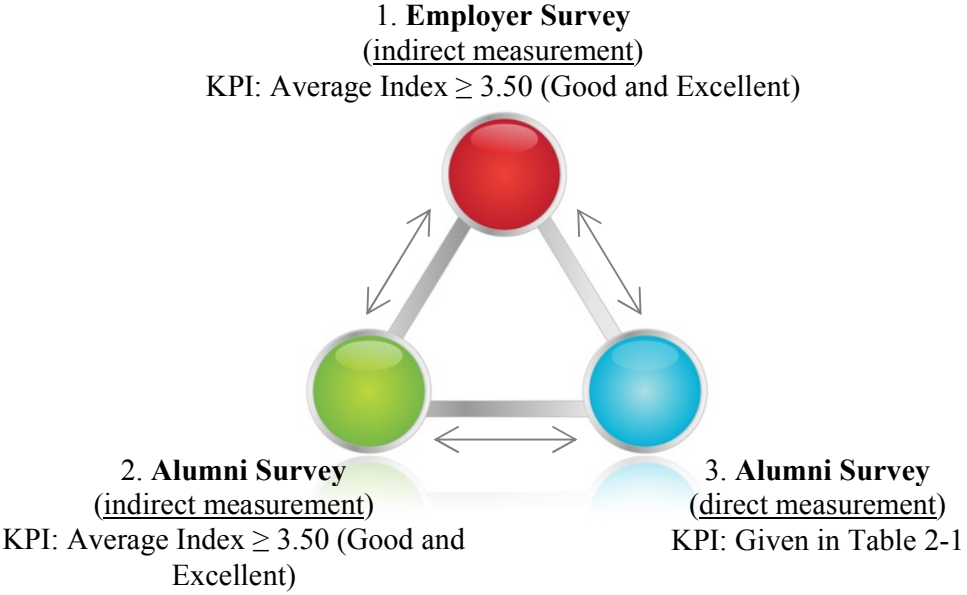


Fig. 2-1. PEO Assessment Methodology in FKAAS

2.2 PEO Achievement Key Performance Indicator

The Key Performance Indicators (KPI) for direct measurement PEO achievement are consistently reviewed with the recent most continuous quality improvement resulting in a better and more realistic success criteria as presented in Table 2-1. This direct measurement refers to the Alumni Survey explained in Fig. 2-1. For indirect measurement, the KPI of Employer Survey and the KPI of Alumni Survey is more than an Average Index of 3.50 indicating Good rating and above for every PEO. These KPI for indirect measurement are illustrated in Fig. 2-1.

2.3 PEO Assessment Questionnaire

Three methods of assessment for PEO have been described in the previous section as shown in Fig. 2-1, one for Employer (indirect measurement), and two for Alumni (indirect and direct measurement). Two sets of Questionnaire Survey, each for Employer and Alumni are presented in Appendix 2-1 and Appendix 2-2, respectively. The questions inside these surveys have been reviewed and improved thoroughly as a result of the many years of OBE practice in FKAAS. The tool used to disseminate the Questionnaire Survey is Google Form. This tool allows flexible and easy respondent access as well as easy and fast analysis on the part of OBE team in FKAAS.

In Employer Survey and Alumni Survey (part for indirect measurement), the respondents were asked to provide feedback on graduate attainment of the PEO's and their strength of their attributes contributed in the organisation on a Likert-scale of 1 (very poor) to 5 (excellent). Each category of PEO is supported by at least two other questions to improve the validity of the outcome. The rating of all responses were analysed and converted into percentage of the total respondents, hence the unit used in the following graphs is percentage. Subsequently, an average index rating is calculated to represent the assessed attribute. This average index rating is interpreted as 5 being excellent and 1 being very poor as given in Table 2-2.

Table 2-1. Direct measurement PEO achievement KPI

PEO	**KPI Success Criteria**
1 KNOWLEDGE; TECHNICALLY COMPETENT	Each of the following criteria to be satisfied for the fulfilment of this PEO: i. 50% of respondents have been promoted OR offered a better position. ii. 50% of respondent involved in research OR construction/design project proposal either as member or leader. iii. 2% of respondents are already Professional Engineer (PE). iv. 5% of respondents have published papers in conference/ journal OR written technical reports.
2 COMMUNICATION; LEADERSHIP	Each of the following criteria to be satisfied for the fulfilment of this PEO: i. 50% of respondent involved in research OR construction/design project proposal either as member or leader. ii. 5% of respondents have published papers in conference/ journal OR written technical reports. iii. 50% of respondents have held leadership positions for a taskforce OR project within an organization.
3 PROBLEM SOLVING	Each of the following criteria to be satisfied for the fulfilment of this PEO: i. 50% of respondents have been involved in construction/design projects. ii. 50% of respondents have been involved in research projects related to civil engineering.
4 ENTREPRENEURSHIP LIFE-LONG LEARNING	Each of the following criteria to be satisfied for the fulfillment of this PEO: i. 20% of respondents have been attending Professional Development Courses. ii. 5% of respondents furthering or have furthered their studies. iii. 5% of respondents have ventured into business (self-owned or partnership).

Table 2-2. Interpretation to average index (AI) rating

Average Index (AI)	Interpretation
4.5 to 5.0	Excellent
3.5 to 4.49	Good
2.5 to 3.49	Average
1.5 to 2.49	Poor
1.0 to 1.49	Very Poor

2.4 What the Employer says about UTHM Alumni? – Employer Survey 2017

From July to December 2017, an Employer Survey was sent out electronically to a total of 875 companies / contacts. A number of 261 sets of responses were received via the Google Form showing a response rate of about 30%. The respondents were Employers who rated their employees (Alumni) that have graduated from FKAAS UTHM. These Alumni who have graduated from FKAAS UTHM are sub-divided in accordance to the number of years that they have graduated from FKAAS UTHM. Out of 261 respondents, 92 assessed on Alumni who graduated less than 3 years; 103 assessed on Alumni who graduated 3 to 5 years; 43 assessed on Alumni who graduated 6 to 10 years; and 23 assessed on Alumni who graduated more than 10 years.

Of the 103 respondents corresponding to Alumni who graduated 3 to 5 years, it is observed that the majority (38%) of Alumni works in Contractor firms followed by Government related agencies (19%) and Consultant firms (16%). This is presented in **Fig. 2-1**Fig. 2-2. Similar pattern is found in Alumni who graduated in different period of years. This is not conclusive because the sampling ratio is deemed as very small. Nevertheless it does give an indication that majority of the Alumni are working in Contractor firms.

A total of 20 questions have been given to the Employer (Appendix 2-1) to assess the Alumni. The 20 questions have been designed such that they are grouped to assess each of the 4 PEO. The overall summary attainment of PEO for Alumni graduated 3 to 5 years resulting from the Employer Survey is given in Fig. 2-3.

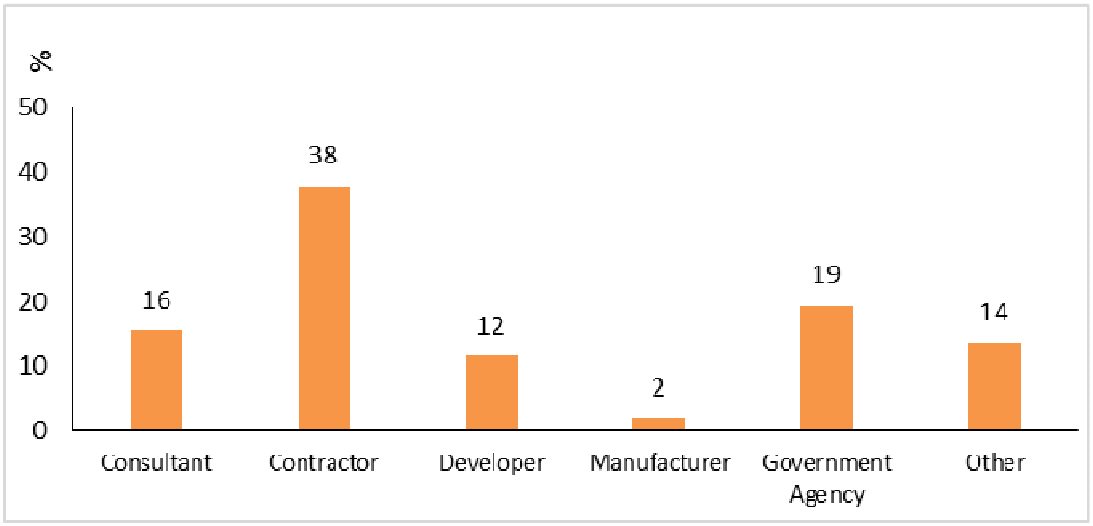


Fig. 2-2. Percentages of Alumni who graduated 3 to 5 years working in different type of firms

Based on Fig. 2-3, it is evidential that PEO 1, PEO 2, PEO 3, PEO 4 have achieved its KPI criteria of AI 3.50 with each reading AI of 4.07, 4.01, 4.30, 4.20, respectively.

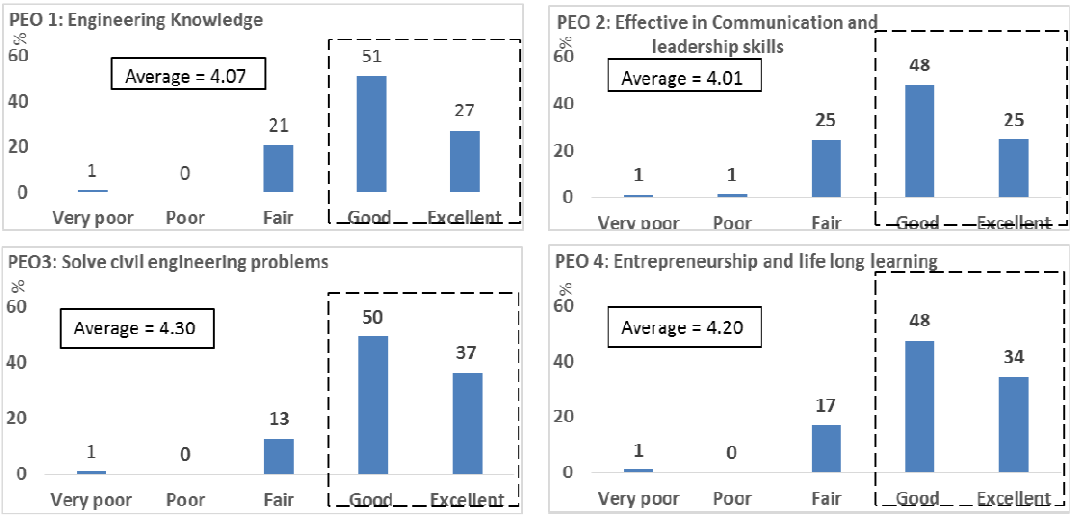


Fig. 2-3. Employer Survey indirect measurement on Alumni with 3 to 5 years of working experience – one's perception on the attainment of PEO 1, PEO 2, PEO 3, PEO 4

Detailed breakdown characteristics for each PEO relating to the questions asked have been reviewed and analysed in order to find the strength areas or areas which require further improvement (Fig. 2-4 and Fig. 2-5).

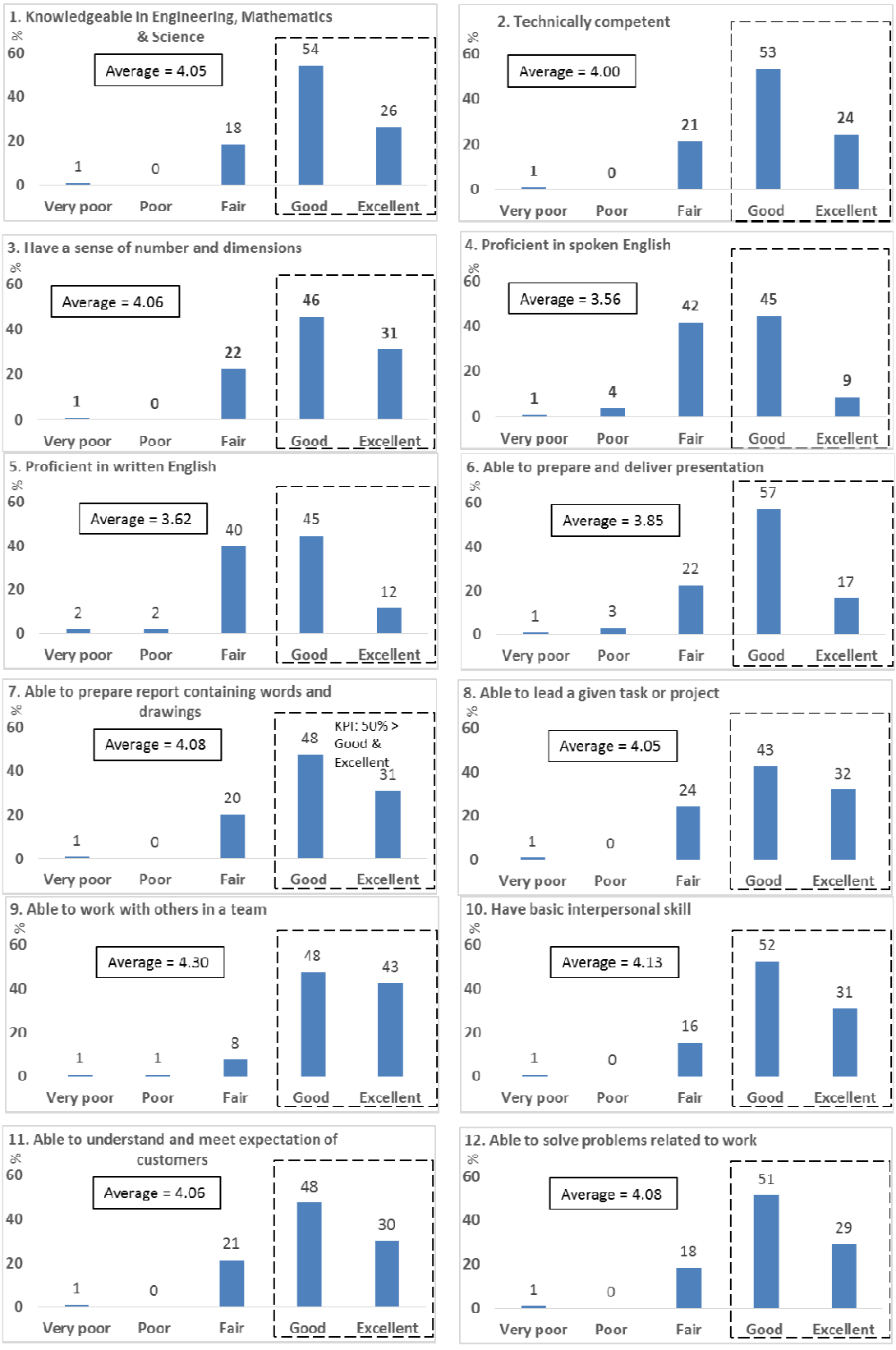


Fig. 2-4. Employer Survey indirect measurement on Alumni with 3 to 5 years of working experience – breakdown characteristics (Q1 to Q12) for all PEO

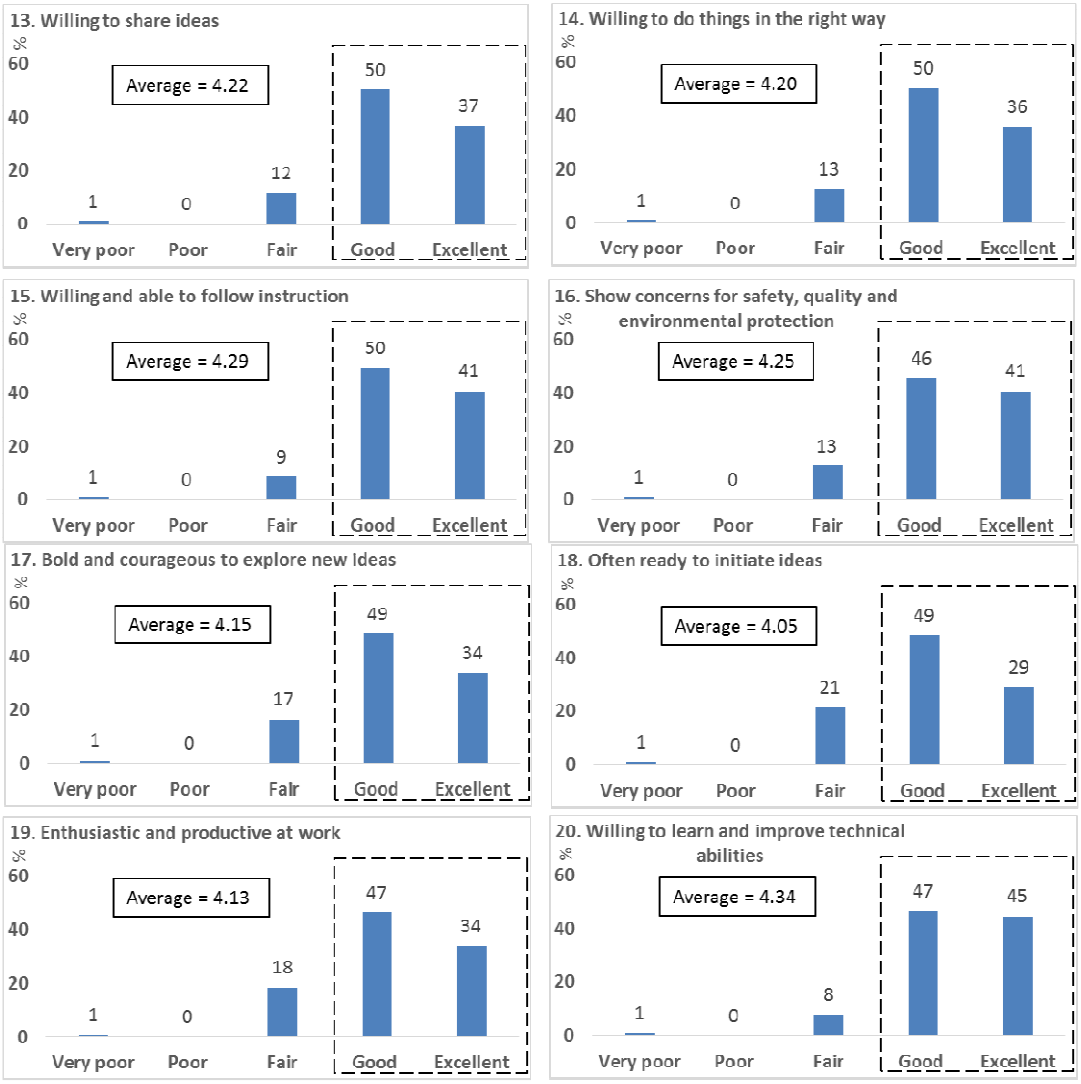


Fig. 2-5. Employer Survey indirect measurement on Alumni with 3 to 5 years of working experience – breakdown characteristics (Q13 to Q20) for all PEO

Based on the breakdown characteristic analysis of the Employer Survey, the areas of strength and areas to be improved have been identified as presented in Table 2-3. These areas are interpreted as perception of the Employer towards the Alumni. Areas of strength are taken as characteristics with Average Index, AI greater than 4.20; and areas to be improved as characteristics with Average Index, AI less than 4.00.

Table 2-3. Perception of Employer towards Alumni graduated after 3 to 5 years

Areas of Strength (AI ≥ 4.20)	Areas To Be Improved (AI < 4.00)
1. Willing to learn and improve technical abilities (4.34) [PEO 4]	1. Proficient in spoken English (3.56) [PEO 2]
2. Able to work with others in team (4.30) [PEO2]	2. Proficient in written English (3.62) [PEO2]
3. Willing and able to follow instruction (4.29) [PEO 3]	3. Able to prepare and deliver presentation (3.85) [PEO 2]
4. Shows concern for safety, quality and environmental protection (4.25) [PEO 3]	
5. Willing to do things in the right way (4.20) [PEO 3]	
6. Willing to share ideas (4.22) [PEO 3]	

2.5 What the Alumni perceive of themselves? – Alumni Survey 2017

Alumni Survey consists of two parts: indirect and direct measurements of PEO attainment. The survey was performed from July 2017 to December 2017. Google Form questionnaires were sent to a total number of 2000 email addresses who are UTHM Alumni from year 2005 to 2016. From the 2000 emails sent, only 643 recipients responded showing a 32% response rate. The analysis of the survey were divided into three categories of respondents, which are based on their working experience of (1) less than 3 years – 220 respondents; (2) 3 to 5 years – 187 respondents and (3) more than 5 years – 236 respondents. For the purpose of reporting, only results of (2) 3 to 5 years are presented.

The indirect measurement of the survey is based on self-evaluation or self-perception of the Alumni on the attainment of PEO within oneself. In the direct measurement survey, the attainment of PEO is evaluated based on 3 criteria:

i. Employment history since graduated;

ii. Actual or real professional achievement and contribution; and

iii. Features of professional development and entrepreneurship.

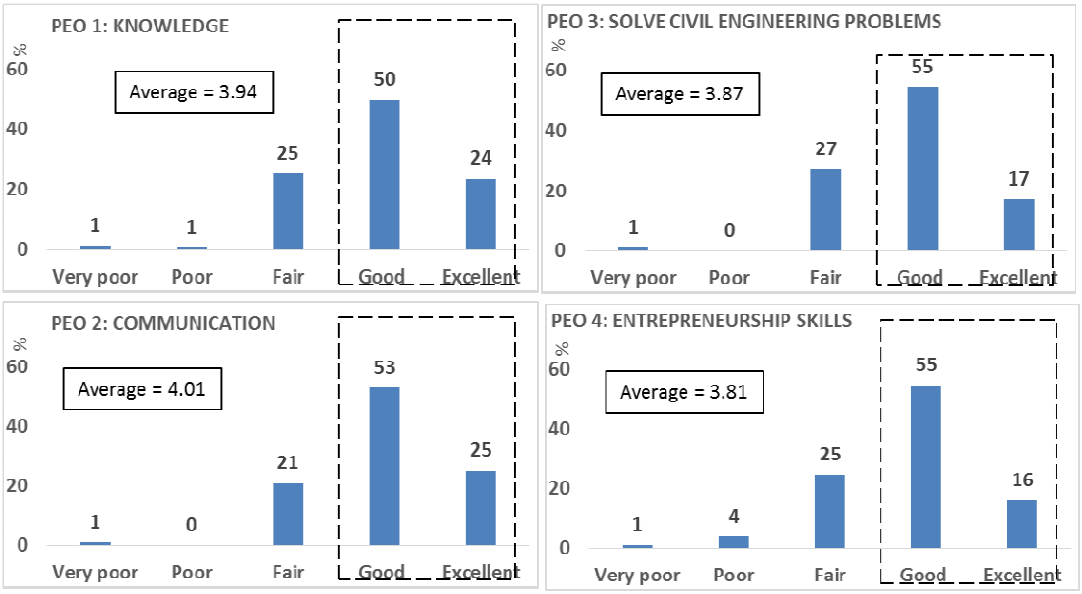


Fig. 2-6. Alumni Survey indirect measurement on alumni with 3 to 5 years of working experience – one's perception on the attainment of PEO 1, PEO 2, PEO 3, PEO 4

Fig. 2-6 shows the summary analysis of all the PEO attainment for alumni who have working experiences of 3 to 5 years. The analysis shows that the attainment for all the PEO are above the KPI criteria of Average Index (AI) 3.50, for PEO 1 AI = 3.94; PEO 2 AI = 4.01; PEO 3 AI = 3.87; and PEO 4 AI = 3.81.

2.6 Alumni's real achievements through direct measurement

The direct survey on alumni's attainment on all the PEO was evaluated by measuring their actual involvement in the organization based on their employment history since their graduation, their professional achievement and contribution, and their professional development. Table 2-4 to Table 2-7 show a summary analysis of Alumni Survey direct measurement for PEO 1 to PEO 4, respectively. The attainment of each PEO was found to have satisfied the KPI success criteria outlined in Table 2-1.

Table 2-4. Alumni Survey direct measurement for PEO 1 – Knowledge, Technically Competent

Direct measurement question	**Percentage answering**		**KPI**
	Yes	**No**	
Have been promoted or offered to a better position	66	34	50% KPI achieved
Have been involved in research/construction project proposal either as member or leader	61	39	50% KPI achieved
Are you a Professional Engineer (PE)	3	97	2% KPI achieved
Have published papers in conference/journal	14	86	5% KPI achieved

Table 2-5. Alumni Survey direct measurement for PEO 2 – Communication, Leadership

Direct measurement question	**Percentage answering**		**KPI**
	Yes	**No**	
Have been involved in research/construction project proposal either as member or leader	61	39	50% KPI achieved
Have published papers in conference/journal	14	86	5% KPI achieved
Have held leadership positions for a taskforce or project within an organization	57	43	50% KPI achieved

Table 2-6. Alumni Survey direct measurement for PEO 3 – Problem Solving

Direct measurement question	**Percentage answering**		**KPI**
	Yes	**No**	
Have been involved in civil engineering design/construction projects	74	26	50% KPI achieved
Have been involved in research and/or development projects related to civil engineering	50	50	50% KPI achieved

Table 2-7. Alumni Survey direct measurement for PEO 4 – Entrepreneurship, Life long learning

Direct measurement question	**Percentage answering**		**KPI**
	Yes	**No**	
Have been attending Continuous Professional Development courses	33	67	20% KPI achieved
Have furthered studies to a higher degree	18	82	5% KPI achieved
Have ventured into business (self-owned or partnership)	25	75	5% KPI achieved

2.7 Summary on PEO attainment

On the basis of PEO assessments performed in 2017: Employer Survey (indirect measurement) and Alumni Survey (direct and indirect measurement), analysis have found that all PEO 1 to PEO 4 have attained the pre-determined goals or KPI.

3 ATTAINMENT OF PROGRAMME LEARNING OUTCOMES (PLO)

3.1 PLO Assessment Methodology

Similar to PEO assessment methodology, the assessment method for PLO also applies to a triangular-shaped concept as shown in Fig. **3-1** which includes (1) Course Learning Outcome versus Programme Learning Outcome (CLO-PLO) Assessment; (2) Fundamental Civil Engineering Exam (FCEE); and (3) Exit Survey. The achievement of each PLO is considered as attained when all the three above mentioned assessment methods satisfy an average marks of not less than 55%.

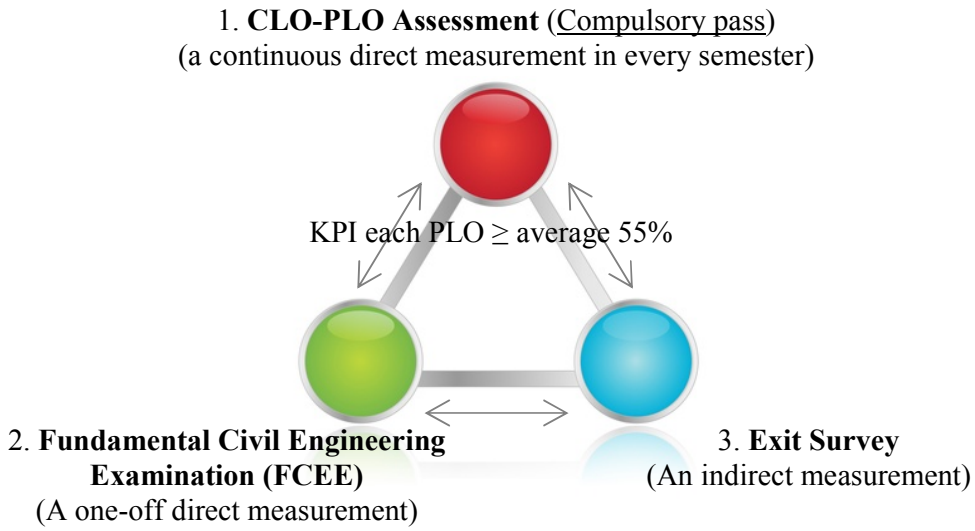


Fig. 3-1. PLO assessment methodology in FKAAS

3.2 Course Learning Outcome versus Programme Learning Outcome (CLO-PLO) Assessment

CLO-PLO assessment is performed all through the semester within every course. For every course, there are 3 CLO mapped one PLO each for domain Cognitive (C), Psychomotor (P) and Affective (A), respectively. Table 3-1 provides a typical sample of assessment tool and marks distribution for CLO.

Table 3-1. Typical assessment tool and marks distribution for CLO

CLO	PLO	Domain	Assessment Tool	Marks (%)
1	1st PLO	Cognitive	Quizzes	5
			Assignments	5
			Tests	20
			Project	5
			Exam	50
2	2nd PLO	Psychomotor	Project	7.5
3	3rd PLO	Affective	Project	7.5
			Total	100

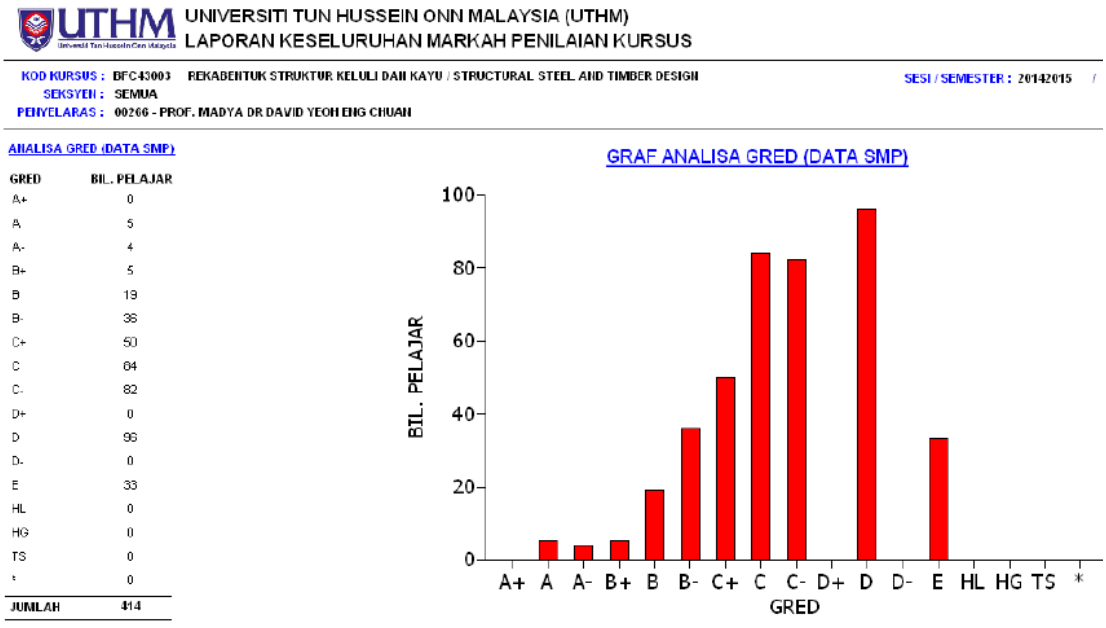


Fig. 3-2. Typical Assessment of marks for a course

The CLO-PLO results for each course are automatically generated by a university centralised system known as Total Campus Integrated System (TCIS). Statistical distribution in tabulated and graph formats are given as shown in Fig. 3-2 for course marks overall report and Fig. 3-3 for course OBE overall report.

UNIVERSITI TUN HUSSEIN ONN MALAYSIA (UTHM)
LAPORAN KESELURUHAN OUTCOME BASED EDUCATION (OBE)

KOD KURSUS : BFC43003 REKABENTUK STRUKTUR KELULI DAN KAYU / STRUCTURAL STEEL AND TIMBER DESIGN SESI / SEMESTER : 201420
SEKSYEN : SEMUA
PENYELARAS : 00266 - PROF. MADYA DR DAVID YEOH ENG CHUAN

STATISTIK PURATA PENCAPAIAN CLO DAN PLO

				CLO 1	CLO 2	CLO 3
Sesi/Semester	Kursus	Seksyen	Pilihan OBE	PLO 04 (CTPS)	PLO 02 (P)	PLO 03 (CS)
20142015/1	BFC43003	1	1	41.29	84.44	84.26
		2	1	46.02	83.47	75.75
		3	1	41.48	76.63	86.67
		4	1	38.59	76.78	84.63
		5	1	46.62	83.08	93.60
		6	1	44.65	75.45	85.33
		7	1	43.97	82.15	89.78
20142015/1 Total				**43.23**	**80.29**	**85.72**
Grand Total				**43.23**	**80.29**	**85.72**

GRAF PURATA PENCAPAIAN CLO

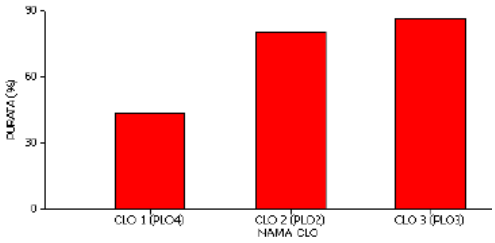


Fig. 3-3. Typical OBE Overall Report for a course

The CLO-PLO achievement for 2 semesters of each year 2016, 2017 and 2018 are presented in Fig. 3-4, Fig. 3-5, and Fig. 3-6, respectively. The first success criterion / KPI for each PLO attainment is that the average mark of the courses addressing the PLO is at least 55%. The second success criterion / KPI used to measure the achievement of PLO is at least 50% of students within each cohort / section achieve 55% marks as illustrated in Fig. 3-7 for a single course. This latter success criterion focuses on the student numbers while the former success criterion focuses on the PLO marks.

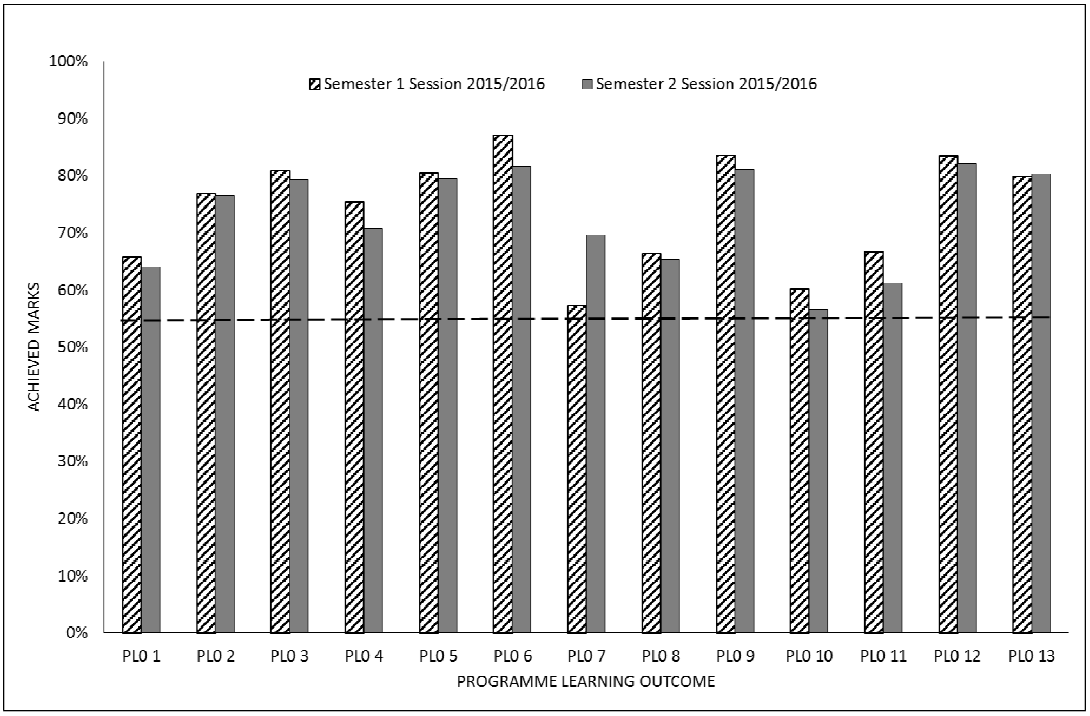


Fig. 3-4. CLO-PLO achievement for BFF programme in Semester 1 and Semester 2 Session 2015/2016

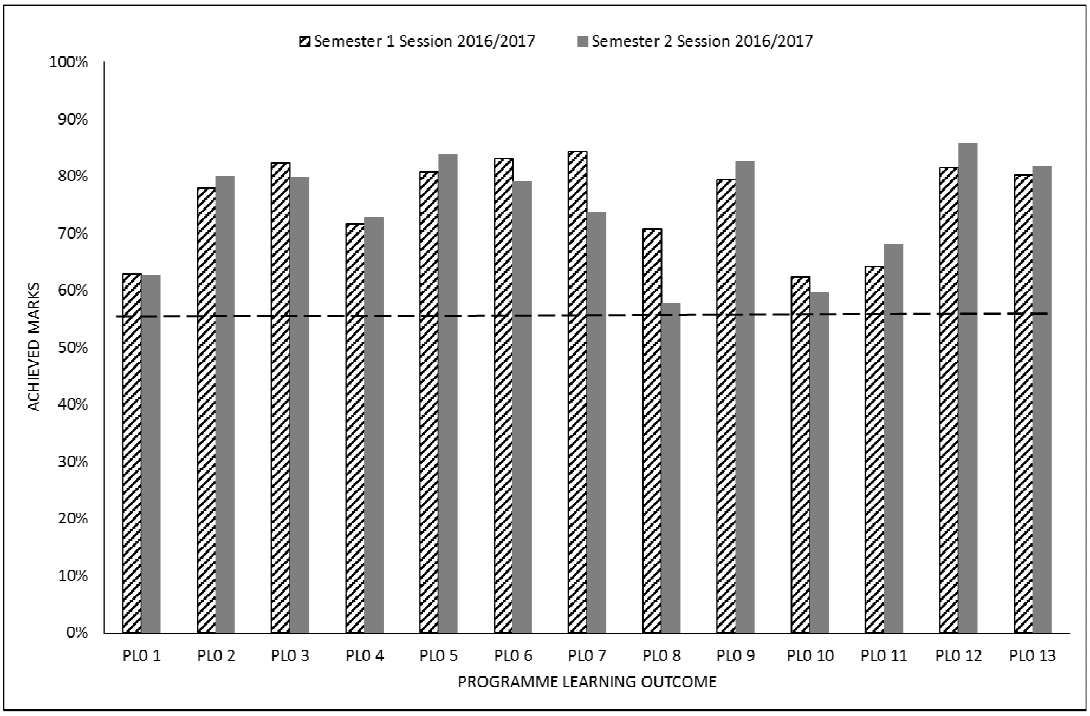


Fig. 3-5. CLO-PLO achievement for BFF programme in Semester 1 and Semester 2 Session 2016/2017

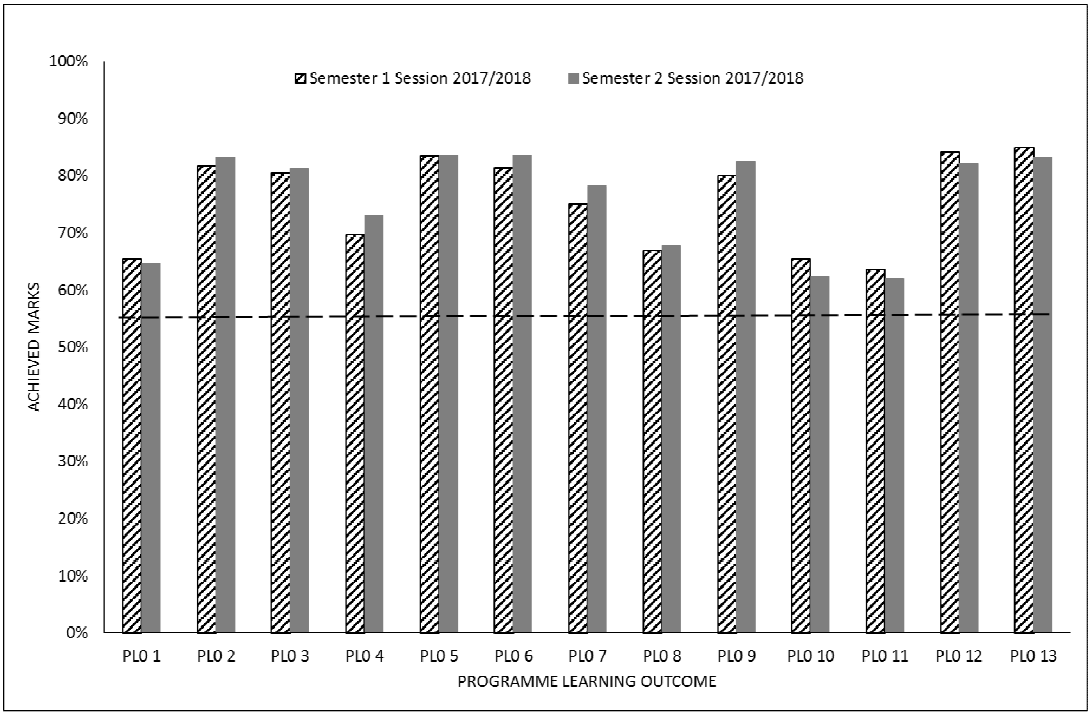


Fig. 3-6. CLO-PLO achievement for BFF programme in Semester 1 and Semester 2 Session 2017/2018

UNIVERSITI TUN HUSSEIN ONN MALAYSIA (UTHM)
Overall CLOs Achievement Report

Course Code : BFC43003 REKABENTUK STRUKTUR KELULI DAN KAYU / STRUCTURAL STEEL AND TIMBER DESIGN
Section : SEMUA
Coordinator : 00266 - PROF. MADYA DR DAVID YEOH ENG CHUAN
Session / Sem : 20152016 / 1

Overall CLOs ACHIEVEMENT REPORT (Previous)

Session: 20142015 / 1
Course Code: BFC43003

OBE Option	CLOs	PLOs	KPI		Achieved KPI		Remarks
			% Students	% Marks	No. Students	% Students	
1	CLO 1	PLO 04 (CTPS	50	55	46 / 335	13.73	Not Achieved
2	CLO 1	PLO 10 (DS)	50	55	14 / 79	17.72	Not Achieved
1	CLO 2	PLO 02 (P)	50	55	307 / 335	91.64	Achieved
2	CLO 2	PLO 09 (LS)	50	55	65 / 79	82.28	Achieved
1	CLO 3	PLO 03 (CS)	50	55	332 / 335	99.10	Achieved
2	CLO 3	PLO 05 (TS)	50	55	79 / 79	100.00	Achieved

Overall CLOs ACHIEVEMENT REPORT (Current)

Session: 20152016 / 1
Course Code: BFC43003

OBE Option	CLOs	PLOs	KPI		Achieved KPI		Remarks
			% Students	% Marks	No. Students	% Students	
1	CLO 1	PLO 04 (CTPS	50	55	2 / 12	16.67	Not Achieved
2	CLO 1	PLO 10 (DS)	50	55	117 / 310	37.74	Not Achieved
1	CLO 2	PLO 02 (P)	50	55	11 / 12	91.67	Achieved
2	CLO 2	PLO 09 (LS)	50	55	287 / 310	92.58	Achieved
1	CLO 3	PLO 03 (CS)	50	55	11 / 12	91.67	Achieved
2	CLO 3	PLO 05 (TS)	50	55	309 / 310	99.68	Achieved

STATISTIK BILANGAN PELAJAR MENDAFTAR KURSUS

Sesi	Sem	Kod Kursus	Seksyen	Program	DT	UK	Jumlah
20142015	1	BFC43003	1	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	63	1	64
			2	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	58	2	60
			3	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	62	1	63
			4	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	51		51
			5	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	48		48
			6	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	62		62
			7	BFF - SARJANA MUDA KEJURUTERAAN AWAM DENGAN KEPUJIAN	65	1	66
Jumlah Besar					409	5	414

Fig. 3-7. Typical example of CLO-PLO assessment with KPI focus on student numbers

3.3 Fundamental Civil Engineering Exam (FCEE)

The Fundamental Civil Engineering Exam (FCEE) is a one-off direct measure of final year students' understanding on the fundamental of civil engineering disciplines. FCEE is one of the three tools used to measure students' achievement on the Learning Outcomes (PLO) of Bachelor of Civil Engineering with Honours (see Fig. **3-1**). Beginning year 2016, resulting from feedbacks and lessons from Benchmark Visits to other universities, External Examiner, and Stakeholders' Symposium, two significant improvements have been made: (1) FCEE focus on assessing only the Cognitive Domain PLO because it is a written exam oriented assessment; and (2) New questions for two sets of FCEE papers which covers the four PLO that are categorised as Cognitive Domain PLO, namely PLO 1 for Engineering Knowledge; PLO 4 for Critical Thinking and Problem Solving; PLO 10 for Design / Development of Solutions; and PLO 11 for Problem Analysis.

The date of the FCEE and the number of candidates for year 2016, 2017 and 2018 are shown in Table 3-2

Table 3-2. FCEE date and number of candidates in 2016, 2017 and 2018

Year	Semester, Session	Date of FCEE	Number of Student	Total
2016	Semester I, Session 2015/2016	26 Nov. 2015	157	535
	Semester II, Session 2015/2016	5 May 2016	378	
2017	Semester I, Session 2016/2017	24 Nov. 2016	80	478
	Semester II, Session 2016/2017	20 April 2017	398	
*2018	Semester I, Session 2017/2018	23 Nov. 2017	113	324
	Semester II, Session 2017/2018	2 – 10 May 2018	211	

Note: * conducted by Google Form online

In 2016 and 2017, FCEE is a paper-based examination, to be completed in 2 hours. Beginning Semester I Session 2017/2018 FCEE was conducted online, to be completed in 2 hours. The FCEE format is the same for paper-based and online. It consists of 40 multiple-choice questions, to be completed in 2 hours. The FCEE constitutes 20% of the grade in the Integrated Design Project course. Different set of FCEE is administered each academic year. The paper covers most of the Civil Engineering courses, including Construction Management, Structure and Materials, Highway and Traffic, Geotechnical, Environmental, Hydraulics and Hydrology, and Surveying. Table 3-3 lists the breakdown of the questions according to the varying courses covered in the FCEE.

Table 3-3. Number of questions according to subjects in the new format of FCEE paper

Subjects	Number of Questions
Water Resources & Environmental Engineering	10
Structure & Materials Engineering	10
Survey, Geotechnical Engineering, Traffic & Highway Engineering	10
Construction Engineering & Sustainable Management	10
To tal	40

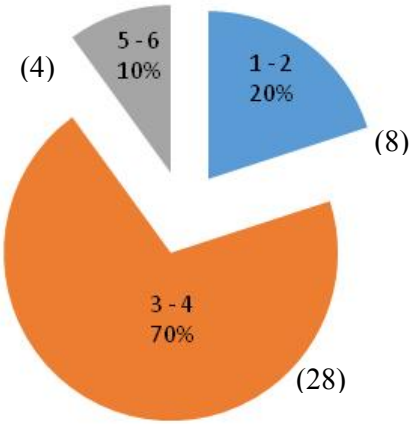


Fig. 3-8. Typical of FCEE questions ( ) follows the taxonomy level

Each PLO has 10 questions and out of the 40 questions, 20% (8 questions) have the taxonomy levels 1 & 2, 70% (28 questions) in taxonomy levels 3 & 4, and 10% (4 questions) in taxonomy levels of 5 and higher. Fig. 3-8 shows the distribution of the

FCEE questions follows the taxonomy level. A dominant of 70% of the FCEE questions were designed in taxonomy level 3 & 4 because these levels correspond to graduates of Bachelor of Civil Engineering with Honours that should be able to apply the knowledge of mathematics, natural science, engineering fundamentals and civil engineering specialization to solve complex civil engineering problems.

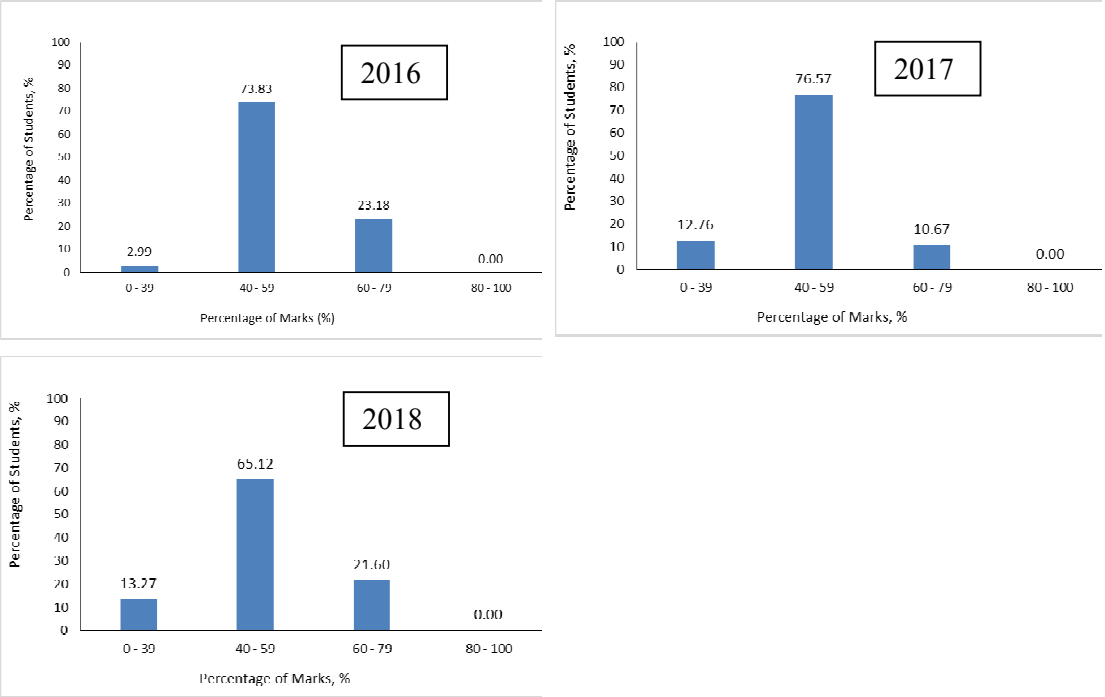


Fig. 3-9. FCEE marks achievement for year 2016, 2017, and 2018

The average of the students' achievement in FCEE for 2016, 2017 and 2018 are shown in Fig. 3-9. The result is based on the average of achievement in both semesters by considering the number of students in each semester. Overall, most students score in the range of 40% - 59%.

The overall PLO achievement in 2016, 2017 and 2018 is shown in Fig. 3-10. The result is based on the average of achievement in both semesters by considering the number of students in each semester. Table 3-4 shows the comparison of PLO attainment for 2016, 2017 and 2018. Overall, the achievement for the last FCEE (2018) was slightly increased from 2016 to 2018. The achievement of PLO 4 and PLO 10 is quite consistent for the last three FCEE (2016, 2017 and 2018). However, the achievement of PLO 1 and PLO 10

was slightly decreased from 2016 to 2018. The use of online assessment (2018) does not show significant changes in the achievement of the PLO.

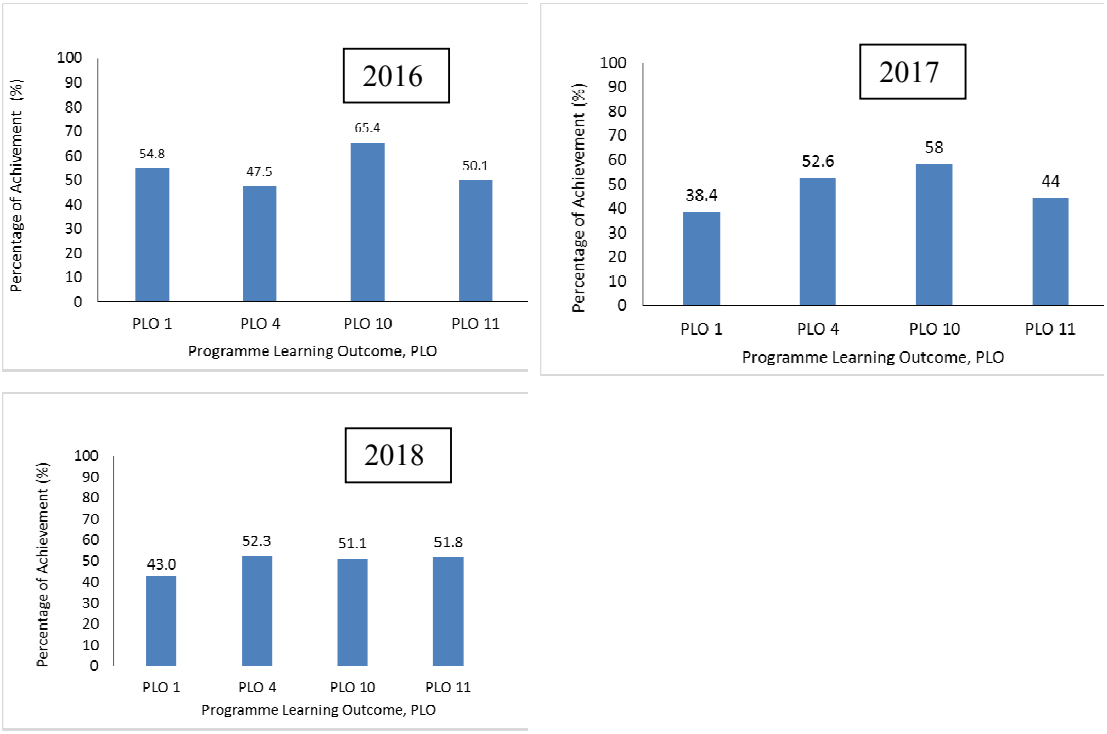


Fig. 3-10. FCEE PLO achievement for year 2016, 2017, and 2018

Table 3-4. Summary of PLO attainment in FCEE for year 2016, 2017, and 2018

PLO	Achievement (%)		
	2016	2017	2018
1	54.8	38.4	43.0
4	47.5	52.6	52.3
10	65.4	58.0	51.1
11	50.1	44.0	51.8

The following are activities recommended to improve students' performance in the upcoming FCEE:

1. Student briefing on FCEE should be carried out by the coordinator during the first meeting of Integrated Design Project course to ensure that the students are well prepared for the exam;

2. The FCEE questions should be reviewed by professional engineer or adjunct professor to increase its quality and suitability; and

3. More sets of questions should be prepared to increase the reserve of questions, as a different set of FCEE questions is used each semester.

3.4 Exit Survey

Exit Survey is an indirect measurement of self-assessment of the PLO based on individual perception as presented in Appendix 3-1. The main objectives of the survey are (1) To determine students' perception on the achievement of PLO in oneself; (2) To determine students' perception on their achievement of soft-skills attributes listed within the PLO; and (3) To evaluate students' satisfaction level towards learning and teaching aspects, academic management, and university facilities. The tool used to perform this survey is Google Form. This survey is normally completed by all graduating students during their convocation.

Three Exit Survey were conducted for year 2016, 2017 and 2018, each in the month of October of the respective year. The respondents for each year survey are the graduating students of the respective year. The statistics of graduates for year 2016, 2017 and 2018 is shown in Table 3-5.

Table 3-5. Statistic of graduates for year 2016, 2017, and 2018

Year	2016	2017	2018
Number of graduates	454	414	401
Male percentage	46	47	48
Female percentage	54	53	52

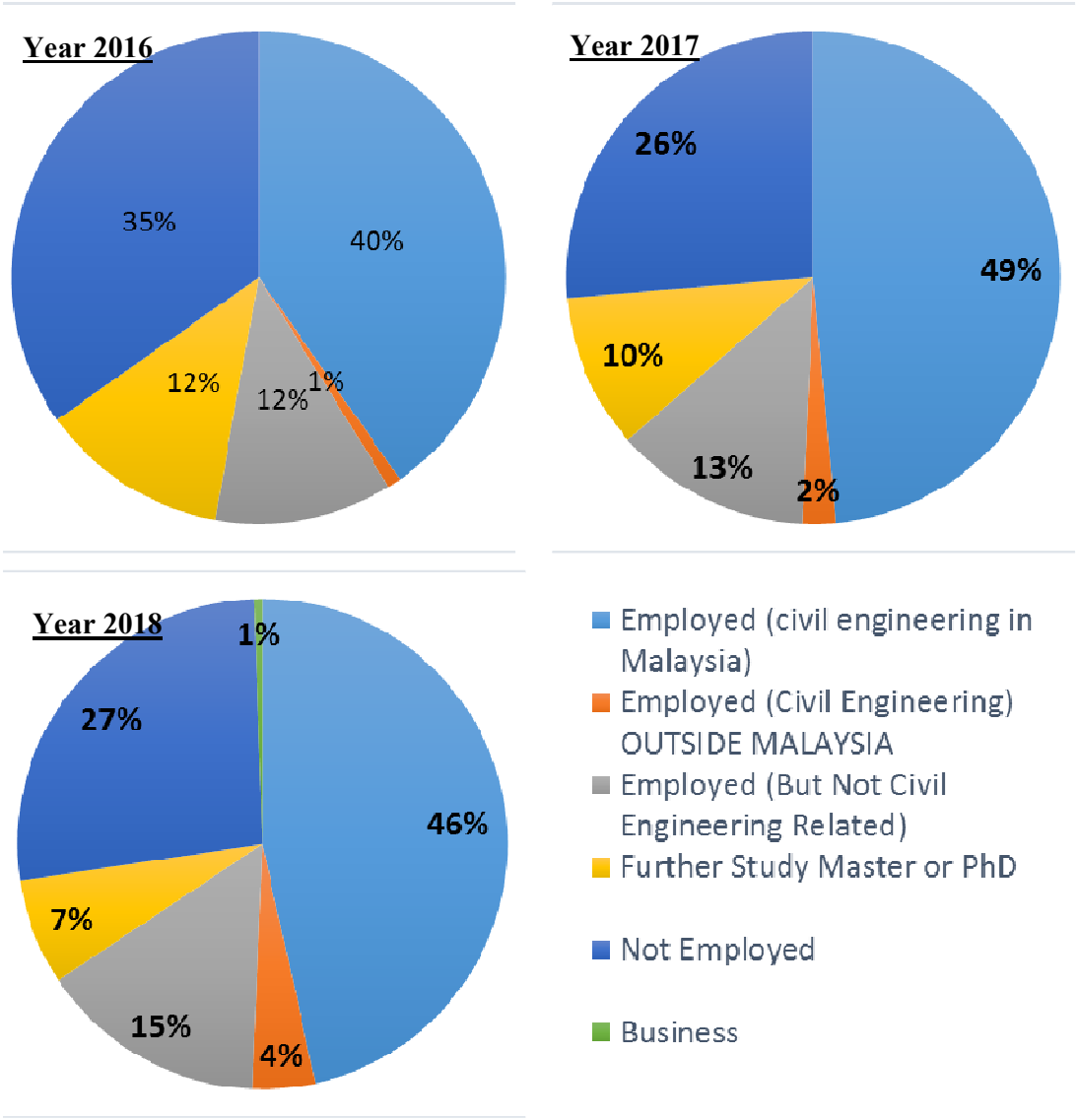


Fig. 3-11. Employment statistics of graduates 4 months after final semester exam for year 2016, 2017, 2018

The Exit Survey for the 3 years also showed that on average 45% of FKAAS graduates, within 4 months after their final semester examination have been offered employment in the Civil Engineering industry within Malaysia while up to 4% (in year 2018) have been employed in Singapore in the Civil Engineering industry in that country. This percentage is not inclusive of those who have employment outside Civil Engineering industry and those who decided to continue their education in postgraduate studies. Detailed statistics are given in Fig. 3-11.

In gauging the PLO attainment, respondents were asked to evaluate themselves on a scale of 1 (very poor) to 5 (excellent) according to level of attainment. Table 3-6 shows the summary of PLO achievement where graduating students perceived their own PLO attainment at a level of good (scale 4) or excellent (scale 5) score.

Table 3-6. Exit Survey PLO achievement – % of students responded good (scale 4) or excellent (scale 5) score for year 2016 and 2017

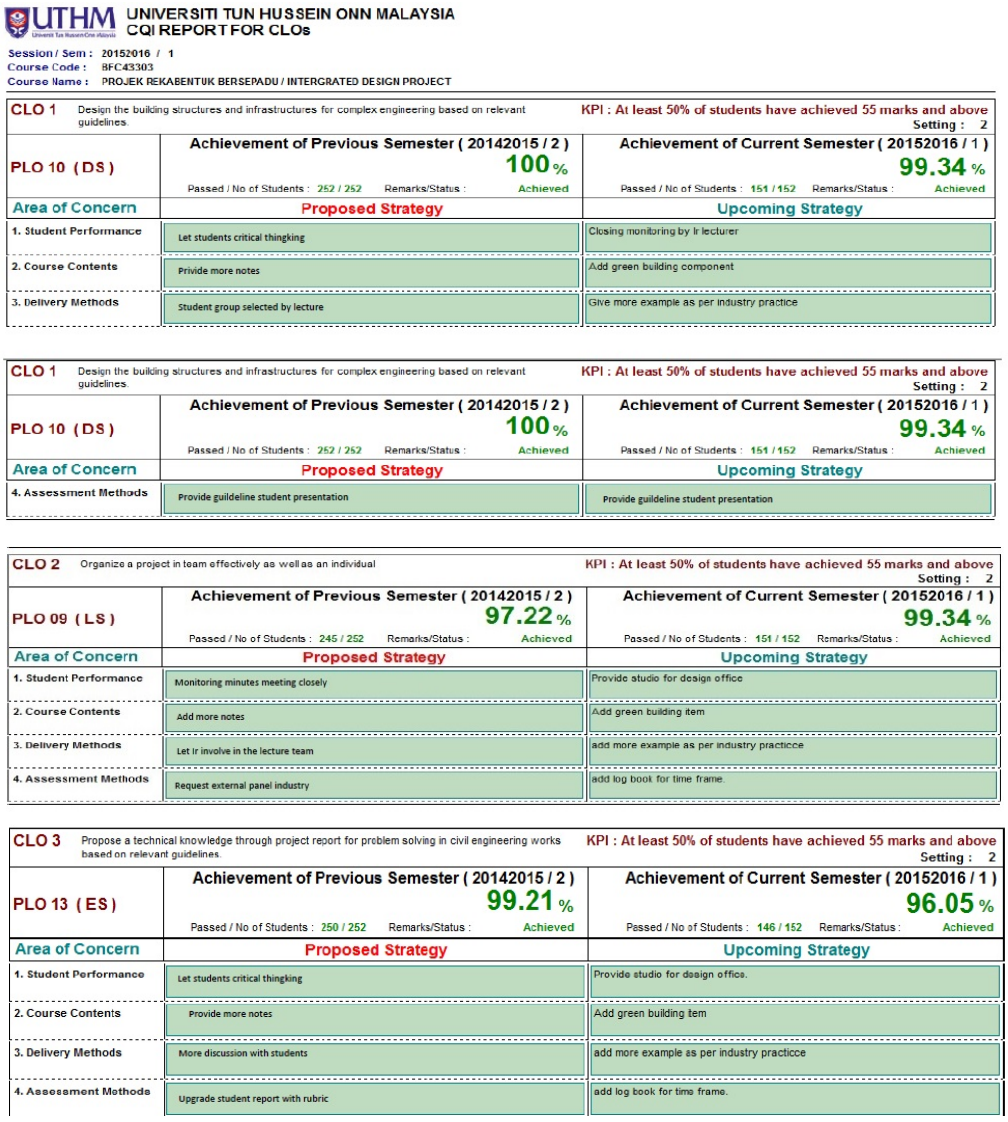
PLO	Taxonomy	Year 2016	Year 2017	Year 2018
1 K	C	74	79	
2 PS	P	72	78	
3 CS	P	71	80	
4 CTPS	C	71	78	
5 TW	A	80	83	
6 LL	A	78	81	
7 ES	P	80	81	
8 ET	A	83	85	
9 LS	P	78	82	
10 DDS	C	69	74	
11 PA	C	69	71	
12 ESus	A	81	83	
13 ESoc	A	77	82	

Note: C is Cognitive, P is Psychomotor, and A is Affective

A clear lesson from the data in Table 3-6 shows that in general, many graduating students perceived themselves to have lower command of the Cognitive PLO but stronger command of the Psychomotor and Affective PLO.

3.5 Continuous Quality Improvement (CQI) Efforts

In order to improve CLO within the teaching learning of a particular course, various strategies can be proposed by the lecturer for the different area of concern. This is generated in a format known as CQI Report for CLO as shown in Fig. 3-12. The proposed strategy for improvement is suggested and passed onto the next lecturer automatically via a course management system.



UNIVERSITI TUN HUSSEIN ONN MALAYSIA
CQI REPORT FOR CLOs

Session / Sem : 20152016 / 1
Course Code : BFC43303
Course Name : PROJEK REKABENTUK BERSEPADU / INTERGRATED DESIGN PROJECT

CLO 1	Design the building structures and infrastructures for complex engineering based on relevant guidelines.	KPI : At least 50% of students have achieved 55 marks and above. Setting : 2
PLO 10 (DS)	Achievement of Previous Semester (20142015 / 2) 100 % Passed / No of Students : 252 / 252 Remarks/Status : Achieved	Achievement of Current Semester (20152016 / 1) 99.34 % Passed / No of Students : 151 / 152 Remarks/Status : Achieved
Area of Concern	Proposed Strategy	Upcoming Strategy
1. Student Performance	Let students critical thingking	Closing monitoring by lr lecturer
2. Course Contents	Privide more notes	Add green building component
3. Delivery Methods	Student group selected by lecture	Give more example as per industry practice

CLO 1	Design the building structures and infrastructures for complex engineering based on relevant guidelines.	KPI : At least 50% of students have achieved 55 marks and above. Setting : 2
PLO 10 (DS)	Achievement of Previous Semester (20142015 / 2) 100 % Passed / No of Students : 252 / 252 Remarks/Status : Achieved	Achievement of Current Semester (20152016 / 1) 99.34 % Passed / No of Students : 151 / 152 Remarks/Status : Achieved
Area of Concern	Proposed Strategy	Upcoming Strategy
4. Assessment Methods	Provide guildeline student presentation	Provide guildeline student presentation

CLO 2	Organize a project in team effectively as well as an individual	KPI : At least 50% of students have achieved 55 marks and above. Setting : 2
PLO 09 (LS)	Achievement of Previous Semester (20142015 / 2) 97.22 % Passed / No of Students : 245 / 252 Remarks/Status : Achieved	Achievement of Current Semester (20152016 / 1) 99.34 % Passed / No of Students : 151 / 152 Remarks/Status : Achieved
Area of Concern	Proposed Strategy	Upcoming Strategy
1. Student Performance	Monitoring minutes meeting closely	Provide studio for design office
2. Course Contents	Add more notes	Add green building item
3. Delivery Methods	Let lr involve in the lecture team	add more example as per industry practicce
4. Assessment Methods	Request external panel industry	add log book for time frame.

CLO 3	Propose a technical knowledge through project report for problem solving in civil engineering works based on relevant guidelines.	KPI : At least 50% of students have achieved 55 marks and above. Setting : 2
PLO 13 (ES)	Achievement of Previous Semester (20142015 / 2) 99.21 % Passed / No of Students : 250 / 252 Remarks/Status : Achieved	Achievement of Current Semester (20152016 / 1) 96.05 % Passed / No of Students : 146 / 152 Remarks/Status : Achieved
Area of Concern	Proposed Strategy	Upcoming Strategy
1. Student Performance	Let students critical thingking	Provide studio for design office.
2. Course Contents	Provide more notes	Add green building item
3. Delivery Methods	More discussion with students	add more example as per industry practicce
4. Assessment Methods	Upgrade student report with rubric	add log book for time frame.

Fig. 3-12. CQI report for CLO

More comprehensive CQI is also carried out in the class with students for every course. This is normally recorded in a faculty level form called CQI Report as presented in Fig. 3-13 which includes description of CQI activities, CQI topics and recommendations for

improvement. An example of CQI effort in Integrated Design Project is given in Fig. 3-14 and Fig. 3-15 where external practicing engineers were invited to examine the students presenting their projects.

3.6 PLO Achievement for Individual Student via MyPLO

The achievement of PLO at student level for every individual has been developed and displayed through MyPLO. The detail achievement of an individual student is presented in Fig. 3-16.

3.7 Complex Engineering Problem in PLO

Complex Engineering Problem are defined as engineering problems that have some or all of the following characteristics: (1) involve wide ranging or conflicting technical or engineering issues; (2) have no obvious solution and require originality in analysis; (3) involve infrequently encountered issues; (4) are outside problems encompassed by standards and code of practice for professional engineering; (5) involve diverse group of stakeholders with wide varying needs; (6) have significant consequences in a range of contexts; (7) cannot be resolved without an in-depth engineering knowledge .

Complex Engineering Problem (CEP) is mentioned in PLO 1, PLO 4, PLO 10 and PLO 11, all four PLOs being designated with Cognitive Domain as the primary domain type in FKAAS. Under CEP, accompanying attributes related to Complex problem solving (WP) and Complex engineering activities (EA) can be found within other different PLO. Such attributes are found across all courses offered and having different degree of complexity. However, for a start, 11 courses and all elective courses have been specially selected to showcase CEP components. This is given in Table 3-7. Each of these courses has been assigned to various CPS attributes. The CEP activities for every attribute are described in a form as shown in Fig. 3-17.

UTHM

Continual Quality Improvement (CQI) Report
Faculty of Civil and Environmental Engineering

CQI Report (OBE Form)			
Programme :	**Bachelor of Civil Engineering with Honours**	Semester :	**II**
Course Name :	**Hydraulics**	Session :	**2014/2015**
Course Code :	**BFC 21103**	Section :	**1, 2, 3, 5 & 6**
Coordinator :	**Tan Lai Wai**	Cohort :	**BFF0405-8**

KPI	**50% of students achieve 55% marks**			**Achieved**	**~~Not achieved~~**
CLO 1 (Cognitive)	Explain the concept of uniform and non-uniform flows in open channel, hydraulic structure and machinery (C4, PLO1)				
Number of students that require CQI for Test 1 (score less than 55%)	88 (31.2%)	**Attach "Laporan Keseluruhan Kursus" for Test 1 (from TCIS) (Appendix 1)**			
Number of students that require CQI for Test 2 (score less than 55%)	178 (63.1%)	**Attach "Laporan Keseluruhan Kursus" for Test 2 (from TCIS) (Appendix 1)**			
CQI activities	**Additional Class**	**Additional Exercise**	**Additional Notes**	**Different Delivery Approaches**	**Self-assessment**	**Other**
Please tick (x)	–	x	x	x	x	x
Description on CQI activities	Students were given more exercises, additional notes (also in graphic & video formats to create interest), and also trial exams to help students improve their grasps of the learning outcomes.					

Description on topics where CQI has been conducted (Attach examples and pictures as proof)

1) Careless mistakes in calculating open channel flow characteristics (**Appendix 2**). Students were always informed that if mistakes were done earlier in the calculations, the end results of analysis will be affected.
2) Students have problems in derivation and mathematical equations. **Appendix 3** shows how WhatsApp and online learning management system AUTHOR are used in delivering lessons.
3) Video and photos were used in learning and teaching of Hydraulics to relate students to the engineering practices (**Appendix 4**).
4) Additional notes and exercises were conducted throughout the semester for Hydraulics. For every chapter, new exercise questions were discussed during the tutorial sessions (**Appendix 5**).

Suggestion of improvement in the next semester:

Current CQI activities can be maintained as comparison between Test 1, Test 2 and Final Examination results shows that CQI activities conducted have help student in improving their achievement in Final Examination. Variety of delivery approaches can be proposed ahead of next semester as to ensure students realize the importance of the learning outcomes and how they relate to the civil engineering practices. Apart from CQI activies on students, staff also attended variety of learning and teaching courses to enhance the skills (**Appendix 6**).

Prepared by : **Date :**

Tan Lai Wai

Tan Lai Wai **08 July 2015**

Fig. 3-13. CQI report at faculty level

Fig. 3-14. CQI briefing of IDP evaluation to external panels

Fig. 3-15. Evaluation of IDP project – a CQI effort

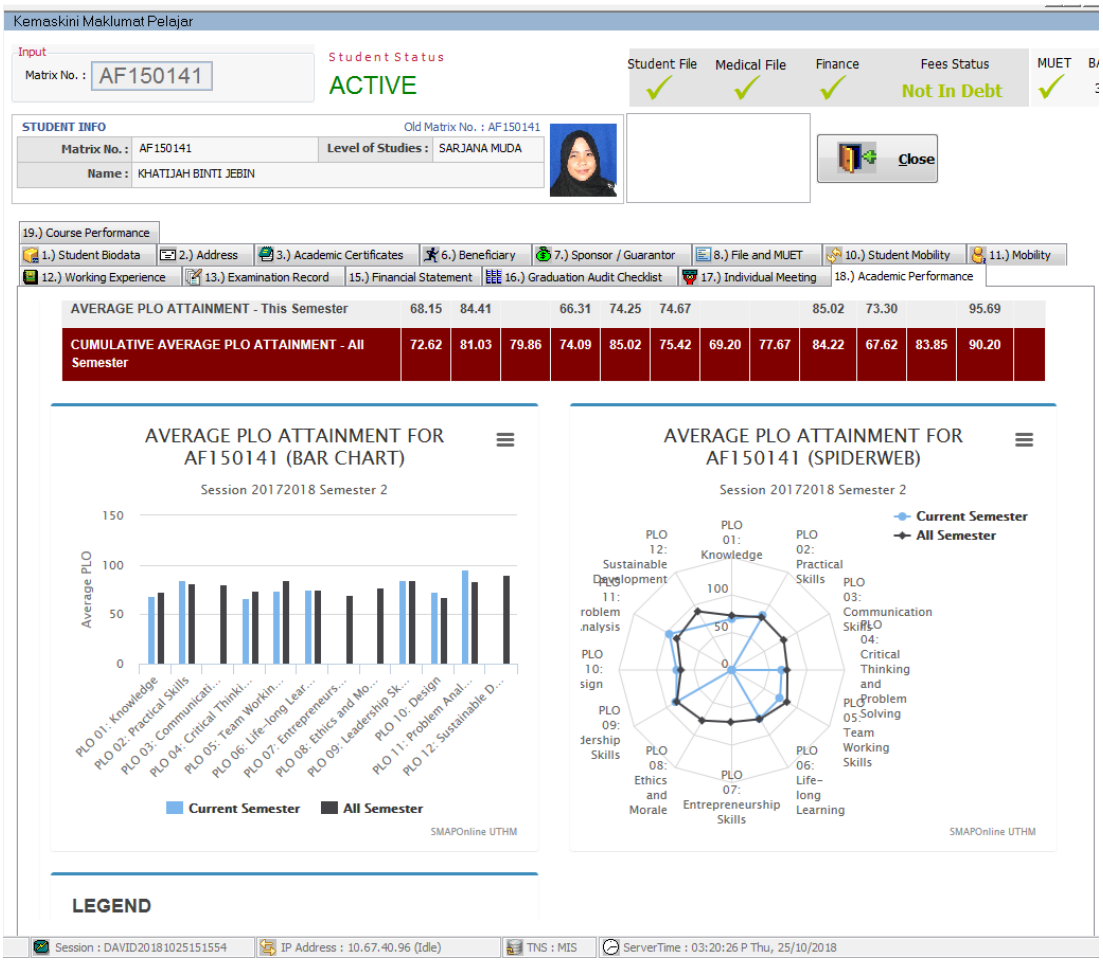


Fig. 3-16. MyPLO summary achievement of individual student

Table 3-7. Selected courses for CEP components

No	Course Code	Courses
1	BFC 23702	Creativity and Innovation
2	BFC 32703	Sustainable Construction Management
3	BFC 32102	Reinforced Concrete Design I
4	BFC 32803	Reinforced Concrete Design II
5	BFC 43003	Structural Steel and Timber Design
6	BFC 21502	Geomatic Practice
7	BFC 43103	Foundation Engineering
8	BFC 32403	Environmental Engineering
9	BFC 32904	Industrial Training
10	BFC 43303	Integrated Design Project
11	BFC 43402	Final Year Project I and II
12	BFX 4xxx3	Elective

CEP Form OBE FKAAS 2015

COMPLEX ENGINEERING PROBLEM (CEP) DESCRIPTIVE FORM FOR FKAAS

COURSE CODE: **BFC43003**

COURSE NAME: **STRUCTURAL STEEL AND TIMBER DESIGN**

		PLO		LEVEL
CLO 1	Design the steel and timber structure elements according to BS EN 1993 and BS EN 1995.	10	C	5
CLO 2	Manipulate structural design processes to complete the assigned project.	9	P	4
CLO 3	Organize the design works report in group affectively which comprise of ideas and problem solving.	5	A	4

COMPLEX PROBLEM SOLVING (CPS) MATRIX

ATTRIBUTE	1	2	3	4	5	6	7	8	9
(tick)	/		/					/	/

CPS ATTRIBUTE	ASSESSMENT METHOD	TOPIC	CEP ACTIVITY DESCRIPTION
(1) Depth of knowledge required	Project	Beam, Column, Truss, Connection	Students are to perform the following activities: Layout planning, load distribution and analysis, design calculations, structural drawing and detailing. The project activities involve proposing a design for either a residential medium-rise, bus station or stadium grandstand. Wide ranging, indepth fundamental engineering knowledge are required.
(3) Depth of analysis required	Project	Beam, Column, Truss, Connection	In order to solve the given project, the students need to demonstrate and perform lengthy and in-depth analysis and calculations. Some analysis do not have obvious solutions for example in the design of long span truss frames. The students need to understand the fundamental concept of statics and mechanics before pursuing the analysis either by hand or using software.
(8) Consequences	Project	Beam, Column, Truss, Connection	A good design will be economical and easy to build. A poor design will be costly and hard to build. Detailing skills are also important.
(9) Judgment	Project	Beam, Column, Truss, Connection	The student will be assessed on their judgment especially in the layout planning activity. Good judgment brings about good decision making also in the load distribution and load combinations for the design works.

Fig. 3-17. Complex Engineering Problem Form

3.8 Summary of PLO Attainment

With the three Assessment Methods for PLO described in Fig. **3-1**, in order to show that every PLO for BFF programme has been achieved, the overall average of all three assessments must be no less than 55%. This is the overall key performance indicator (KPI) set for PLO attainment. Table 3-8 to Table 3-10 present the summary PLO attainment for year 2016 to 2018, respectively.

Table 3-8. PLO attainment for 2016

	PLO	SEM 1	SEM 2	CLO-PLO	Exit Survey	FCEE	Ave All	KPI ≥ 55%
1	K	65.7	64.1	64.9	74.0	54.8	64.6	PASS
2	PS	76.9	76.6	76.7	72.0		74.4	PASS
3	CS	80.9	79.3	80.1	71.0		75.6	PASS
4	CTPS	75.5	70.7	73.1	71.0	47.5	63.9	PASS
5	TW	80.5	79.5	80.0	80.0		80.0	PASS
6	LL	87.1	81.7	84.4	78.0		81.2	PASS
7	ES	57.3	69.7	63.5	80.0		71.7	PASS
8	ET	66.3	65.4	65.9	83.0		74.4	PASS
9	LS	83.6	81.0	82.3	78.0		80.1	PASS
10	DDS	60.2	56.6	58.4	69.0	65.4	64.3	PASS
11	PA	66.7	61.2	64.0	69.0	50.1	61.0	PASS
12	ESus	83.5	82.2	82.8	81.0		81.9	PASS
13	Esoc	79.9	80.3	80.1	77.0		78.6	PASS

The results conclude that PLO attainment for all three years 2016, 2017, and 2018 have similar patterns. The low PLO achievements are the Cognitive Domain PLO, namely PLO 11 – PA with score range between 60.4% to 63.5%, PLO 4 – CTPS with score range between 63.9% and 67.6%, PLO 10 – DDS with score range between 62.7% to 64.3%, and PLO 1 – K with score range between 60.1% to 64.6%. The highest PLO achievement is noted for PLO 12 – ESus with score range 81.9% to 83.3%. Across the consecutive three years, significant improvements of PLO achievement are found in PLO 2 – PS

(from 74.4% to 80.8%), PLO 3 – CS (from 75.6% to 80.4%), and PLO 9 – LS (from 80.1% to 82.2%). Other maintained strength in PLO are PLO 5 – TW and PLO 6 – LL. All the PLOs satisfy the PLO KPI of no less than 55%.

Table 3-9. PLO attainment for 2017

	PLO	SEM 1	SEM 2	CLO-PLO	Exit Survey	FCEE	Ave All	KPI ≥ 55%
1	K	62.9	62.6	62.8	79.0	38.4	60.1	PASS
2	PS	77.9	80.0	78.9	78.0		78.5	PASS
3	CS	82.4	79.9	81.2	80.0		80.6	PASS
4	CTPS	71.7	72.8	72.3	78.0	52.6	67.6	PASS
5	TW	80.8	83.8	82.3	83.0		82.6	PASS
6	LL	83.1	79.1	81.1	81.0		81.0	PASS
7	ES	84.4	73.7	79.0	81.0		80.0	PASS
8	ET	70.7	57.8	64.3	85.0		74.6	PASS
9	LS	79.4	82.6	81.0	82.0		81.5	PASS
10	DDS	62.4	59.6	61.0	74.0	58.0	64.3	PASS
11	PA	64.3	68.1	66.2	71.0	44.0	60.4	PASS
12	ESus	81.5	85.7	83.6	83.0		83.3	PASS
13	Esoc	80.2	81.8	81.0	82.0		81.5	PASS

Table 3-10. PLO attainment for 2018

	PLO	SEM 1	SEM 2	CLO-PLO	Exit Survey	FCEE	Ave All	KPI ≥ 55%
1	K	65.5	64.7	65.1	83	43.0	63.7	PASS
2	PS	81.8	83.2	82.5	79		80.8	PASS
3	CS	80.4	81.3	80.9	80		80.4	PASS
4	CTPS	69.8	73.2	71.5	79	52.3	67.6	PASS
5	TW	83.5	83.6	83.5	85		84.3	PASS
6	LL	81.4	83.7	82.6	86		84.3	PASS
7	ES	75.0	78.2	76.6	84		80.3	PASS
8	ET	66.8	67.7	67.3	88		77.6	PASS
9	LS	80.1	82.6	81.3	83		82.2	PASS
10	DDS	65.5	62.3	63.9	73	51.1	62.7	PASS
11	PA	63.6	62.1	62.8	76	51.8	63.5	PASS
12	ESus	84.1	82.2	83.2	83		83.1	PASS
13	Esoc	84.9	83.3	84.1	84		84.1	PASS

4 REPORT CONCLUSION

This report provides the evidences of OBE implementation and the measurement both direct and indirect to demonstrate the attainment of FKAAS PEO and PLO for year 2016, 2017 and 2018.

Appendix 2-1 PEO Employer Survey

Version 2016

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)
EMPLOYER SURVEY

EMPLOYER DETAILS

1. Name :
2. Email :
3. Contact Number :
4. Company Address :
5. I am a : ☐ Consultant
   ☐ Contractor
   ☐ Developer
   ☐ Manufacturer
   ☐ Government Agency
   ☐ Others : _____
6. Date Of This Survey :

ALUMNI STATISTICS

Total number of UTHM Alumni you are employing

	1 Person	2 Person	3 Person	4 Person	5 Person	6 Person	7 Person	8 Person	9 Person
Graduated 3 to 5 years ago									

If more than 9 persons please state : _____

GRADUATE RATING (graduated 3 to 5 years ago)
Kindly rate UTHM graduates

Please rate the strength of UTHM alumni.

		Fail	Poor	Average	Good	Excellent
1.	Knowledgeable in Engineering, Mathematics & Science	1	2	3	4	5
2.	Technically competent	1	2	3	4	5
3.	Have a sense of number and dimensions	1	2	3	4	5
4.	Proficient in spoken English	1	2	3	4	5
5.	Proficient in written English	1	2	3	4	5
6.	Able to prepare and deliver presentation	1	2	3	4	5
7.	Able to prepare report containing words and drawings	1	2	3	4	5
8.	Able to lead a given task or project	1	2	3	4	5
9.	Able to work with others in a team	1	2	3	4	5
10.	Able to solve problems related to work	1	2	3	4	5
11.	Willing to share ideas	1	2	3	4	5
12.	Willing to do things in the right way	1	2	3	4	5
13	Willing and able to follow instruction	1	2	3	4	5
14	Show concerns for safety, quality and environmental protection	1	2	3	4	5
15	Have basic interpersonal skills	1	2	3	4	5
16	Bold and courageous to explore new ideas	1	2	3	4	5
17	Often ready to initiate ideas	1	2	3	4	5
18	Enthusiastic and productive at work	1	2	3	4	5
19	Willing to learn and improve technical abilities	1	2	3	4	5
20	Able to understand and meet expectations of customers	1	2	3	4	5

THANK YOU

Appendix 2-2 PEO Alumni Survey

Version 2016

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

ALUMNI SURVEY

PART 1 : PERSONAL DETAILS

1. Name :
2. Email :
3. Contact Number :
4. Year Graduate Degree Programme :
5. Position :
6. Company Address :

PART 2: PROGRAMME EDUCATIONAL OBJECTIVES

Please rate on a scale of 1 (Very Poor) to 5 (Excellent) how well has each of these PEO been achieved in you from the day you graduated until now

		Very Poor	Poor	Average	Good	Excellent
PEO 1	Knowledgeable and technically competent in civil engineering discipline in-line with the industry requirement.	1	2	3	4	5
PEO 2	Effective in communication and demonstrate good leadership quality in an organization	1	2	3	4	5
PEO 3	Capable to solve civil engineering problems innovatively, creatively and ethically through sustainable approach	1	2	3	4	5
PEO 4	Able to demonstrate entrepreneurship skills and recognize the need of life-long learning for successful career advancement	1	2	3	4	5

PART 3: TRACER STUDY FOR ALUMNI

Programme Educational Objectives (PEO) FKAAS

Please tick in the box below.

1.	Have been promoted or offered to a better position	☐ Yes	☐ No
2.	Have been involved in research/construction project proposal either as member or leader	☐ Yes	☐ No
3.	I am a Professional Engineer (PE)	☐ Yes	☐ No
4.	Have published papers in conference/journal	☐ Yes	☐ No
5.	Have held leadership positions for a taskforce or project within an organization	☐ Yes	☐ No
6.	Have been involved in civil engineering design/construction projects	☐ Yes	☐ No
7.	Have been involved in research and/or development projects related to civil engineering	☐ Yes	☐ No
8.	Have been attending Continuous Professional Development courses.	☐ Yes	☐ No
9.	Have furthered studies to a higher degree	☐ Yes	☐ No
10.	Have ventured into business (self-owned or partnership)	☐ Yes	☐ No

THANK YOU

Appendix 3-1 PLO Exit Survey

EXIT SURVEY PROGRAM LEARNING OUTCOME (PLO) FKAAS

Please rate (tick in the box below) on a scale of 1 (POOR) to 5 (EXCELLENT) how well has each of the 13 PLO been achieved in you.

PART 1: PERSONAL DETAILS

1. Name :
2. Matric Number :
3. Gender :
4. Working Status :
   - ☐ Further Study Master or PhD
   - ☐ Not Employed
   - ☐ Employed (Civil Engineering)
   - ☐ Employed (Not Civil Engineering)

PART 2: PROGRAM LEARNING OUTCOME (PLO)

Please rate (tick in the box below) on a scale of 1 (Fail) to 5 (Excellent) how well has UTHM graduates fulfil these PLO

		Fail	Poor	Average	Good	Excellent
1.	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex civil engineering problems.	1	2	3	4	5
2.	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex civil engineering activities, with an understanding of the limitations.	1	2	3	4	5
3.	Communicate effectively on complex civil engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	1	2	3	4	5
4.	Conduct investigation into complex problems using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	1	2	3	4	5
5.	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	1	2	3	4	5

6.	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	1	2	3	4	5
7.	Self-motivate and enhance entrepreneurship skills for career development.	1	2	3	4	5
8.	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.	1	2	3	4	5
9.	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	1	2	3	4	5
10.	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	1	2	3	4	5
11.	Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	1	2	3	4	5
12.	Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.	1	2	3	4	5
13.	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.	1	2	3	4	5

PART 3: VERIFICATION

E-mail : _____

THANK YOU