



**DEPARTMENT OF CIVIL ENGINEERING, FACULTY OF ENGINEERING,
UNIVERSITI MALAYA**

**EVALUATION OF COURSE LEARNING OUTCOME ACHIEVEMENT
SEMESTER 1 SESSION 2009/2010**

Course Code : KAEA 2132
Course Title : Soil Mechanics I
Course Type : Departmental Core Course

1. Course Learning Outcome Assessment Plan :

COURSE LEARNING OUTCOMES (CO)	METHOD OF DELIVERY	METHOD OF ASSESSMENT	Examination question addressing the CO
CO1 : Ability to define soil as in engineering context and relate problems associated with the definition with local soil condition	Lectures and coursework	Examination and short report	Q1
CO2 : Ability to identify and differentiate the different types of soil and their properties and classify soil using British and / or Unified Soil Classification System.	Lectures and laboratory work	Short test and laboratory work/report	none
CO3 : Ability to conduct laboratory tests for determination of soil index and soil compaction.	Demonstration and laboratory work.	Direct observation on laboratory work/report	none
CO4 : Ability to solve calculation problem using mechanics involving physical properties, compaction, seepage and effective stress.	Lecture and tutorials	Examination & graded tutorial.	Q2, Q3, Q4
CO5 : Ability to show the use of soil mechanics concepts in engineering works	Lecture, active session and coursework.	Short report & group interview	Q1

Formative Assessment (55%)

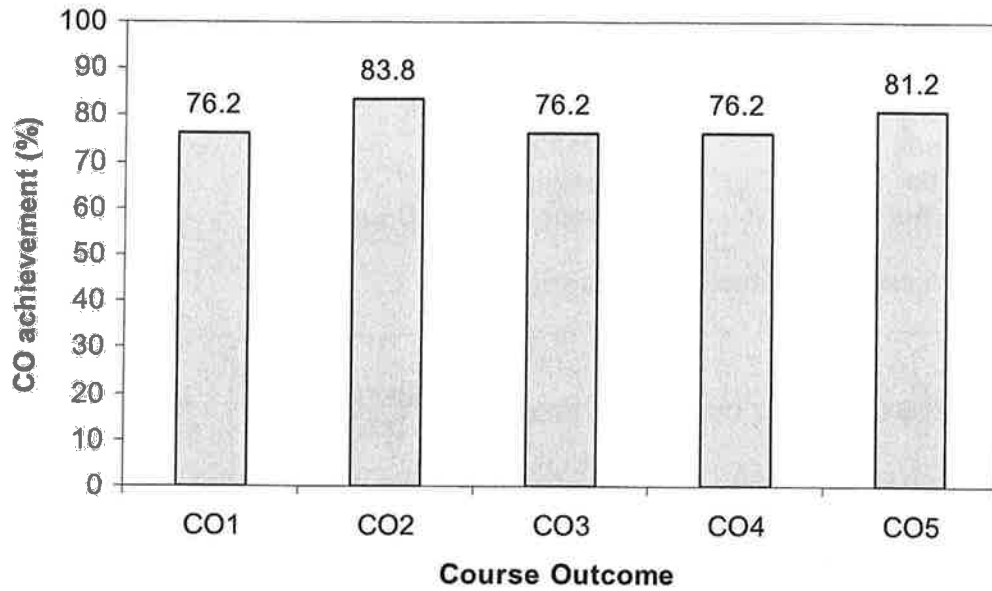
Assessment method	CO addressed	Weightage
Short Test (soil Classification)	CO2	10%
Coursework report & interview	CO1, CO5	20%
Laboratory (MT1 & MT2)	CO2, CO3	20%
Direct observation and lab report)		
Graded Tutorial (Flownet)	CO4	5%

Summative Assessment (45%)

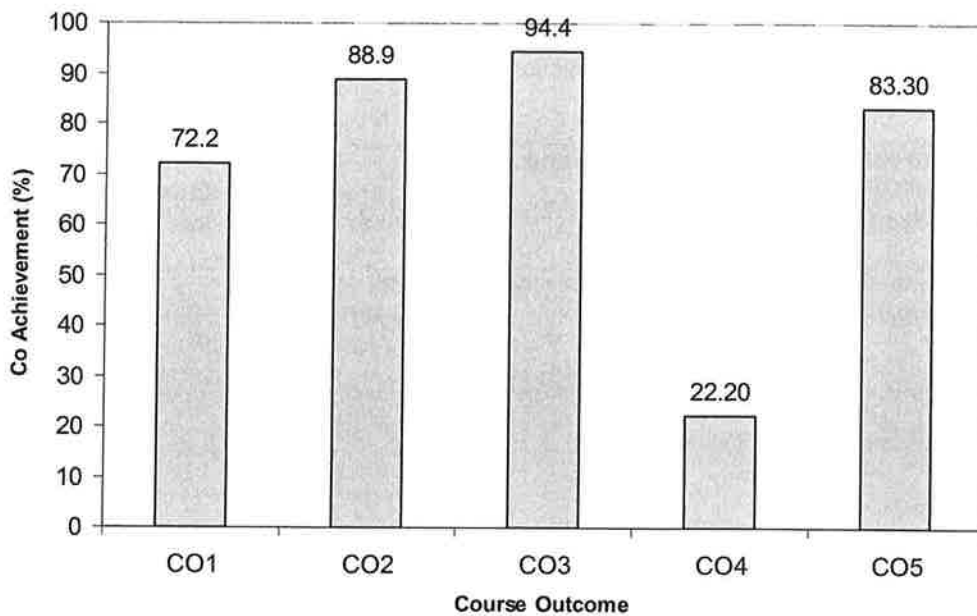
(Students to answer 3 questions out of 4 questions given)

Assessment method	CO addressed	Weightage
Soil definition and related problem	CO1	15%
Calculation and solving problem related to Compaction	CO4	15%
Permeability & seepage		15%
Effective stress		15%

2. Course Learning Outcome Achievement (CO Achievement) :



(a) Indirect measurement via student perception through end of semester survey
(* refer to attachment 1: end of semester student survey on CO – average)



(b) Direct measurement via course assessment methods
(* refer to attachment 2: CO achievement - PI)
Note : PT= 80% students achieved more than 50% of each CO

Figure 1 : Course Learning Outcome achievement measured through indirect and direct measurements.

3. Contribution of Course Learning Outcome (CO) to Programme Outcome (PO) :

COURSE LEARNING OUTCOMES (CO)	PROGRAMME LEARNING OUTCOMES (PO)										ASSESSMENT	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		
CO1: Define soil as in engineering context and relate problems associated with the definition with local soil condition					72.2							Examination and short report
CO2 : Identify and differentiate the different types of soil and their properties and classify soil using British and / or Unified Soil Classification System.	88.9	88.9										Short test and laboratory work/report
CO3: Conduct laboratory tests for determination of soil index and compaction.	94.4	94.4			94.4							Laboratory work/report
CO4: : Solve calculation problem using mechanics involving physical properties, compaction, seepage and effective stress.	22.2	22.2										Examination, laboratory report & graded tutorial.
CO5 : Show the use of soil mechanics concepts in engineering works	83.3				83.3					83.3		Short report and group interview
Percentage carried to PO	72.2	68.5			83.3					83.3		

(* from direct measurement- course assessment)

4. Students Performance According to University Grading System

M/SURAT : 1

SENARAI BILANGAN CALON MENGIKUT SUBJEK
SESI : 2009/2010 SEMESTER : 1

MASA : 11:20

KOD SUBJEK : KAEA2132

BIL CALON : 18

MEAN : 55.47

STDDEV : 9.55

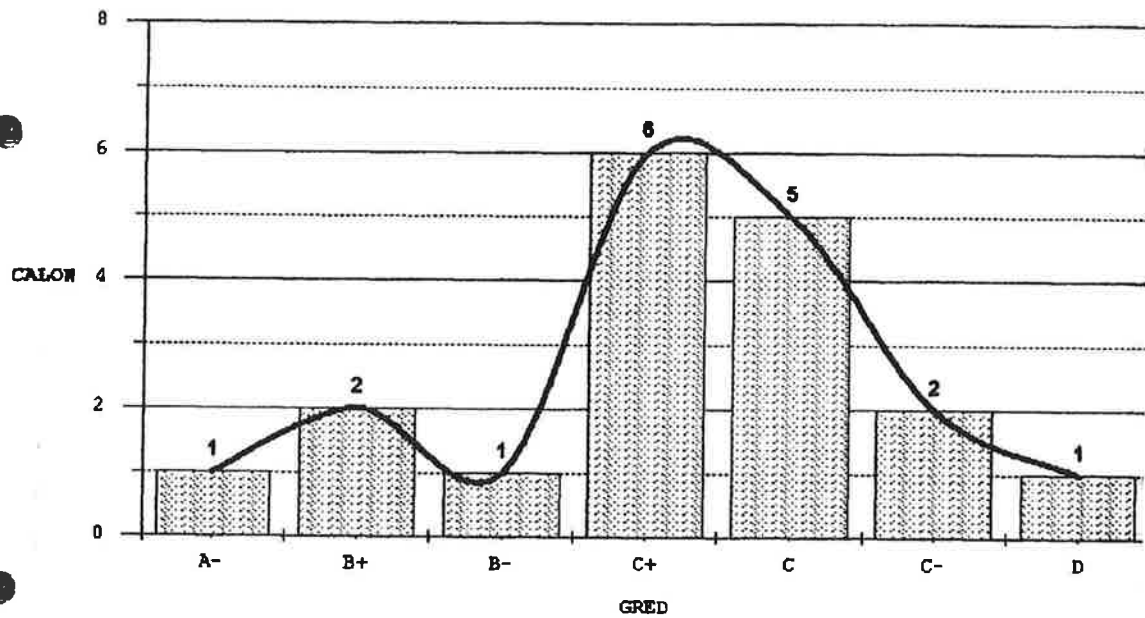


Figure 2 : Distribution of students performance to university grading system

Table 1 : Students performance to the various bands

Band	Failed (0 – 49%)	Moderate (50 – 69%)	Good (>70%)
	[C– and below]	[C to B]	[B+ to A]
Nos. Students	3	12	3
Percentage (%)	17	66	17

(* total number of students is 18)

5. Instructor's Comment :

- a. From Figure 1(a) students believed that they have achieved all five course learning outcome.
- b. However, actual student performance via direct measurement (Figure 1(b)), shows there are 2 CO's (i.e. CO1 and CO4) not being achieved in accordance to Performance Target (PT : 80% students in class achieved more than 50% in each CO).
- c. CO4 was found to be the lowest (22.2%). Analysis shows that this is due to large percentage (30-45% from calculation question and 5% from graded tutorial) of CO4 being measured through high stake assessment; that is final examination which may be disadvantage in this case.
- d. Achievement of CO3 being the highest perhaps due to direct observation using rubric being used.
- e. CO4 does not seem to cause dramatic negative effect on PO.
- f. Better assessment method such as interview and critical review report in PBL assessment activity proved to enable in-depth learning. Implementation of PBL and non-traditional assessment method did not impair achievement of CO.


6. Future Action Plan For CQI :

- a. It is important for CO4 in Engineering field to achieve its performance target (PT) . The fact that it is well below PT, assessment method for this CO need to be refined. This may be improved either by not confining large percentage of this CO to final examination or more effort need to be given to prepare students to such assessment method.
- b. Keeping CO4 assessment method, more calculation exercises are to be given as classroom activities in the next semester (change in classroom instruction / delivery method).
- c. The overall design of this course is to be refined further for its constructive alignment. Better examination question setting is to be considered.(i.e. make Q1 – compulsory and answer 2 calculation questions from Q2,Q3 and Q4).
- d. Assessment rubrics need to be refined from content-based to outcome-based for several assessment methods employed.
- e. Assessing laboratory work via direct observation using rubric need to be improved.

7. Instructor's Detail :

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Attachment 1 :

	<p>DEPARTMENT OF CIVIL ENGINEERING, FACULTY OF ENGINEERING, UNIVERSITI MALAYA</p> <p>COURSE OUTCOMES SURVEY FORM SEMESTER 2 SESSION 2007/08</p>
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Name : _____

Matrix No. : _____

Subject/ Code : KAEA 2132 : Soil Mechanics I

Please rate your level of **achievement** of Course Outcomes in the scale from 1 to 5 as described below.

[1]	[2]	[3]	[4]	[5]
Poor	Fair	Average	Good	Excellent

The Course Outcomes for this subject are:

No.	Course Outcomes (CO)	Achievement				
		1	2	3	4	5
1	Ability to define soil as in engineering context and relate problems associated with the definition with local soil condition					
2	Ability to identify and differentiate the different types of soil and their properties and classify soil using British and / or Unified Soil Classification System.					
3	Ability to conduct laboratory tests for determination of soil index and soil compaction.					
4	Ability to solve calculation problem using mechanics involving physical properties, compaction, seepage and effective stress.					
5	Ability to show the use of soil mechanics concepts in engineering works					

If your rating for any of the outcomes is less than 3, please give comments and suggestions how it can be improved.

Thank you for your cooperation.

Attachment 1 – Student Perception on CO achievement Result

DEPARTMENT OF CIVIL ENGINEERING, FACULTY OF ENGINEERING, UNIVERSITI MALAYA

COURSE OUTCOMES SURVEY FORM

RESULTS OF SURVEY (SEMESTER 1 SESSION 2009/ 2010)

16 Respondents (students)

SUBJECT/CODE :SOIL MECHANICS 1 /KAEA2132

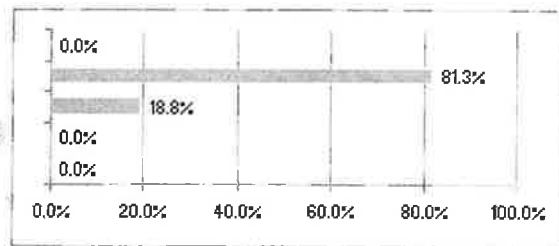
Please rate your level of achievement of Course Outcomes in the scale from 1 to 5 as described below.

[1] **[2]** **[3]** **[4]** **[5]**
Poor **Fair** **Average** **Good** **Excellent**

CO1 Define soil as in engineering context and relate problems associated with local soil condition

0	0.0%	[1]
0	0.0%	[2]
3	18.8%	[3]
13	81.3%	[4]
0	0.0%	[5]

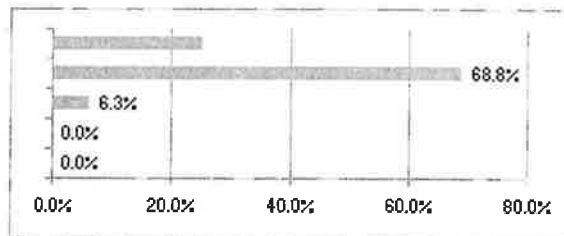
Average	3.81
Answer rate	16
	16



CO2 Identify and differentiate the different types of soil and their properties and classify soil using British and / or Unified Soil Classification System

0	0.0%	[1]
0	0.0%	[2]
1	6.3%	[3]
11	68.8%	[4]
4	25.0%	[5]

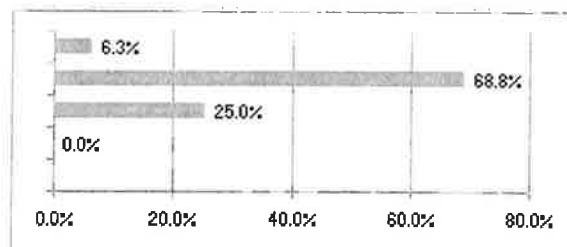
Average	4.19
Answer rate	16
	16



CO3 Conduct laboratory tests for determination of soil index and compaction

0	0.0%	[1]
0	0.0%	[2]
4	25.0%	[3]
11	68.8%	[4]
1	6.3%	[5]

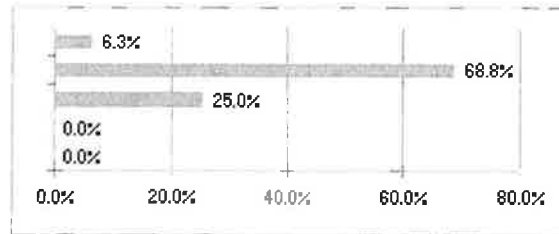
Average	3.81
Answer rate	16
	16



CO4 Solve calculation problem using mechanics involving physical properties, compaction, seepage and effective stress

0	0.0%	[1]
0	0.0%	[2]
4	25.0%	[3]
11	68.8%	[4]
1	6.3%	[5]

Average	3.81
Answer rate	16
	16



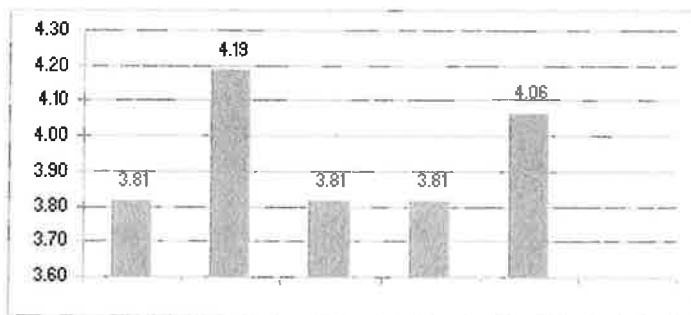
CO5 Show the use of soil mechanics concepts in engineering works

0	0.0%	[1]
0	0.0%	[2]
4	25.0%	[3]
7	43.8%	[4]
5	31.3%	[5]

Average	4.06
Answer rate	16
	16



Overall Finding of CO (SOIL MECHANICS 1)



Attachment 2 : CO Achievement

SOIL MECHANICS I																																									
SEMESTER I / SESEI 2009-2010																																									
No	Matric No	Laboratory/20				Cont. assmt /35				Exam/45				Grand				Individual Attainment of CO																							
		MT1	MT2	Subst	Tut	MT1	CWR	Tut	Subst	Q1	Q2	Q3	Q4	Subst	Total	CO1(%)	CO2	CO2(%)	CO3	CO3(%)	CO4	CO4(%)	CO5	CO6(%)																	
1	KEA08003	6.3	0.0	6.3	4.5	5.0	9.0	0.0	23.5	5.0	1.5		0.0	6.5	36.3	0.5	54.3	0.4	35.8	0.3	31.3	0.0	4.3	0.7	70.0																
2	KEA07004	6.3	5.0	11.3	7.0	7.0	9.0	4.0	32.0	12.0	8.5		7.0	27.5	70.8	0.8	80.0	0.6	60.8	0.6	56.3	0.6	55.7	0.8	80.0																
3	KEA08000	6.3	5.0	11.3	5.0	8.0		4.5	29.5		1.0	6.0	0.0	7.0	47.3	0.8	75.0	0.5	54.2	0.6	56.3	0.2	23.0	0.8	75.0																
4	KEA08000	6.3	5.0	11.3	5.0	8.0	7.5	5.0	30.5		1.0	10.0	0.0	11.0	52.8	0.8	77.5	0.5	54.2	0.6	56.3	0.3	32.0	0.8	77.5																
5	KEA08000	6.3	5.0	11.3	5.0	8.0	7.5	4.5	30.0		1.0	5.5	3.5	10.0	51.3	0.8	77.5	0.5	54.2	0.6	56.3	0.3	29.0	0.8	77.5																
6	KEA08000	6.3	5.0	11.3	6.0	8.0	7.5	4.0	30.5	10.5	1.0	1.5		13.0	54.8	0.7	74.3	0.6	57.5	0.6	56.3	0.1	14.3	0.8	77.5																
7	KEA08001	6.8	7.5	14.3	9.0	8.0	7.5	5.0	34.5		4.5	8.0	14.0	26.5	75.3	0.8	77.5	0.8	77.5	0.7	71.3	0.6	63.0	0.8	77.5																
8	KEA08001	6.8	7.5	14.3	7.5	8.0	7.0	4.0	31.5		2.0	3.0	8.0	13.0	58.8	0.8	75.0	0.7	72.5	0.7	71.3	0.3	34.0	0.8	75.0																
9	KEA08001	6.8	7.5	14.3	8.0	6.0	9.0	4.0	32.0		4.5	3.5	1.5	9.5	55.8	0.8	75.0	0.7	74.2	0.7	71.3	0.3	27.0	0.8	75.0																
10	KEA08002	6.8	7.5	14.3	6.0	5.0	9.0	4.5	29.5	12.0	8.5		7.0	27.5	71.3	0.7	74.3	0.7	67.5	0.7	71.3	0.6	57.1	0.7	70.0																
11	KEA08002	6.8	7.5	14.3	5.0	8.0	7.0	4.5	29.5		3.0	6.5	7.0	16.5	60.3	0.8	75.0	0.6	64.2	0.7	71.3	0.4	42.0	0.8	75.0																
12	KEA08003	6.8	7.5	14.3	5.5	5.0	6.0	5.0	26.5	6.0		7.5	2.0	15.5	58.3	0.5	48.6	0.7	65.8	0.7	71.3	0.4	41.4	0.6	55.0																
13	KEA08003	7.5	4.0	11.5	6.5	6.0	3.5	4.0	25.0	6.0	7.0		5.0	18.0	54.5	0.4	44.3	0.6	60.0	0.6	57.5	0.5	45.7	0.5	47.5																
14	KEA08003	7.5	4.0	11.5	4.0	6.0	3.5	5.0	23.5	5.5		6.0	9.5	21.0	56.0	0.4	42.9	0.5	51.7	0.6	57.5	0.6	58.6	0.5	47.5																
15	KEA08003	7.5	4.0	11.5	5.5	6.0	3.5	4.5	24.5		5.0	5.0	4.0	14.0	50.0	0.5	47.5	0.6	56.7	0.6	57.5	0.4	37.0	0.5	47.5																
16	KES08002	7.5	4.0	11.5	7.5	8.0		4.0	31.5	2.0	2.0		3.0	7.0	50.0	0.5	48.6	0.6	63.3	0.6	57.5	0.3	25.7	0.8	75.0																
17	KES08002	7.5	4.0	11.5	0.0	5.0	6.0	5.0	21.0	7.0		6.5	5.0	18.5	51.0	0.5	51.4	0.4	38.3	0.6	57.5	0.5	47.1	0.6	55.0																
18	KES08002	7.5	4.0	11.5	2.5	5.0	6.0	3.0	21.5	8.5	2.0		1.5	12.0	45.0	0.6	55.7	0.5	46.7	0.6	57.5	0.2	18.6	0.6	55.0																
										74.5	52.5	69.0	78.0		55.4		64.1		58.6		60.3		36.4		67.4																
															72.2			88.9																							
															NA			A																							
															NA	A		89.4																							
															NA	A		22.2																							
															NA	A		NA																							
															NA	A		83.3																							

CO Achievement: % of students in class that achieved more than 50% of a particular CO

PT = CO Achievement: 80% of students in class that achieved more than 50% of a particular CO

