



Outcome Based Engineering (OBE) Education: Example from UTAR

Ir. Academician Emeritus Prof. Tan Sri Dato' Dr. HT Chuah

Chairman

Standing Committee on Engineering Education Federation of Engineering Institutions of Asia and the Pacific Lee Kong Chian Faculty of Engineering and Science Universiti Tunku Abdul Rahman





Constructive Alignment







An Example from Universiti Tunku Abdul Rahman (UTAR)







UTAR to to be a global university of educational excellence with transformative societal impact.



- Universal values in our beliefs (M1)
- Tenacity in overcoming challenges (M2)
- Agility in facing new frontiers (M3)
- **R**esponsibility in pursuit of excellence (M4)





PEO

<u>Program Education Objectives address the graduates</u> attainment within 3-5 years after graduation

BEng (Hons) Electrical and Electronic Engineering is to produce:
PEO 1: Graduates competent in practising fundamental scientific and engineering principles in E&E engineering in a creative and innovative manner.

PEO 2: Graduates capable of communicating and managing effectively in diverse areas of **E&E**.

PEO 3: Graduates practising professional ethics, life-long learning, and sustainable development for the betterment of the profession and society.



PO

Program Outcomes are what the students should have achieved by graduation time: address Cognitive (C), Psychomotor(P), and Affective (A) domains to be attained by students







Programme Outcomes for BEng (Hons) Electrical and Electronic Engineering

- 1. Acquire and apply fundamental knowledge of science, engineering and mathematics, with an engineering focus in solving complex engineering problems
- 2. Apply first principles of mathematics, natural and engineering sciences to identify, study, formulate and evaluate complex engineering problems based on systematic approach and leading to authenticated conclusions
- 3. Devise solutions for complex engineering problems and design systems, components or processes by taking into consideration cost-effectiveness and specific concerns for public health, safety and environment
- 4. Make use of research based knowledge and methodology through critical thinking to interpret, analyse, and study complex engineering problems, designs and operational performances to reach convincing conclusions





Programme Outcomes for BEng (Hons) Electrical and Electronic Engineering (Cont'd)

- 5. Apply original engineering techniques and state of the art engineering and IT resources to model, simulate and analyse complex engineering problems within the relevant constraints and range of validity
- 6. Apply appropriate knowledge in the evaluation and assessment of subject matters pertinent to the professional engineering practice with considerations of public health and safety, community welfare and cultural perspectives as well as legal, moral and ethical responsibilities
- 7. Recognise the significance of sustainable development when devising professional solutions to engineering problems with a clear understanding and pro-active considerations of environmental concerns as well as needs for eco-friendly continual growth for local and global community
- 8. Apply professional virtues and principles with strong commitment to moral and ethical responsibilities during the course of engineering practice





Programme Outcomes for BEng (Hons) Electrical and Electronic Engineering (Cont'd)

- 9. Demonstrate the ability to convey ideas and information effectively within the engineering profession and the general community when addressing complex engineering issues and activities, including unambiguous interpretation of data and instructions, enlightening oral presentations and writing skills evident in accurate documentation of designs and solutions
- 10. Display capability to work competently in the context of a diverse team within multidisciplinary environment, as an individual member with teamwork fortitude or as an inspiring leader with effective management skills
- 11. Recognize the need to take on independent life-long learning and continuous self improvement in the context of scientific and engineering advancement and professional development
- 12. Show capability to comprehend and apply engineering and management philosophy to manage projects of in cross disciplinary content, as a member or a leader in a team realising the importance of cost-effective design and solution for sustainable development





Relevance of Programme Outcomes to the Main Domains (example)

Engineering Programme Outcomes	Three Main Domains	Eight Learning Outcomes Domains
1-4, 6, 10, 12	Cognitive Domain	 Knowledge vi. Scientific methods, critical thinking and problem solving skills
5, 9, 10, 11	Psychomotor Domain	ii. Practical skills
6-12	Affective Domain	 iii. Social skills and responsibilities iv. Ethics, professionalism and humanities v. Communication, leadership and team skills vii. Lifelong learning and information management viii. Entrepreneurship and managerial skills





3 Components of a Course Outcome

1) **VERB** (describes what the learner will be doing, or the behaviour)

- By the end of this course/semester, students should be able to:
- <u>describe</u> the principles used in designing X.
- <u>evaluate</u> the strengths and weakness of ...

Well-written verbs must be (SMART)

- Specific
- Measurable
- Achievable
- Realistic
- Time frame

Avoid these words

- understand
- appreciate
- know
- learn
- aware
- familiar





3 Components of a Course Outcome

2) **<u>CONDITION</u>** (context under which the behaviour is to occur)

- <u>describe</u> the principles used in designing X (V)
- <u>describe</u> <u>orally</u> the principles used in designing X (V&C)
- <u>design</u> a beam (V)
- <u>design</u> a beam <u>using Microsoft Excel design template</u> (V&C)





3 Components of a Course Outcome

- 3) **CRITERIA/STANDARD** (criteria of acceptable level of performance)
- <u>describe</u> the principles used in designing X (V)
- <u>describe orally</u> the principles used in designing X (V&C)
- <u>describe orally</u> the <u>five</u> principles used in designing X (V&C&S)

- <u>design</u> a concrete beam. (V)
- <u>design</u> a concrete beam <u>using Microsoft Excel worksheet</u>. (V&C)
- <u>design</u> a concrete beam <u>using Microsoft Excel worksheet</u> based on <u>MS EN 1992-1-1: 2010 (NATIONAL ANNEX)</u> (V&C&S)





Common weaknesses in writing CO

• Non-observable/Non-measurable CO

At the end of the course, the students should be able to:

- 1. <u>understand</u> the theory of X
- 2. <u>know</u> how to write an effective learning outcomes.
- 3. <u>appreciate</u> the importance of keeping the environment clean
- Vague CO or CO that are too broad or general

By the end of the course, students should be able to:

- 1. use the computer
- 2. make presentation
- 3. comment on designs
- 4. design research





CO's

<u>Course Outcomes are expected to be achieved by every</u> student taking a certain course. CO achievement is measured through various assessment methods

UEEA 1313 BASIC ELECTRONICS

On completion of this course, students shall be able to:

- 1. Explain the operation of diode through circuit applications
- 2. Determine biasing circuit parameter for transistor
- 3. Analyze DC and AC parameters of transistor amplifiers
- 4. Demonstrate the use of transistor and operational amplifiers for analogue circuits
- 5. Present ethical responsibilities in report writing





Linking CO, PO's and PEO's

- Topics lead to course learning outcomes (CO)
- Course learning outcomes (CO) must relate to programme outcomes (PO)
- Programme outcomes (PO) address the programme educational objectives (PEO)
 - What kind of graduates are we producing?























CQI – Closing Loop

















*APMR: Annual Programme Monitoring Report





COs of Courses Mapping to POs



		Programme Outcome (PO)											
Course Code	Course Description	1	2	3	4	5	6	7	8	9	10	11	12
UEEA1323	Digital Electronics	\checkmark											
UEEA1243	Circuit Theory	\checkmark											
UEEA1313	Basic Electronics												
UEEA1453	Power Systems												
UEEA1253	Signals Circuits and Systems	\checkmark											
UEEA1333	Analogue Electronics	\checkmark											
UEET2513	Analogue Communications	\checkmark								\checkmark			
UEEA2263	Introductory Electromagnetics	\checkmark											
UEEA2633	Microprocessor and Microcontroller systems	\checkmark		\checkmark						\checkmark			
UEEA2433	Electrical Machines	\checkmark								\checkmark			
UEEA2273	Electromagnetic Fields and Waves	\checkmark						\checkmark					
UEEA2523	Communication Systems	\checkmark											
UEEA2413	Process Control and Instrumentation	\checkmark		\checkmark									
UEEA2473	Power Electronics and Drives	\checkmark											
UEEA2663	Electrical Drives	\checkmark	\checkmark	\checkmark									
UEEA2183	Digital Signal Processing	\checkmark											
UEEA3423	Control Systems	\checkmark		\checkmark						\checkmark			
UEEA3773	Power Transmission and Distribution	\checkmark	\checkmark	\checkmark									
UEGE3114	Industrial Training	\checkmark		\checkmark						\checkmark			
UEEA4653	Computer Architecture	\checkmark								\checkmark			
UEEA4483	High Voltage Engineering	\checkmark											
UEEA4833	Electrical Design and Utilisation	\checkmark											
UECM1723	Mathematical Techniques for Engineering			\checkmark									
UECS1643	Fundamentals of Programming	\checkmark								\checkmark			
UECM1653	Mathematics for Engineering I	\checkmark											
UECM1713	Mathematics for Engineering II												
UECM2623	Numerical Methods and Statistics												
UEGE4113	Project												
UEEA2223	Integrated Circuit Design												

Ø

COs of Courses Mapping to POs



		Programme Outcome (PO)											
Course Code	Course Description	1	2	3	4	5	6	7	8	9	10	11	12
UEEA2343	Solid State Electronics												
UEEA3373	Optics and Optoelectronics / Optoelectronics	\checkmark	\checkmark		\checkmark								
UEEA2113	Electronic Product Design												
UEEA3366	Renewable Energy												
UEEA3993	Power Protection and Switchgear												
UEEA3753	Transient Stability and Controls							\checkmark					
UEEA3383	Wind and Solar Power Engineering												
UEEA3393	Introduction to Nuclear Engineering												
UEEA4663	Embedded System Design												
UEET4293	Electromagnetic Compatibility												
UEME4253	Project Management												
UEME4393	Quality and Reliability Engineering												
UEMH4113	Automation and Robotics												
UECS 2023	Multimedia Technology												
MPW2113/	Bahasa Kebangsaan (A) /												
MPW2123/	Bahasa Kebangsaan (B) /												
UALXxxx3	Foreign Language												
MPW2133	Pengajian Malaysia												
MPW2143/	Pengajian Islam / Pendidikan Moral												
MPW2153													
UALE1073	English for Engineering												
UEEG2113	Law for Engineers												
UEME4243	Engineer In Society												\checkmark
UKMM1043	Basic Economics, Accounting and Management		\checkmark				\checkmark		\checkmark		\checkmark		\checkmark
UBMM1011	Sun Zi's Art of War and Business Strategies												
USCC1012	Communication Skills (Oral Communication)												

COs of Courses Mapping to POs

5

		Programme Outcome (PO)											
Course Code	Course Description	1	2	3	4	5	6	7	8	9	10	11	12
USCC1022	Communication Skills (Written Communication)									\checkmark			
USCC1032	Critical Thinking									\checkmark			
USCC1042	Teambuilding and Leadership Skills												
USCC1052	Emotional Intelligence at the Workplace												\checkmark
USCC1062	Professional Ethics and Manners												
USCC1072	Theatre												
USCC1082	Debate												
USCC1092	Martial Arts												
USCC1102	Music												
USCC1112	Dance												
USCC1122	Entrepreneurship												
USCC1132	Language, Culture and Social Study Abroad											\checkmark	
USCC1142	Team Work and Collaborative Project												
USCC1152	Managing Personal Finance												
USCC1172	Sports												
USCC1182	Study Soft Skills and Life Skills Abroad												
USCC1192	Community Service												







Constructive Alignment







Constructive Alignment

						Assessment Task / Question										
No	No CO PO n (C/A/P)	Teaching Methods	Practica I	Assignm ent	Mid- Term Q1	Mid- Term Q2	Mid- Term Q3	Final exam Q1	Final exam Q2	Final exam Q3	Final exam Q4/Q5		ge Weightag e			
1	CO 1	PO1	C1	Lecture, Practical, Tutorial			5%			15%					20%	
2	CO 2	PO1	C2	Lecture, Practical, Tutorial				5%			15%				20%	
3	CO 3	PO2	C4	Lecture, Practical, Tutorial					5%			15%			20%	
4	CO 4	PO4	C3	Lecture, Practical, Tutorial		15%							15%		30%	
5	CO 5	PO5	Р3	Practical	10%										10%	
				Percentage	10%	15%	5%	5%	5%	15%	15%	15%	15%		100.00%	

- Each assessment task / question is mapped to **one CO only**.
- Each CO **must be assessable** and **assessed** in each task that it is aligned with the designed Bloom's Taxonomy level





Bloom's Learning Taxonomy

Cognitive	Affective	Psychomotor
Levels 1-6	Levels 1-5	Levels 1-5
Knowledge-based	Attitude-based	Skills-based
1. Remembering	1. Receiving phenomena	1. Imitating
(recall data)	(aware of phenomena)	(copy as a novice)
2. Understanding	2. Responding	2. Manipulating
(comprehend, explain)	(react to phenomena)	(follow instructions)
3. Applying	3. Valuing	3. Developing precision
(use, practise, apply)	(understand and act)	(perform task)
4. Analysing	Organising personal	4. Articulating
(make sense of structure)	value system	(combine/integrate
	(respond, reflect)	skills)
5. Evaluating	5. Internalising value	5. Naturalising
(assess, judge, compare)	system (<i>adopt</i>	(automate, become
	behaviour as habitual)	expert)
6. Creating		
(synthesise, design, build)		





Example on Industrial Training Assessment

Course Outcomes:

- CO1: apply knowledge of science/engineering fundamentals
- CO2: apply technical skills and modern tools in work place/engineering practice
- CO3: comply with the rules and guidelines relevant to professional/professional engineering practice
- CO4: follow code of ethics and standards of professional conduct
- CO5: demonstrate written and oral communication skills
- CO6: demonstrate the ability to work independently and as part of a team
- CO7: demonstrate life-long learning and self-improvement





Example on Industrial Training Assessment (Cont'd)

Assessment	CO1	CO2	CO3	CO4	CO5	CO 6	CO7	Total Marks
Report & Log Book								45
Oral Presentation								10
Appraisal by Industrial Supervisor								45
CO Percentaage (%)								100





Example on Industrial Training Assessment (Cont'd)

A. Report & Log Book:

Category	Max Mark	Criterion	СО
Details of Industrial	10	 Apply knowledge of science/engineering fundamentals 	CO1
training experience	10	2. Apply technical skills and modern tools in work place/engineering practice	CO2
Presentation of Report	10	1. Logical and coherent report layout and content follow the format of IT guideline and template. Legible report with proper grammar and terms.	CO5
Log Pook	10	1. Demonstrate life-long learning and self- improvement	CO7
LUg DUUK	5	2. Quality and Usage of Logbook in recording works and events	CO5





Example on Industrial Training Assessment (Cont'd)

B. Oral Presentation:

Category	Max Mark	Criterion	
	5	1. Presentation skill and style such as clarity and logical flow, eye contact and effectively use of visual aid.	CO5
Oral Presentation	5	2. Presentation content on background introduction, working experience, discussions and conclusions.	CO5
	5	3. Q & A on the ability to answer questions.	CO5

Final Scale of 10 Marks





Example on Industrial Training Assessment (Cont'd)

C. Industrial Supervisor Appraisal:

Category	Max Mark	Criterion	
	5	1.Apply knowledge of science/engineering fundamentals.	CO1
	5	2.Apply technical skills and modern tools in work place/engineering practice	CO2
Appraisal by Industrial	5	3. Comply with the rules and guidelines that are relevant to professional/professional engineering practice.	CO3
	5	4. Follow code of ethics and standards of professional conduct.	CO4
Supervisor	5	5. Demonstrate written and oral communication skills.	CO5
	10	6. Demonstrate the ability to work independently and as part of a team.	CO6
	10	7. Demonstrate life-long learning and self-improvement	CO7
Total Max Mark	45		







Final Year Project Poster Competition & & Industry Interaction Day



Explore the outstanding undergraduate research & exciting innovation!

Interact with industries to discover career pathways!




Final Year Project (FYP)

- Pre-requisite: at least 90 credit hours, completed at least 6 long trimesters
- 8 credit hours, 2 long trimesters (Part 1 and Part 2)
- Stakeholders involved:
 - ≻Student
 - Supervisor & Co-supervisor : to supervise and assess student's performance
 - ➤ 3rd Academic Staff: as moderator to assess student's performance through report and presentation
 - FYP Coordinator : to monitor and assist student Industry: to provide co-supervision, poster judging





Expected Outcomes of FYP

CO1: Apply knowledge of engineering fundamentals in complex problem solving

CO2: Analyze complex engineering problems with suitable problem identification

CO3: Propose solution for complex engineering problems

CO4: Investigate complex engineering problems with appropriate conclusions

CO5: Comply with ethical guidelines

CO6: Demonstrate oral and written communication skills

CO7: Involve in activities stimulating lifelong learning

CO8: Demonstrate competence in managing engineering projects

PO1: Engineering Knowledge

PO2: Problem Analysis

PO3: Design/Development of Solutions

PO4: Investigation

PO8: Ethics

PO9: Communication

PO11: Life-long Learning

PO12: Project Management and Finance







Assessment	Weight	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8
Progress report	15%	20%	16%	8%		8%	24%	12%	12%
Oral Presentation 1	5%						100%		
General Effort 1	5%		24%			16%		32%	28%
Final Report	45%	4%	4%	16%	28%	12%	24%	8%	4%
Oral Presentation 2 / Demonstration	15%			32%			68%		
General Effort 2	10%		20%	28%		12%		24%	16%
Poster Submission	5%							100%	



Universiti Tunku Abdul Rahman Lee Kong Chian Faculty of Engineering and Science Final Year Project

MARKS DISTRIBUTION

Supervisor/Moderator Allocation

Assessments	Supe	rvisor*	Mode	rator 1	TOTAL		
Progress Report	15	100%			15%	r 1	
Oral Presentation 1	1.05	21%	3.95	79%	5%	neste	25%
General Effort 1*	5	100%			5%	Trir	
Final Report	10.8	24%	34.2	76%	45%		
Oral Presentation 2 / Demonstration	3.15	21%	11.85	79%	15% N 15%	75%	
General Effort 2*	10	100%			10%	rime	13%
Poster Submission*	5	100%			5%		
% Contribution	5	0*	5	0	100%		
					50		
Project Reports	60%						
Presentations	25%						
General Effort	15%						
	100%						

*Co-Supervisor Assessment - Poster Submission and 50% of General Effort 1 and 2 are marked by the co-supervisor (if applicable)

Course Outcome Distribution

Assessments	CO1	CO2	CO3	CO4	CO5	CO6	C07	CO8	TOTAL		
Progress Report	3.0%	2.4%	1.2%		1.2%	3.6%	1.8%	1.8%	15%	Ľ1	
Oral Presentation 1						5.0%			5%	neste	25%
General Effort 1		1.2%			0.8%		1.6%	1.4%	5%	Tri	
Final Report	1.8%	1.8%	7.2%	12.6%	5.4%	10.8%	3.6%	1.8%	45%		
Oral Presentation 2 / Demonstration			4.8%			10.2%			15%	ster 2	75%
General Effort 2		2.0%	2.8%		1.2%		2.4%	1.6%	10%	Lime	1378
Poster Submission							5.0%		5%	[
% Contribution	4.8%	7.4%	16.0%	12.6%	8.6%	29.6%	14.4%	6.6%	100%		





FYP Assessment: **Progress report**

15			1	Progress Rep	ort	
16		Maxi Ma	imum rks*	Criteria	Supervisor Assessment (0 to 5)	Supervisor Marks*
17	tion		4	Identification of the problem		0
18	oduc	16	8	Definition of aims and objectives		0
19	Intro		4	Overview of project		0
20			12	Review of research topic		0
21	ature riew	40	12	Analytical and Critical thinking		0
22	Rev	40	12	Structure and coherence of literature review		0
23			12	References		0
24	ology ect ment		8	Methodology of the project**		0
25	Methodo & Proj Manage	20	12	Planning and managing of project activities		0
26	oort ality	16	8	Language: grammar and style		0
27	Rep Qua	10	8	Citation of various sources		0
28			0			

- 11 criteria mapped to 7 different COs (1, 2, 3, 5, 6, 7, & 8)
- Assessed by the Supervisor





FYP Assessment: Oral Presentation Part 1

32								
33				Oral Presentation	Part 1			
34		Maxi Mar	mum 'ks*	Criteria	Supervisor Assessment (0 to 5)	Supervisor Marks*	Moderator Assessment (0 to 5)	Moderator Marks*
35	itation Style	52	20	Structure and attractiveness of presentation		0		0
36	esen kill 8	52	16	Preparedness and confidence		0		0
37	P		16	Use of presentation tools and visual aids		0		0
38	٤A	24 Quality of provided answers		Quality of provided answers		0		0
39	õ	48 2	24	Attitude and composure		0		0
40						0		0
41							•	

- 5 criteria mapped to CO6
- Assessed by the Supervisor and Moderator





FYP Assessment: General Effort Part 1

15		General Effort P	art 1		
16	Maximum Marks*	Criteria	Supervisor Assessment (0 to 5)	Co-Supervisor Assessment (0 to 5)**	Combined Marks*
17	24	Problem identification and analysis			0
18	28	Selection and implementation of research methodology and management			0
19	16	Compliance with FYP policies/guidelines and ethical norms			0
20	16	Discipline and regular reporting			0
21	16	Personal development/life long learning activities			0
22					0

• 5 criteria mapped to CO2, 5, 7, 8

• Assessed by the Supervisor and Co-Supervisor (if any)



FYPAssessment: Final report



15				Final Repor	t			
16		Maxi Mar	mum ˈks*	Criteria	Supervisor Assessment (0 to 5)	Supervisor Marks*	Moderator Assessment (0 to 5)	Moderator Marks*
17	Abs- trac t	4	4	Overview of the project		0		0
18	Intro- ductio n	4	4	Problem identification and formulation of project aims and objectives		0		0
19			4	Review of research topic		0		0
20	0 5 16 4 Critical Investigation			0		0		
21	Litera Rev	4 Structure and coherence of literature review			0		0	
22	22 4 References				0		0	
23	يد مج	z 4 Methodology of the project**			0		0	
24	dology roject igemer	16	4	Planning and managing of project activities		0		0
25	Metho Pı Mana		8	Problem solving		0		0
26			12	Analysis and interpretation of results		0		0
27	lts & sions		12	Solution to a complex problem		0		0
28	Resu	44	12	Presentation and explanation of results		0		0
29			8	Reproducibility/reliability of results		0		0
30	sion & men- ons	4 Address research question and achievement of aims and objectives		Address research question and achievement of aims and objectives		0		0
31	Conclus Recom datic	Analysis of limitations and recommendations for future development			0		0	
32	lity	0	4 Language: grammar and style			0		0
33	3 2 3 4 Citation of various sources					0		0
34						0		0

• 17 criteria mapped to 8 CO's; Assessed by the Supervisor and Moderator





FYP Assessment: Oral Presentation Part 2

39				Oral Presentation	Part 2			
40		Maxi Mar	mum 'ks*	Criteria	Supervisor Assessment (0 to 5)	Supervisor Marks*	Moderator Assessment (0 to 5)	Moderator Marks*
41	lation Style		12	Structure and attractiveness of presentation		0		0
42	esent ill &	36 12		Preparedness and confidence		0		0
43	Pre Sk		12	Use of presentation tools and visual aids		0		0
44	nical tent / stration	20	16	Problem solution(s)***		0		0
45	Tech Cont Demon	32	16	Demonstration of problem solution(s)***		0		0
46	۶A	16 Quality of provided answers		Quality of provided answers		0		0
47	32 16 Attitude and composure			0		0		
48						0		0

- 7 criteria mapped to CO3, and CO6
- Assessed by the Supervisor and Moderator





FYP Assessment: General Effort Part 2

20												
27		General Effort P	art 2									
28	Maximum Marks*	Criteria	Supervisor Assessment (0 to 5)	Co-Supervisor Assessment (0 to 5)**	Combined Marks*							
29	28	Proposal of solution to a complex problem			0							
30	16	Selection and implementation of research methodology and management			0							
31	20	Problem identification and analysis			0							
32	12	Compliance with FYP policies/guidelines and ethical norms			0							
33	12	Discipline and regular reporting			0							
34	12	Personal development/life long learning activities			0							
35					0							

- 6 criteria mapped to CO2, 5, 3, 7, & 8
- Assessed by the Supervisor and Co-supervisor



FYP Assessment: Poster Submission



-		0			3	IN IN	L	141	14
30	Criteria	Excellent	Good	Moderate	Weak	Poor	Weight	Marks	Review Panel Adjustment
31		Overal	Poster De	esign/Appe	arance				
20	1. The poster is attractive in terms of design, layout, and neatness						10	0	
32	2. Graphics (e.g. tables, figures, etc.) are engaging and enhance the text.						4	0	
34	3. Uses font sizes/variations which facilitate the organization, presentation, and readability of the research.						6	0	
35	4. Overall visually appealing, not cluttered; colours and patterns enhance readability.						10	0	
36		Overa	ll Poster T	echnical Co	ontent				
37	5. Title highlights the poster's subject matter.						6	0	
38	6. Abstract provides a clear overview.						8	0	
39	7. Objective(s) explained clearly.						6	0	
40	8. Method clearly stated.						10	0	
41	 The intended information is conveyed through the appropriate use of equations, tables, graphics, and visuals. 						8	0	
42	10. Content is clearly arranged so that the viewer can understand order without narration.						6	0	
43		sage							
44	11. There are no mistakes on the poster.						10	0	
45	12. The grammar is fine.						8	0	
46	13. No obvious spelling mistakes.						8	0	
47						Total	(100%)	0	0

• 13 criteria mapped to CO7; Assessed by Supervisor and Co-Supervisor







- The report is free from spelling and grammatical errors (No obvious lapses in punctuation / grammar / spelling)
- The report is free from formatting and referencing errors (Report format is always consistent including heading styles, fonts, margins, blank space, captions, etc.)
- The report is well structured and well written
- Comments are addressed appropriately
- Errors are corrected



Universiti Tunku Abdul Rahman Lee Kong Chian Faculty of Engineering and Science Final Year Project

Marking Rubrics

							Pre	ogress Report			
		Maxir Mar	num ks	Criteria	со	Unacceptable {0)	Poor (1)	Marginal (2)	Average (3)	Good (4)	Excellent (5)
			4	Identification of the problem	2	Problem area not discussed	Poor description of problem area	Problem area is quite clearly stated	Problem area is correctly identified, well formulated	Problem area is explicitly identified, described and analyzed	Problem area is very clearly stated, analyzed in depth, covering dependencies and inter- relationships with other problems
Introduction		16	8	Definition of aims and objectives	1	Aims and objectives not provided	Unclear or vague aims and objectives provided	General aims and objectives provided	General aims and objectives are well defined	Specific aims and objectives are clearly formulated and obviously derived from the provided introductory section	Specific aims and objectives, which are obviously and unquestionably derived from the identified problem area in introductory section, are explicitly and clearly defined
			4	Overview of project	6	Not provided	Overview is provided which is hard to understand or lacking important details	Overview lacks important details in some areas	A simple and clear overview of the project	Detailed, clearly written and structured project overview	Project overview of exemplary structure with clear coverage of all relevant aspects
			12	Review of research topic	1	No review of research topic	Poor review of very few sources which is off topic	Limited review with few sources or a review which is partly off topic	Sufficient review with mostly relevant and reliable sources	Adequate review with closely relevant, reliable and reputable sources	A comprehensive review covering a large number of relevant sources which are well linked and described in relation to the project scope

Rubrics is provided to guide students in fulfilling specified course outcomes & to assist lecturers to evaluate student performance in achieving each course outcome



FYP Special Case Review



	A				-			0			J J
1	4000			Universit	ti Tunku A	bdul Rahma	en 👘				
2			Lee	Kong Chian Fa	culty of E	ngineering a	and Scie	ence			
3				E	inal Year I	Project					
4	Who is extended to the Helicopic site of address To the Consider										
5	R6 2 (201)	FINA	L YEAR	PROJECT	r spec	CAL CA	SE RE	EVIEW F	ORM		
6 7	Acadomia Sacalan		201601 2	01605							
, o	Brogramma		201001-2	01003							
<u> </u>	Programme	•									
9	Student Name : A UTAR STUDENT										
10	Student ID : 9999999										
	Supervisor	:	Supervisor	Chong				Co-Supervis	orlan		
12	Moderator : Moderator Lim										
13	Project Title : An interesting and useful project with high societal value										
14									Marks/Gra	de awarded	
15	Moderation for	:						FYP Marking Scheme		Review Panel	Pre-BOE
16			Write the specific	c case for moderation				C	%		
17	Documents-A: Mandatory Doc	uments for ALL	cases (if existi	ng)							
18	No.			Doe	cuments				Act	tion By	Please Check (✔)
19	1	Marking Sch	eme						FYP C	oordinator	
20	2	Log Book							FYP C	oordinator	
21	3	TURNITIN - O	Originality R	eport				FYP Coordinator			
22	4	Supervisor's	Comment of	n Originality Re	eport				FYP Coordinator		
23	5	Supervisor's	Comments	- /	-				FYP S	Supervisor	
	START-StudentList Summary	Comments F	Part 1 Part 2	General Effort	Poster	Marking Rubric	s Distri	ibution COA	chievement	Special Case Re	view Form

- Special cases include A+/A/A-, 10 marks difference in assessment between supervisor and moderator, similarity in Turnitin Report, Late/Incomplete/Non submission, withdrawal
- All special cases will be reviewed by the Departmental and Faculty Level Review Panel



CO Attainment Report

Reports

Campus	:	Sungai Long
Faculty	:	LEE KONG CHIAN FACULTY OF ENGINEERING AND SCIENCE
Level	:	Bachelor
Trimester	:	202005
Programme	:	All
Course	:	UEGE4116 - PROJECT

AVERAGE OF CO/CLO ACHIEVEMENT



• COs Achievement by a particular student is shown

• Overall Performance of All Students taking FYP is also provided







Complex Engineering Problems

	<i>Complex Engineering Problems</i> have characteristic WP1 and some or all of WP2 to WP7:
Depth of Knowledge Required	WP1: Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamentals-based , first principles analytical approach
Range of conflicting requirements	WP2: Involve wide-ranging and/or conflicting technical, non-technical issues (such as ethical, sustainability, legal, political, economic, societal) and consideration of future requirements
Depth of analysis required	WP3: Have no obvious solution and require abstract thinking, creativity and originality in analysis to formulate suitable models
Familiarity of issues	WP4: Involve infrequently encountered issues or novel problems
Extent of applicable codes	WP5: Address problems not encompassed by standards and codes of practice for professional engineering





Complex Engineering Problems

	<i>Complex Engineering Problems</i> have characteristic WP1 and some or all of WP2 to WP7:
Extent of stakeholder involvement and conflicting requirements	WP6: Involve collaboration across engineering disciplines , other fields, and/or diverse groups of stakeholders with widely varying needs
Interdependence	WP7: Address high level problems with many components or sub-problems that may require a systems approach

Require Judgement in Making Decision, which has significant consequences to society and the environment in a range of contexts

"Graduate Attributes and Professional Competencies" published by the International Engineering Alliance which are also adopted by FEIAP (https://www.ieagreements.org)



Engineering Activities



	Attributes	Complex Activities
1	Preamble	Complex activities means (<i>engineering</i>) activities or projects that have some or all of the following characteristics:
2	Range of resources	EA1: Involve the use of diverse resources including people, data and information, natural, financial and physical resources and appropriate technologies including analytical and/or design software
3	Level of interactions	EA2: Require optimal resolution of interactions between wide- ranging and/or conflicting technical, non-technical, and engineering issues
4	Innovation	EA3: Involve creative use of engineering principles, innovative solutions for a conscious purpose, and research- based knowledge
5	Consequences to society and the environment	EA4: Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation
6	Familiarity	EA5: Can extend beyond previous experiences by applying principles-based approaches

FEIAP (https://www.ieagreements.org)





Complex Engineering Problem and Activities for FYP

- A FYP usually requires students to use the knowledge gained from different courses and expects students to extend the depth of knowledge and develop their abilities in using advanced technique(s) to design a system or to enhance the performance of the system
- The students are also expected to use diverse resources to demonstrate their research competence in the literature review, methodology, design, implementation, and testing of their work
- To ensure that the FYP covers the required Complex Problem Solving and Complex Engineering Activities, the proposed FYP titles undergo a vetting process at the Departmental Level by the respective Curriculum Development Committee members





Complex Problem Solving (CPS) 1/4

1		Assessment for Complex Engin	eering Prob	lem Solving (CPS)
2				
3	Course Code:	<u>UEGE4116</u>		
4	Name of Course:	Project		
7				
8	Attribute	Complex Engineering Problems have characteristic WP1 and some or all of WP2 to WP7:	Tick which attribute is assessed (WP1 is mandatory)	Comments from Course Coordinator / Teaching Team (give examples / clarifications)
9	Depth of Knowledge Required	WP1: Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamentals-based, first principles analytical approach	V	Marking rubrics for Final Report: Review of research topic Problem identification and formulation of project aims and objectives Solution to a complex problem Analysis and interpretation of results Marking rubrics for Progress Report: Definition of aims and objectives Analytical and Critical thinking Clarifications: FYP involves the application of knowledge of different courses. In addition, students are expected to extend the depth of knowledge and perform comprehensive review to identify the problem, formulate, and develop a suitable solution .





10	Range of conflicting requirements	WP2: Involve wide-ranging or conflicting technical, engineering and other issues	V	Marking rubrics for Final Report: Solution to a complex problem Marking rubrics for GE2: Proposal of solution to a complex problem Clarifications: As the FYP is mainly of open-ended type and the solution requires a high level of research and creativity, the students will face a wide range of conflicting issues. This usually leads to interdependence of various issues that arise during the execution of a project.
	Depth of analysis required	WP3: Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	V	Marking rubrics for Final Report: Analysis and interpretation of results Solution to a complex problem Address research question and achievement of aims and objectives Analysis of limitations and recommendations for future development Marking rubrics for GE1 and GE2: Problem identification and analysis Clarifications: As the FYP is mainly of open-ended type and the solution requires a high level of research and creativity, the students will face a wide range of conflicting issues. This usually leads to interdependence of various issues that arise during the execution of a project. In-depth analysis and investigation on a given problem are required to propose an open-ended solution to meet the project objective.



Complex Problem Solving (CPS) 3/4





Complex Problem Solving (CPS) 4/4



Complex Engineering Activities (CEA) 1/2

5



1		Assessment for Complex Engineering Activities (CEA)												
2														
3	Course Code:	<u>UEGE4116</u>												
4	Name of Course:	<u>Project</u>												
7														
8	Attribute	Complex activities mean (engineering) activities or projects that have some or all of the following characteristics:	Tick which attribute is assessed	Comments from Course Coordinator / Teaching Team (give examples / clarifications)										
9	Range of Resources	EA1: Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies).	V	Marking rubrics for Final report: Planning and managing of project activities Marking rubrics for OP1 and OP2: Use of presentation tools and visual aids Project involves the design of a solution for a specific problem. Students need to properly plan and manage the project activities which include purchasing of materials, communicating with suppliers, allocation of equipment, time and cost to complete the project and make effective presentations.										
10	Level of Interactions	EA2: Require resolution of significant problems arising from interactions between wide ranging or conflicting technical, engineering or other issues.	٧	Marking rubrics for Final report: Solution to a complex problem As the FYP is mainly of open ended type and the solution requires a high level of research and creativity, the students will face a wide range of conflicting issues. This usually leads to interdependence of various issues that arise during execution of a project.										





10	Level of Interactions	EA2: Require resolution of significant problems arising from interactions between wide ranging or conflicting technical, engineering or other issues.	٧	Marking rubrics for Final report: Solution to a complex problem As the FYP is mainly of open ended type and the solution requires a high level of research and creativity, the students will face a wide range of conflicting issues. This usually leads to interdependence of various issues that arise during execution of a project.
11	Innovation	EA3: Involve creative use of engineering principles and research- based knowledge in novel.	٧	Marking rubrics for Final report: Problem solving and Solution to a complex problem The FYP is mainly open ended type and requires creative thinking. Student needs to come up with an innovative and optimum solution to a particular problem based on engineering principles and research knowledge.
12	Consequences to Society and the Environment	EA4: Have significant consequences in a range of contexts, characterised by difficulty of prediction and mitigation.	٧	Marking rubrics for Final report: Critical investigation Students have to consider and discuss the impact of the project on society and environment and ensure that the proposed solution can minimize the impact.
13	Familiarity	EA5: Can extend beyond previous experiences by applying principles-based approaches.	V	Marking rubrics for Final report: Review of research topic and Critical investigation As most of the FYP titles are usually proposed by the faculty members or industry partners, the topics are beyond the level of undergraduate studies and the students are exposed to unfamiliar issues. The students need to do a comprehensive review covering a large number of relevant sources and are expected to apply appropriate standards consistently in every stage of the project.





Examples of FYP Titles (Electrical and Electronics Engineering)

- Application of Machine Learning in Smart Home System
- Wireless Charging Method by Using Flexible Solar PV
- Modeling and Analysis of Flywheel Energy Storage on Power Grid with PV systems
- Microwave Photonic Filter based on Multiwavelength Fiber Laser
- Development and Optimization of Wireless Charging System for Electric Vehicle
- Performance of Stacked-panels Water-Cooled PV system
- IoT based Health Monitoring System
- Application of AI in Digital Home
- Suitability Exploration of Gravity Energy Storage Hydroelectric Projects





Examples of FYP Titles (Communications)

- Application of Machine Learning in Lift Component Identification
- System Design of Student Profiling using Big Data Analytics and Machine Learning
- Design of a Predictive Model for TCM Tongue Diagnosis in Malaysia Using Machine Learning
- Performance Study of IoT Connectivity: LORA Network
- Design of DVB-T2 Transmitter/Receiver Simulink Model with 32 K subcarriers and 256 QAM constellation
- Performance Analysis of BPSK Simulink model in AWGN , Rician and Rayleigh Channels
- Performance Study of 5G Communications





Example of FYP Titles (Chemical Engineering)

- Green synthesis of biomass derived photocatalyst for green production of biodiesel using waste oil
- Development and kinetic studies of biosorbent for heavy metals removal
- Development and characterization studies of green nanocatalyst for biodiesel production
- The roles of higher education in tackling climate change in line with Sustainable Development Goals
- Investigation the feasibility of using black solider manure in agriculture activities
- Removal of Heavy Metal Using Magnetic Biochar Crosslinking with Biopolymers
- Synthesis of polymer coated iron oxide for the disinfection of bacteria
- Optimisation of Industry 4.0 implementation strategy for oil palm industry





Example of FYP Titles (Civil Engineering)

- Bio-mediation in tropical residual soil by surface percolation method
- Water Quality Parameter Analysis for the Feasibility of Black Tiger Shrimp, Penaeus monodon Culture
- Analysis of Rainfall Temporal Pattern and Spatial Distribution for Sabah & Sarawak
- Radionic Elastic Wave based Concrete Surface Crack Assessment
- Construction Noise Prediction on the Earth-Moving Activities
- Acoustic properties of lightweight foamed concrete with 25% ceramic tile dust as cement replacement material
- Ductility of Low Rise Reinforced Concrete Building with and without Viscous Dampers under Cyclic Loadings
- Fire Resistance of Lightweight Foam Concrete Incorporating of Intumescent Coated Oil Palm Shell Aggregate
- Thermal And Strength Properties of Lightweight Foam Concrete Reinforced with Single Polypropylene Fibre
- Structural Seismic Energy Dissipation of Low Rise Reinforced Concrete School Building





Example of FYP Titles (Mechanical Engineering)

- Development of concrete/rubber composite rail sleeper
- Microstructural analysis and mechanical testing of aluminium castings
- Investigation on media pack configurations for air filtration devices
- Investigation of the friction stir welding using aluminium alloy
- Development of Bio Composite for telecommunication pole construction
- Improve miniacture co-extrusion extruder for 3D printer
- Develop a real time stress detector with electromyogram
- Study of 3D metal printing of high carbon steel with the use of metal liquid mixture method
- Design and Development of Thermoacoustics Refrigerator
- Study of round mechanical clinching joint strength of hybrid sheet metals





Example of FYP Titles (Mechatronics Engineering)

- Implementation of machine vision on service robot
- Implementation of speech-based control for robot
- XY stage error compensation for pick and place system
- Motion planner for 5 DOF robotic arm on a moving platform
- Development of fall risk clustering algorithm in older people
- Design and development of Smart Home Web Interface
- Energy usage monitoring system with automated wall socket
- Development of an instrumented swim arm pedal for movement monitoring
- Noisy and incomplete fingerprint reconstruction system
- Household Waste Segregation Using Intelligent Vision System





UTAR OBE System (eOBE)

- Electronic OBE (eOBE) is used to measure Course Outcomes (CO) Achievement and thus measure the Programme Outcomes (PO) Achievement.
- The Department has the mapping of CO-PO for all courses (especially technical courses) for a programme.
- eOBE allows the course coordinator to monitor the course easily. If the achievement is not satisfactory (e.g. below 50%), the course coordinator can do continual quality improvement (CQI).



•



eOBE Comprise of THREE parts as follows:



- CO Descriptions and Bloom's Taxonomy Level
- CO-PO Mapping
 - **Part II: Assessment Configuration**
- Assessment Settings (Continuous Assessment and Final Examination)
- Assessment-CO Mapping

Part III: Student Marks Entry

Student Marks



Maintain Assessment





eOBE (Part I: Course Configuration)

UEEA 1313 Basic Electronics

Course Learning Outcomes (CO/CLO)

Course Learning Outcomes (CO/CLO)	CO/CLO Descriptions	Teaching Method (Max 3 choices)
CO/CLO 1	Explain the operation of diode through circuit applications.	Lecture,Practical,Tutorial
CO/CLO 2	Determine biasing circuit parameters for transistor	Lecture,Practical,Tutorial
CO/CLO 3	Analyze DC and AC parameters of transistor amplifiers	Lecture,Practical,Tutorial
CO/CLO 4	Demonstrate the use of transistors and operational amplifiers for analog circuits	Lecture,Practical,Tutorial
CO/CLO 5	Present ethical responsibilities in report writing	Practical





eOBE: Part I: Course Configuration

UEEA 1313 Basic Electronics

CO/CLO to PO/PLO Mapping

SL-LKCFES-Bachelor-FT-3E-201805-Ver. 01

	PO/PLO 1	PO/PLO 2	PO/PLO 3	PO/PLO 4	PO/PLO 5	PO/PLO 6	PO/PLO 7	PO/PLO 8	PO/PLO 9	PO/PLO 10	PO/PLO 11	PO/PLO 12	Taxonomy Level
CO/CLO 1	•												C2. Understanding
CO/CLO 2	•												C2. Understanding
CO/CLO 3		•											C4. Analysing
CO/CLO 4	•												C2. Understanding
CO/CLO 5								•					A2. Responds to Phenomena





eOBE (Part II: Assessment Configuration: UEEA 1313 Basic Electronics

Asses	sment											
Final Exam 6			0%									
No.	Question	Full Marks		% to Final	(60%)	6) Group		Answer "X"		out of "Y" Questions		
1	Q4	2	5.0000		15.0000	1			1			2
2	Q5	2	5.0000		15.0000	1			1			2
3	Q1	2	5.0000		15.0000			1				1
4	Q2	2	5.0000		15.0000				1			1
5	Q3	2	5.0000		15.0000				1			1
Coursewo	ork	4	0%									
No.	Assessment Metho	d	Full Ma	arks	% to Final (40%)		Group)	Answer "X"		out of "Y" Questions	
1	TEST Q1			15.0000	15.0000		7.5000					1
2	TESTQ2			15.0000		7.5000						1
3	ASSIGNMENT P1			3.0000	000		6.0000					1
4	ASSIGNMENT P2			2.0000		4.0000				1		1
5	LAB REPORT 1			100.0000		5.0000				1		1
6	LAB REPORT 2			100.0000	00.0000					1		1
7	LAB REPORT 3		100.0000	100.0000					1		1	
Practical		N	/A									
No. Assessment Method		Ful	Marks	% to Final	Group		Ar	Answer "X"		out of "Y" Questions		

No Record Found





eOBE (Part II: Assessment Configuration) (Cont'd) UEEA 1313 Basic Electronics

AQ to CO/CLO Mapping

Assessment Name	Coursewor	k				Final Exam						
Question Description	TEST Q1	TESTQ2	ASSIG	ASSIG	LAB RE	lab re	LAB RE	Q1	Q2	Q3	Q4	Q5
Question Group											Group 1	Group 1
Require Answer	1	1	1	1	1	1	1	1	1	1	1	1
CO/CLO 1	v				v			v				
CO/CLO 2		×				*			×			
CO/CLO 3			×							×		
CO/CLO 4							×				*	•
CO/CLO 5				~								


eOBE (Part III: Student Marks Entry)



No	Student ID	Student Name	Continuous Assessment Marks								
			TEST	TEST	ASSIGNMENT	ASSIGNMENT	LAB REPORT	LAB REPORT	LAB REPORT		
			Q1	Q2	P1	P2	1	2	3		
		% to final	7.50%	7.50%	6.00%	4.00%	5.00%	5.00%	5.00%		
		Full Marks	15	15	3	2	100	100	100		
		Average	11.75	14.13	2.37	1.64	95.13	78.25	80.25		
1	1603602	CHONG WOON SHING	12	13.5	1.92	1.4	92	67	76		
2	1700625	TAN WEI KUN	13	15	2.76	1.84	100	76	82		
3	1800503	GOO CHING WEI	12	13	2.58	1.8	96.5	87	82		
4	1804715	LIM YUEH SHENG	10	15	2.22	1.52	92	83	81		

No	Student Index	Final Exam Marks					
		Q1	Q2	Q3	Q4	Q5	
	% to final	15.00%	15.00%	15.00%	15.00%	15.00%	
	Full Marks	25	25	25	25	25	
	Average	20-75	16.75	21.5	20.25	0	
1	U06792EBECF	22	16	23	21	NA	
2	U06812EBECF	19	16	21	21	NA	
3	U06856EBECF	22	15	20	20	NA	
4	U06865EBECF	20	20	22	19	NA	





eOBE (CO Attainment)

• CO 1: Test Q1, Lab Report 1 and Final Exam Q1

• CO 1 Attainment =
$$\frac{\frac{12}{15} \times 7.5\% + \frac{92}{100} \times 5\% + \frac{22}{25} \times 15\%}{7.5\% + 5\% + 15\%}$$

= 86.55%

Student	C001	C002	CO03	C004	CO05
1603602- CHONG WOON SHING	86.55	71.64	84.00	82.00	70.00
1700625- TAN WEI KUN	85.45	84.73	89.14	77.50	92.00
1800503- GOO CHING WEI	87.36	72.18	81.71	80.50	90.00
1804715- LIM YUEH SHENG	76.36	77.27	81.14	83.25	76.00



CO Achievement

AVERAGE OF CO/CLO ACHIEVEMENT



Student	C001	C002	CO03	C004	C005	
1603602- CHONG WOON SHING	86.55	71.64	84.00	82.00	70.00	
1700625- TAN WEI KUN	85.45	84.73	89.14	77.50	92.00	
1800503- GOO CHING WEI	87.36	72.18	81.71	80.50	90.00	
1804715- LIM YUEH SHENG	70.00	77.27	81.14	83.25	76.00	
AVERAGE OF CO/CLO ACHIEVEMENT	83.93	76.45	84.00	80.81	82.00	

Average of CO 1 Attainment = (86.55+85.45+87.36+76.36) / 4 = 83.93 %





PO Achievement (is measured averagely through mapped CO)

For example:





PO Achievement





PO Achievement = Average of PO Achievement from Corresponding Courses

PO Achievement is analyzed in Annual Programme Monitoring Report for CQI.



PO Achievement



Course	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
UECM1653 - MATHEMATICS FOR ENGINEERING I	71.67											
UECM1723 - MATHEMATICAL TECHNIQUES FOR ENGINEERING	67.85	60.96										
UEEA1243 - CIRCUIT THEORY	24.00	77.50			96.50			60.00				
UEEA2543 - PRINCIPLES OF COMMUNICATION SYSTEMS	72.17	72.87	62.91									
UEEA3343 - SOLAR CELL TECHNOLOGY	95.00	68.22	54.40	23.00								
UEET2523 - DIGITAL COMMUNICATIONS	40.55	20.00	59.96									
UEGE3114 - INDUSTRIAL TRAINING	82.08				84.59	89.18		91.80	78.49	90.16	85.41	
UEME4253 - PROJECT MANAGEMENT	62.25		67.99				73.36					63.85
MPU34072 - ART, CRAFT, AND DESIGN		76.67	63.00		76.00				75.00			
MPU34152 - LEADERSHIP AND TEAMBUILDING		74.44							73.89			
MPU3113 - HUBUNGAN ETNIK (FOR LOCAL STUDENTS)			52.25	83.33								
MPU34042 - LANGUAGE, CULTURE AND SOCIAL STUDY ABROAD				78.75	57.50	85.00						
UKMM1011 - SUN ZI'S ART OF WAR AND BUSINESS STRATEGIES						68.98	67.49					
UALJ2013 - INTRODUCTION TO JAPANESE							73.78	83.00	72.63			
MPU3123 - TAMADUN ISLAM DAN TAMADUN ASIA (TITAS)								57.96	68.96			
MPU34032 - COMMUNITY PROJECT								76.25	60.00		63.06	
MPU32013 - BAHASA KEBANGSAAN A									67.50	67.51		
MPU34022 - ARTS AND CULTURAL PERFORMANCE									70.59	74.35	63.80	
MPU34082 - ORAL COMMUNICATION									60.00	65.42		
UALB1003 - INTRODUCTION TO GERMAN LANGUAGE									64.88			
UALF1003 - INTRODUCTION TO FRENCH									50.45			
UJLL1093 - INTRODUCTION TO KOREAN									63.02			
UKMM1043 - BASIC ECONOMICS, ACCOUNTING AND												64.33

MANAGEMENT





Example of Assessment of PEO via Alumni Survey



PEO Assessment Indicator



PEO	Domain	Performance Indicator	Achievement Criteria	Performance Target
PEO 1	Technical Competence	 Functional Position Annual Income Number of Project Involved 	A scale of 1 -5 is	50%
PEO 2	 Communication Leadership 	 Recognition for communication proficiency Position in an engineering project involved 	used for evaluation of each performance indicator. The achievement percentage is calculated based	1) 60% 2) 30%
PEO 3	Professionalism / Lifelong Learning	 Professional membership Postgraduate degree Professional / technical development 	on average score over maximum score of 5.	50%







UNIVERSITI TUNKU ABDUL RAHMAN

Form Title: SURVEY ON ALUMNI: ENGINEERING PROGRAM OBJECTIVES

Form No: FM-DARP(AlumniSur/FES)-002 Rev No: 2 Effective Date: Page No: 1 of 2

Universiti Tunku Abdul Rahman, Sungai Long Campus, Jalan Sungai Long, Bandar Sungai Long, Cheras 43000, Kajang, Selangorr. Tel: 03-603 9086 0288, Fax: 603 9019 8868

The survey is conducted to track the professional career growth and other accomplishments of UTAR Alumni. The university recognizes the importance of our graduates in helping us in this endeavour. Kindly take a few minutes to complete the survey. The results of the survey will be reported only in the form of summary and your individual responses will be kept confidential.

Personal Particulars:

Gender: Female Male Age: Place of Current Residence (country/state/city/town):	Month & Year of Graduation:
Name of Bachelor Degree Programme at UTAR:	Bachelor of Engineering (Hons) Chemical Engineering
Does your current work relate to :	





PEO Survey (Cont'd)

UNIVERSITI TUNKU ABDUL RAHMAN										
Form Title: SURVEY ON ALUMNI: ENGINEERING PROGRAM OBJECTIVES										
Form No: FM-DARP(AlumniSur/FES)-002	Rev No: 2	Effective Date:	Page No: 1 of 2							
Section I: TECHNICAL COMPETENCE Please (\) tick appropriate option										
Company Name:										
Company Address: (Eg: Jalan Sungai Long, Bandar Sungai Long Cheras 430	000, Kajang, S e lan	igor)								
Company Website: (Eg: www.utar.edu.my)										
Company Contact Number:										
Current occupation / position: (Engineer/Sales/Executive etc)										
Which of the following best describes your lev	el at a compar	IV?								
Principal Engineer Staff/ Senior Engineer	Engineer	☐ Junior [Engineer	Technical Officer							
What is your annual income?										
RM80,001 RM70,001 - RM80,000	RM50,001 70,000	- RM RM40,001 - RM50,000	□ less than RM40,000							
Number of project/design/system/patent involv	ved by you or y	∕our team □ 1	0							





PEO Survey (Cont'd)





PEO Survey (Cont'd)



UNIVERSITI TUNKU ABDUL RAHMAN

Form Title: SURVEY ON ALUMNI: ENGINEERING PROGRAM OBJECTIVES

Form No: FM-DARP(AlumniSur/FES)-002 Rev No: 2

Effective Date:

Page No: 1 of 2

Section III: PROFESSIONALISM / ETHICS

1.0	Are you a member of a Professional Body	/ or Learned Society?
🔲 lf	Yes, fill in the following question	If No, go to question 2.0

Please state the name of the Professional Body or Learned Society:

Name of the Professional Body or Learned Society (E.g. BEN/ IEN/ ASHRAE/ IET/ IEEE/ IMM/ SAE/ IMECHE/ ICHEME etc.)	Membership Grade (E.g.: Professional Engineer, Chartered Engineer, Fellow / Senior Member / Member / Graduate Member / Associate Member / Affiliate Member, etc.)
1.	
2.	
3.	

2.0 Have you enrolled into any postgraduate degree after the graduation? If Yes, answer the following guestion

If No. continue to question 3.0

Have you been awarded any postgraduate degree?

Ph.D.

- Master Degree / Pursing Ph.D
- Pursuing Master or another Bachelor Degree

Additional Certificate / Diploma

None

None

- 3.0 Have you obtained certification(s) in any field after graduation of UTAR?
- Professional Product-Specific Internal / In-house Certification Certification Certification

Others





Alumni Survey about PEO Achievement

• Results show more than 90% of our alumni who graduated 5 years ago think that they can achieve the long term goal as described in the PEOs

■ PEO1 ■ PEO2 ■ PEO3





Alumni Survey about PEO Achievement

In Summary:

- PEO1 Skilled Engineers
 - 64% are senior engineers or above

• **PEO2**

- Communication skills: 60% got acknowledgement or better
- Leadership: 50% were acknowledged or better
- PEO3 Lifelong Learning and Sustainability
 - 32% considered registering to professional bodies / pursuing postgraduate studies / received professional certificate or inhouse training





PEO Achievement







Integrated CGPA (iCGPA) informs students' holistic development on top of their academic performance, i.e. professional ethics, teamwork, leadership, communication and transferable skills.







Holistic, Entrepreneurial and Balanced Graduates

Malaysia Education

Blueprint



EDUCATION MALAISIA

2015-2025 (Higher Education)





MQA 8 Learning Outcome Domains















ICGPA REPORT BY TRIMESTER/SEMESTER MAY 2019 TRIMESTER

Name	СН
Registration No.	17
NRIC/Passport No.	99
Programme	BACHELOR OF ENGINEERING (HONOURS) ELECTRICAL AND ELECTRONIC ENGINEERING

MQF*	Overall	LOD1	LOD2	LOD3	LOD4	LOD5	LOD6	LOD7	LOD8
igpa	2.6172	2.7865	3.6700	3.6700	1.9980	1.9167	3.3300	N/A	N/A
iCGPA	2.8634	2.9230	3.8114	3.2279	2.2258	2.5520	2.9132	N/A	N/A

MQF LOD*: Malaysian Qualifications Framework Learning Outcome Domains



🔷 igpa 🛛 🔶 icgpa







- LOD 1: Knowledge
- LOD 2: Practical Skills
- LOD 3: Social Skills and Responsibilities
- LOD 4: Values, Attitudes and Professionalism
- LOD 5: Communication, Leadership and Team Skills
- LOD 6: Problem Solving and Scientific Skills
- LOD 7: Information Management and Lifelong Learning Skills
- LOD 8: Managerial and Entrepreneurial Skills

MQF	LOD 1	LOD 2	LOD 3	LOD 4	LOD 5	LOD 6	LOD 7	LOD 8
PLO1	*							
PLO2	*							
PLO3						*		
PLO4						*		
PLO5		*						
PLO6			*					
PLO7			*					
PLO8				*				
PLO9					*			
PLO10					*			
PLO11							*	
PLO12								×





Final Take-Away

- We need more Talented Engineers with High Moral Values to serve Humanity
- Education Profession is the Most Rewarding Profession
- It does not matter what method or strategy we use, but use the method/strategy intelligently to solve problem and achieve something not done before

It takes ten years to grow a tree, but a hundred years to cultivate people







THANK YOU

FOR LISTENING