




Program Outcomes Attainment System (POAS)


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Abstract: *The higher education system must adopt outcome-based education (OBE), which mandates that the curriculum be created based on the targeted skills, knowledge, and characteristics of the students by the time they graduate. Since the PEO, PO, and CO must be evaluated and analysed as part of OBE measurement, a variety of tools, from simple spreadsheets to sophisticated computing application applications, have been developed to help educators efficiently manage and implement OBE into the curriculum. This article discusses the OBE Program Outcomes Attainment System (POAS) that focus on PO achievement analysis which academic advisors can employ to manage the advisees' academic affairs. POAS is a managing tools were loaded with the course-PO mapping, OBE ANAS scores, and course assessment list. The designed system provided outputs of PO attainment results for all user advisees as well as the mapping of PO for upcoming courses offered by the student's curriculum programmed in order to assist the academic advisor in managing and making plans to meet the desired indicator which is 65% of all PO assigned by the institution. The strategy significantly helps advisors keep track of their advisees' academic plans and build trusting relationships and interactions with them.*

Keywords: POAS, PO attainment, OBE ANAS, students' achievement, academic advisor.



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1. INTRODUCTION

In an educational environment, the teaching and learning processes are essential for preparing students with valuable skills, knowledge, and attributes. A clear vision of what students should be able to do is required at the beginning of the OBE process, followed by the design of curriculum, instruction, and evaluation. As part of this method, everything in a system of education is organized and concentrated on the student's achievements based on the learning experiences at the end of his/her studies.

By OBE implementation, the assessment evaluation method was upgraded, with academics aiding students as needed. A well-designed continuous improvement process should contain a method that defines the activities, assessments of student learning outcomes, evaluations of achievement of intended objectives, and the implications of the activities for program adjustments. To create an effective continuous quality improvement process, the program faculty should provide evidence through quizzes, examinations, exams, laboratory work evaluation, case studies, mini-projects, and industry training (Idris et al., 2017). PO attainment is mostly determined by the student's performance and perceptions in several evaluation methods that represent the student's learning achievements. As a result, a good attainment method is required and vital to quantify student learning achievement and predict future performance (Rawat & Karkare, 2015).

2. METHOD

The technique is separated into two sections. The first section gives a description of the OBE-ANAS tool which outputs PO achievement for each course registered under the curricular programme. Second, the OBE-ANAS output was used as part of the POAS input to examine each student's performance on their POs by their respective academic advisor for a future action plan.

2.1 OBE ANAS Overview

The Center for Electrical Engineering Studies, Universiti Teknologi MARA Pulau Pinang (CEES UiTMPP), has developed the OBE-ANAS tool which can be used for all Electrical Engineering programmes included Pasir Gudang, Sarawak and Dungun. Data analysis for creating the certification Self-Assessment Report (SAR) is made easy by the built tool. This tool proposes a more effective technique for the faculty action committee to monitor and evaluate student performance results while also serving as a faculty indicator. Figure 1 shows the homepage of the OBE-ANAS 15.0v system. The OBE-ANAS system is built using the Microsoft Visual C# and Microsoft SQL Server application. The graphical user interface (GUI), which is based on Microsoft Visual C#, is used by the developer to communicate with the database.

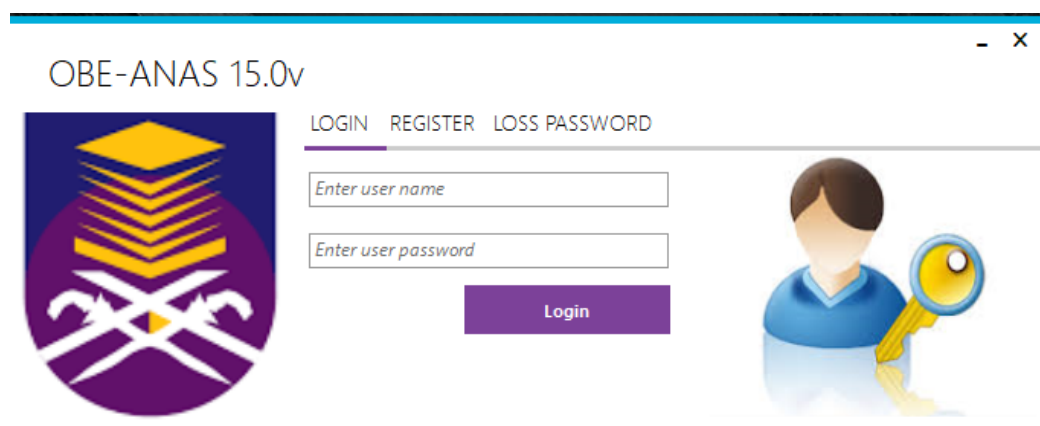


Figure 1. The example of GUI interface of OBE-ANAS 15.0v system.

For OBE ANAS, OBE marks which contains the detailed marks of COs and POs for each subject are accessed through the course evaluation. There is a specific template required which is called as 'CoPO eRES template' as shown in Figure 2 in calculating the student's scores for the course. The lecturer in Charge (LIC) will combine all the data from all groups and enter the student grades using the template and the assessment categories found in the course data as can be seen in Figure 3. According to the course material, this template normally includes all pertinent evaluations, including assignments, quizzes, lab work, short projects, final exams, and others. Then, the "OBE-ANAS" file will be created using the same template and will be uploaded to the OBE ANAS system. OBE ANAS tool serves as a faculty indicator and suggests a better way for the faculty action committee to track and assess student performance outcomes.

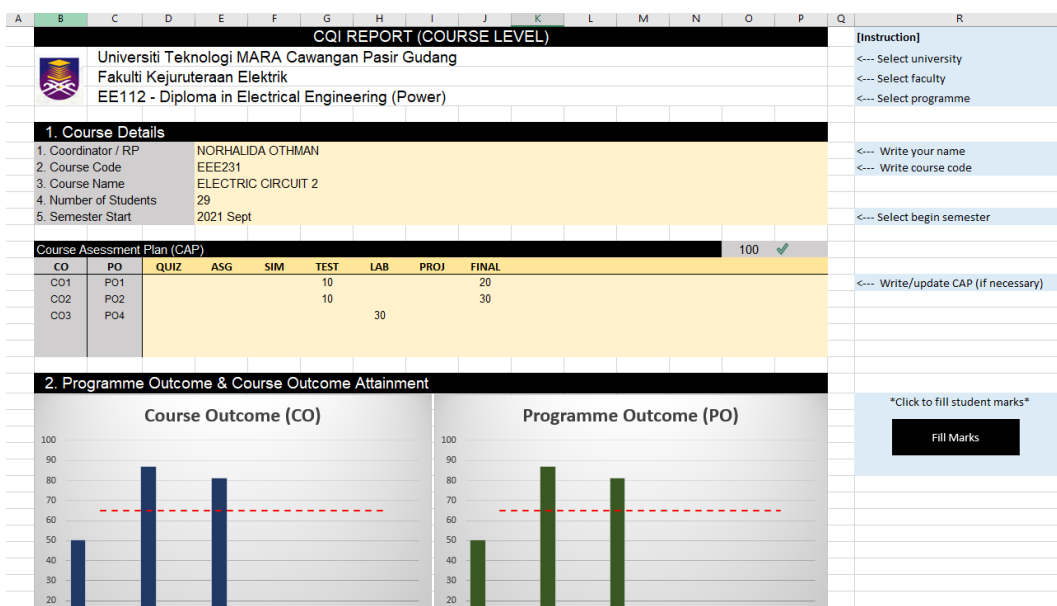


Figure 2. The example CoPO eRES template

#	MTX	NAMA	PO1	PO2	PO4	PO4	PO1	PO2	PO1	PO2	PO1	PO2
1	2020818106	MUHAMMAD RAZMAN BIN ABD RAZAK	5.5	9.1	15.8	2.3	11.0	27.3				
2	2020839208	MUHAMMAD ADIB HAKIMI BIN ABD SAMAD	5.0	7.0	15.7	9.5	10.0	21.0				
3	202089712	MUHAMMAD FAIZ BIN ROSMAN	4.2	8.4	14.4	7.8	8.3	25.2				
4	2020893228	MUHAMMAD HAFIZ BIN SAIDI	5.5	8.7	14.4	10.0	11.0	26.1				
5	2020620316	MUHAMMAD HUZAFIAH BIN MOHD JAIIS	4.2	8.7	13.9	9.2	8.3	26.1				
6	2020453882	MUHAMMAD SYAFIQ BIN SAARI	4.5	8.7	15.7	7.0	9.0	26.1				
7	2020895332	MUHAMMAD SYAHR BIN ABDUL SHUKOR	4.0	7.0	13.3	4.8	8.0	21.0				
8	2020620392	MUHAMMAD SYAZIRIN BIN MOHD ISA	3.2	8.7	16.3	7.0	6.3	26.1				
9	2020839416	MUHAMMAD ZAHIN BIN MOHD SAIFUL	8.7	8.9	16.4	8.3	17.3	26.7				
10	2020895246	MUHAMMAD ZIKRI HAZIQ BIN MASERI	5.8	9.0	17.8	8.3	11.7	27.0				
11	2020854494	NUR IDAYU BINTI ZABIDIN	4.3	9.6	16.8	10.0	8.7	28.8				
12	2020895716	NURFIRAS BIN FAHMI	3.8	8.6	15.7	8.8	7.7	25.8				
13	2020475366	NURUL NADHIRAH BINTI MOHD ANUAR	4.5	9.9	15.8	2.5	9.0	29.7				
14	2020812408	NURULHUDA BINTI SAMAN	6.7	6.8	16.5	7.0	13.3	20.4				
15	2020833264	AFIQ AMSYAR BIN NOR HARILIZAM	4.2	9.1	17.6	7.0	8.3	27.3				
16	2020488426	AHMAD DANISH HAIKAL BIN KAMARUZZAMAN	5.5	8.9	17.1	9.1	11.0	26.7				
17	2020849532	ALIF IQBAL BIN AHAMAT MAHMUD	2.0	9.4	17.4	8.9	4.0	28.2				
18	2020845954	AMEERA ATIKA BINTI MOHD KHIR JUHARI	5.8	8.7	16.6	9.0	11.7	26.1				
19	2020891166	ARSHAD BIN RASHIDAN	7.0	9.3	16.8	7.4	14.0	27.9				
20	2020620942	DANIAL ZARIF BIN MOHAMMAD ZAHARUDDIN	4.7	8.5	17.4	9.5	9.5	25.5				
21	2020881376	IMRAN BIN MOHD RUSLAN	6.5	9.3	17.2	8.7	13.0	27.9				
22	2020852622	KHAIRUL AZIM BIN KHALIL	5.2	8.6	16.7	7.0	10.3	25.8				
23	2020894088	MOHAMMAD AMER HAMZAH BIN MOHD IDRIS	4.8	6.8	16.5	8.6	9.7	20.4				
24	2020239094	MOHAMMAD FAZELI BIN KHAMIS @ SUBARI	7.7	9.6	18.0	10.0	15.3	28.8				
25	2020458464	MOHAMMAD FITRI IMAN BIN MOHD KAHAR	4.7	8.8	16.7	9.1	9.3	26.4				
26	2020891306	MOHAMMAD AIMAN BIN MOHD KHALID	6.7	9.7	17.7	9.2	13.3	29.1				
27	2020845792	MUHAMMAD DANISH ERFAN B ZAINUDDIN	3.3	7.5	17.3	7.3	6.7	22.5				
28	2020464676	MUHAMMAD NAZEEM AN NAJAT BIN SHAMSUL	5.3	9.7	17.4	8.2	10.7	29.1				
29	2020469402	PHERRY ASAN PHILIP	2.8	8.9	17.3	8.2	5.7	26.7				

Figure 3. The example of assessment categories with CO-PO mapping

2.2 POAS

After the OBE ANAS study has been completed in this project POAS is a continuation procedure. The OBE ANAS system calculates the average mark by mapping each course in the database to its corresponding PO. After being derived from the dataset, the average scores were transferred to the excel template and subsequently posted to the POAS system. An academic advisor (PA) can use the POAS to keep track of each student's performance over the previous semester after the PO Attainment (POA) results are obtained from the OBE ANAS. The developed OBE POA system's process block diagram is shown in Figure 4. Three inputs were provided to the system: a list of course assessments, the output produced by the OBE-ANAS system, and the course-PO mapping. The Student POA result and PO-Course Assessment mapping are the two outputs that the system produces as a result of its integration with the Student PA databases. Figure 5 shows the flow chart of this POAS.

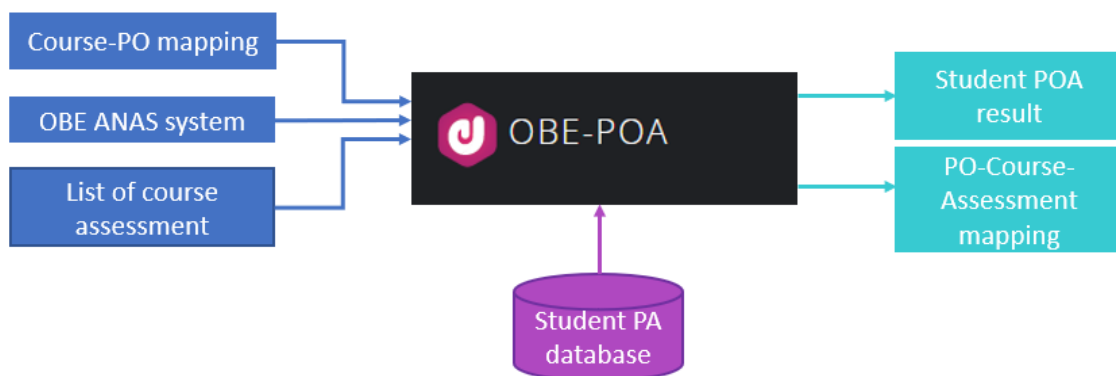


Figure 4. POAS system block diagram

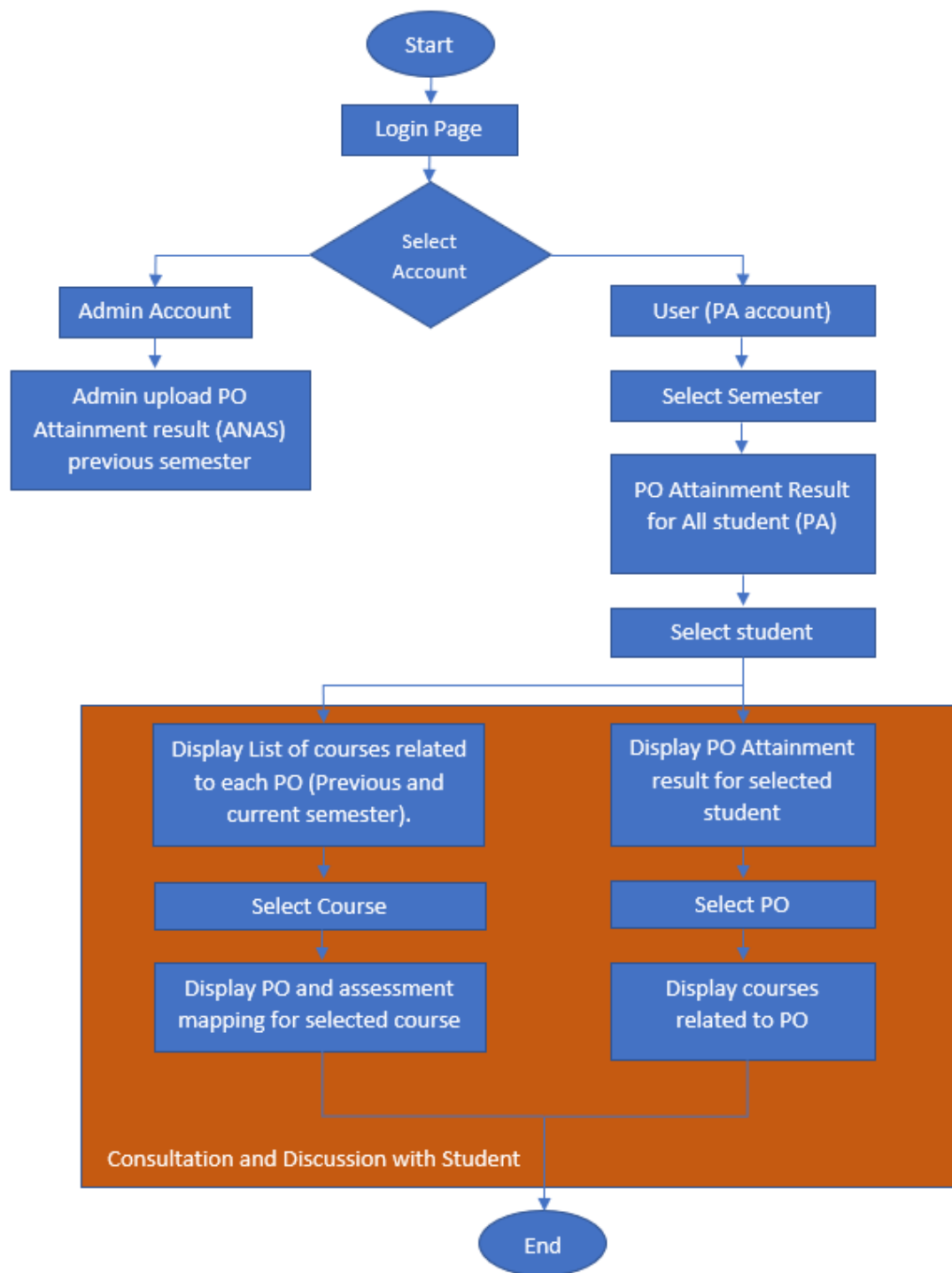


Figure 5. The flowchart of POAS

3. FINDINGS

In POAS, admin and user accounts are the only ones that are accessible when the login page appears. The OBE team representative as an admin account authorization will upload the PO attainment data from OBE ANAS tools. After that, PA as an user account will analysed the PO attainment results for each student under their supervision. The PA must select the semester intake to view the PO attainment results displayed for each of his/her students. The results also show the mapping and achievement of the details of each twelve POs on each student. The list of courses and assessments that are mapped to each PO is also available in this system. To acquire a clear understanding and make a strategy for the next step to enhance their achievement outcomes, PA and students will participate in one-on-one coaching sessions.

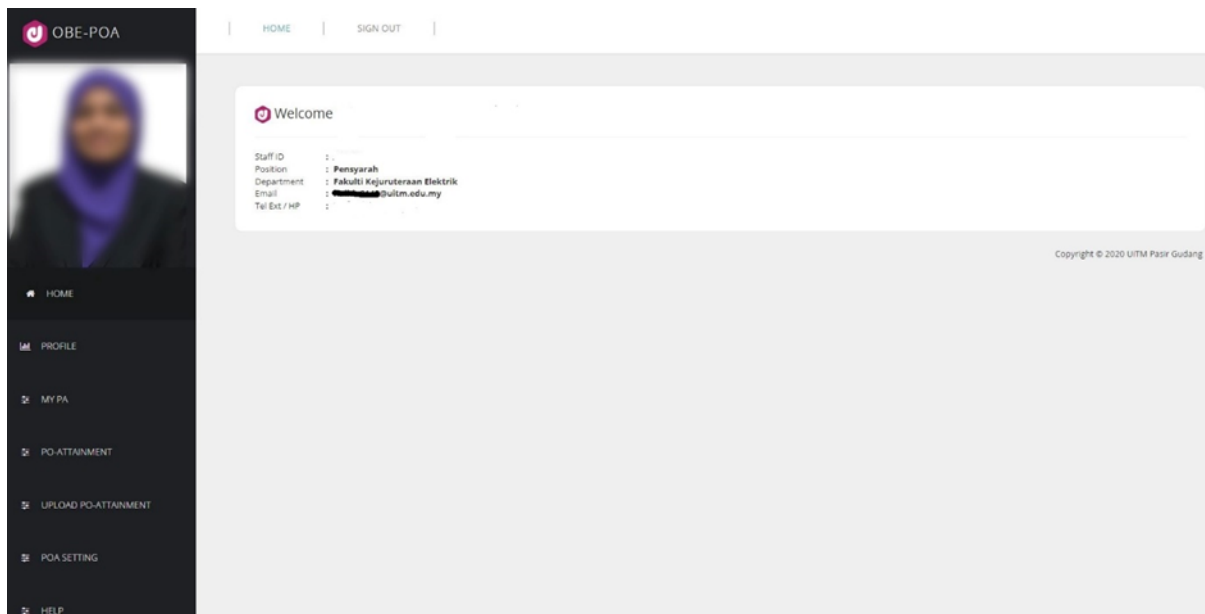


Figure 6. The overview of POAS

From Figure 7, the list of PA students will appear according to the PA account. Then, PA will click the student's name and the values of PO attainment for student X will be seen on the screen as in Figure 8. PA will explain all the POAs to the student. Blue values indicate the POs was achieved compared to red values. Then, PA will click the red values and the system will list all the subjects that are mapped to that POs. The list of courses that are not achieved 65% is illustrated in Figure 9 below. Consequently, the students will know the types of assessments that are mapped to the POs of the courses in Figure 10.

LIST OF MY PA

ADD NEW STUDENT

BIL	STUDENT NAME	STUDENT ID	PA
1	MUHAMMAD AMIR SYAHIN BIN MOHD RAFE	2020842714	308142
2	MUHAMMAD AMIR SYAHMIIR BIN ISHAK	2020478834	308142
3	MUHAMMAD AMIRUL HISHAM BIN ABD KARIM	2020818424	308142
4	MUHAMMAD AMIRUL NAJWAN BIN MOHD ABU ZARIM	2020839128	308142
5	MUHAMMAD AQL AZRAI BIN AZLAN	2020481548	308142
6	MUHAMMAD ARIF BIN JEFRI	2020858228	308142
7	MUHAMMAD DANISH MAZIRA BIN MOHD RAMSYINAR MAZIRA	2020468912	308142
8	MUHAMMAD FAKHRURAZI LUTFI BIN ABDUL MANAN	2020619996	308142
9	MUHAMMAD HAFIZ HAKIMI BIN ZAIDI	2020858774	308142

First | Previous | Next | Last

BACK

Figure 7. The list of PA account

The Values shown by POs are cumulative from semester 1 up to previous semester. Please pay attention to RED color POs

BIL	STUDENT NAME	STUDENT ID	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	MUHAMMAD AMIRUL NAJWAN BIN MOHD ABU ZARIM	2020839128	70.93	56.88	77.28	73	74.67	77.75	71	73.56	57.4	70.34	0	47.67

List of Courses CURRENT SEMESTER (SEMESTER 4)

BIL	SEMESTER	COURSE NAME	CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	4	FUNDAMENTALS OF ENTREPRENEURSHIP	ENT300										✓	✓	✓
2	4	Digital Systems 1	ECE351			✓	✓								✓
3	4	Electronics 2	ELE242		✓		✓								✓
4	4	Final Year Project 1	EEE358				✓	✓							✓
5	4	Linear System	ESE241		✓			✓							✓
6	4	Electronics Design	ELE355			✓		✓						✓	
7	4	Communication Systems	ECM242		✓			✓						✓	
8	4	Introduction to Networking	ECE242			✓		✓						✓	
9	4	Industrial Instrumentation	ESE246		✓			✓						✓	
10	4	Power System	EPO246		✓			✓						✓	
11	4	Electrical Machines	EPO243	✓				✓					✓		

Figure 8. PO-Course mapping

BIL	SEMESTER	COURSE NAME	CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	4	FUNDAMENTALS OF ENTREPRENEURSHIP	ENT300										✓	✓	✓
2	4	Digital Systems 1	ECE351			✓	✓								✓
3	4	Electronics 2	ELE242		✓		✓								✓
4	4	Final Year Project 1	EEE358				✓	✓							✓
5	4	Linear System	ESE241		✓			✓							✓
6	4	Electronics Design	ELE355			✓		✓						✓	
7	4	Communication Systems	ECM242		✓			✓						✓	
8	4	Introduction to Networking	ECE242			✓		✓						✓	
9	4	Industrial Instrumentation	ESE246		✓			✓						✓	
10	4	Power System	EPO246		✓			✓						✓	
11	4	Electrical Machines	EPO243	✓				✓					✓		

COURSE DETAIL

BIL	SEM	COURSE NAME	CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	4	ELECTRONICS 2	ELE242		TEST 1 & TEST 2			LAB WORK							ASSIGNMENT

Figure 10. PO-Course-Assessment mapping

4. DISCUSSION

POAS benefits the PAs in providing a proper approach to explaining PO attainment results to the students. Due to the system being user-friendly and easy to assess, PAs just have to click, show and discuss the PO-Course-Assessment mapping only with their students. The administrative team and PAs can easily access this system where all input facts are successfully loaded and shown. Thus, this POAS is simple to use. Furthermore, the coordination of the POAS is clear and simple to understand. OBE POA system can provide an instant summary of the overall student accomplishment for audit and reporting purposes, especially in Continuous Quality Improvement (CQI). Overall, the process of data monitoring for students' SEE UiTMPG achievement has been improved by the introduction of the POAS.

5. CONCLUSION

The POAS was specifically designed for academic advisors to employ in controlling advisee PO achievement. The suggested tools were created using the cutting-edge programming languages PHP, XAMP, and MySQL. The recommended tools were an extension of existing tools and needed feedback from OBE ANAS to function perfectly. The academic advisor can view and assess the PO performance for each advisee after logging into the database using this tool, which displays specifics about PO attainment for every enrolled student. The management and planning of the consultation are made simple by this effort, and it has a beneficial impact on the adviser and advisee's perspectives and engagements. Students will be able to access this POAS in the future to keep track their achievement from time to time.

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