OUTCOME ANALYSIS OF POS AND COS

HANDBOOK WITH ANALYSIS REPORT

Terminology (Abbreviations)

- **OBE:** Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery, assessment is planned to achieve stated objectives and outcomes. It focuses on measuring student performance i.e. outcomes at different levels.

- **Program Educational Objectives (PEO):** This describes the professional accomplishments of the graduates to be attained within the few years of graduation.

- **Program Outcomes (PO)**: Program outcomes are statements that describe the knowledge, skills and attitudes students should have at the end of the programs. POs should be 12 in number for each programme.

- **Program Specific Outcomes (PSO):** PSOs are outcomes that are specific to a program. PSOs characterize the specificity of the core courses of a program. PSOs can be 2 to 4 in number.

- **Course Outcomes (CO)**: Course Outcomes (COs) are what the student should be able to do at the end of a course. The most important aspect of a CO is that it should be observable and measurable

Mapping of Learning Outcomes (Correlation Level)

It indicates to what extent a certain component (either assessment method to CO or CO to PO or PO to PEO & PSO

- **3-indicates Substantial (high**) mapping (high contribution towards attainment)
- **2-indicates Moderate** (**medium**) mapping (medium contribution towards attainment)
- **1-indicates Slight (low)** mapping (some contribution towards attainment)

Level of attainment

Here 3 levels of attainment is taken as 1-Low; 2-medium; 3- High3 levels of attainment can be defined as

- Attainment 3 : 70% and above
- Attainment 2 : 60% and above
- Attainment 1 : 50% and above
- Attainment 0 : Less than 50%

Setting CO Attainment Targets

There can be several methods

Example 1:

- Same target is identified for all the COs of a course.
- For example the target can be "the class average marks ≥ 60 marks"

Example 2

- Targets are the same for all COs and are set in terms of performance levels of different groups of students.

- While this method classifies students into different categories, it does not provide any specific clues to plans for improvement of quality of learning

Targets			
(% of students getting < 50)	(% of students getting >50 and < 60	(% of students getting >60 and < 70)	(% of students getting $\geq$ 70)
10	40	40	10

Example 3:

- Targets are set for each CO of a course separately

- It does not directly indicate the distribution of performance among the students. However, it has the advantage of finding out the difficulty of specific COs

CO	Target (Class Average)
CO1	70%
CO2	80%
CO3	75%
CO4	65%
CO5	70%
CO6	80%

Example 4:

Here 3 levels of attainment is taken as 1-Low; 2-medium; 3- High3 levels of attainment can be defined as

- Attainment 3 : 70% and above
- Attainment 2 : 60% and above
- Attainment 1 : 50% and above
- Attainment 0 : Less than 50%

Attainment of COs

- Attainment of COs can be measured **directly** and **indirectly**

- Direct attainment of COs can be determined from the performances of students in all the relevant assessment instruments.

- Indirect attainment of COs (which is optional as per NBA) can be determined from the course exit survey.

- The exit survey form should permit receiving feedback from students on all the COs.

Direct CO attainment

- Direct attainment of COs is determined from the performances of students in Continuous Internal Evaluation (CIE) and Semester End Examination (SEE).

- The proportional weightages of CIE: SEE will be as per the academic regulations in force. Proportions of 20:80, 40:60 are all possible!

- Direct attainment of a specific COs is determined from the performances of students to all the assessment items related to that particular CO.

- Hence, every assessment item needs to be tagged with the relevant CO.

- Also, we need data about performance of student's assessment item – wise.

Direct CO attainment from CIE

- Continuous Internal Evaluation (CIE) is conducted and evaluated by the Department itself Thus, institution have access to question-wise marks in all assessment instruments in CIE.

- When questions are tagged with relevant COs, the department has access to performances of students with respect to each CO.

- Hence, computing the direct attainment of COs from CIE is straight forward for Tier 2 institutes.

Direct CO attainment from SEE

- However, Semester End Examination (SEE) is conducted and evaluated by the University for Tier 2 institutes.

- Thus the departments in Tier 2 institutes get only total marks scored in SEE and not question-wise marks!

- As a consequence, departments in Tier 2 institutes have no means of computing the direct attainment of individual COs from SEE!

- SEE performance cannot be ignored!!

- The only possible solution, though not satisfactory, is to treat the average marks in SEE as the common attainment of all COs!!!

CO attainment Computation:

STEP-1: For every subject 4-7 course outcomes (CO) are defined and mapped to Program outcomes (PO) on a scale of 0 to 3. Highest correlation is 3. For example,

	CO's to PO's and PSO's Mapping																			
bject Code	**Engineering Chemsitry** **21SCH21**																			
CO	COURSE OUTCOMES	Modules Covered	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	
CO1	Explain the system concept and apply functional modeling method to model the activities of a static system	1,2	2	3	1	1	-	-	-	-	-	-	-	-	-	2	-	1	
CO2	Describe the behavior of a dynamic system and create an analogous model for a dynamic system	1,2	2	3	1	1	-	-	-	-	-	-	-	-	-	2	-	1	
CO3	Simulate the operation of a dynamic system and make improvement according to the simulation results	1,2,3,4,5	2	3	1	1	-	-	-	-	-	-	-	-	-	2	-	1	

STEP 2:

Maximum marks allotted to each question, mapped to a cognitive level and the corresponding CO. Record the percentage of students achieving a set percentage of max marks allotted to an individual CO in a given IAT.

For example,

STEP 3:

<u>Two</u> best performances of a student from three IATs are used for calculating attainment levels for CO1. The process is described below.

Condition	
IF S3 % of students score ≥ M3% of Max marks allotted to CO - Att. Lev. 3	
ELSE IF S2% of students score ≥ M2% of Max marks allotted to CO - Att. Lev. 2	
ELSE IF S1% of students score ≥ M1% of Max marks allotted to CO - Att. Lev. 1	
ELSE Att. Lev. 0	

In our case we have taken S3, S2, S1 as 60%,50%,40% and M3, M2, M1 as 70%

STEP 4:

Repeat the above condition to evaluate all COs.

Revised Bloom's Levels (L1,L2,L3,L4,L5,L6)	L3	L2	L2	L3	L3	L3	L3	L2	L3	L2	L2	L3	L3	L1		
	CO1	CO1	CO1	CO1	CO1	CO1	CO1	CO1	CO1	CO1	CO2	CO2	CO2	CO2		
IAT-1 2017-18 EVEN SEM																
MAX MARKS	7	3	6	4	7	3	4	6	7	3	6	4	7	3		
USN Name	Q1A	Q1B	Q2A	Q2B	Q3A	Q3B	Q4A	Q4B	Q5A	Q5B	Q6A	Q6B	Q7A	Q7B		
C-02 AQUINA	7	3	6	2	4		1.5	4			5	1	2			
C-03 APOORVA	5		6	2	6		4	6	7	1.5				1		
C-11 ASHWINI	5	3	6	4	7		3	3			5	1				
#Stud >0	5	3	5	4	5	1	5	5	1	1	2	2	2	2		0
70% of Max Marks	4.9	2.1	4.2	2.8	4.9	2.1	2.8	4.2	4.9	2.1	4.2	2.8	4.9	2.1	0	0
# Stud > Max Marks	4	2	4	1	3	1	2	3	1	0	2	0	1	0	0	0
%Stud > Max Marks	80	66.7	80	25	60	100	40	60	100	0	100	0	50	0		
Attainment Level	3	3	3	0	2	3	0	2	3	0	3	0	1	0	0	0
CO1 Attainment	2.11															
CO2 Attainment	1															

STEP 5:

Calculate the attainment levels based on internal test and University Examinations usingthe below formula.

For External Exam	**For Internal Exam**
70% Stud >= 55% of max marks: ATT 3	70% Stud >= 55% of max marks: ATT 3
60% Stud >= 55% of max marks: ATT 2	60% Stud >= 55% of max marks: ATT 2
50% Stud >= 70% of max marks: ATT 1	50% Stud >= 70% of max marks : ATT 1
else ATT 0	else ATT 0

CO attainment level for the that course is,

Course attainment @Internals = 0.75 * Avg IAT attainment + 0.25 * AQSM

STEP 6:

CO's Attainment

CO's	IAT-1 Attainment	IAT-2 Attainment	IAT-3 Attainment	AVG IAT Attainment	AQSM Attainment	INTERNAL Attainment	External Attainment	Final Attainment(80%
SubJect: SMS								
Code: 15CS834								
C01 Attainment	2	NA	3	2.5	3	2.6	3	2.9
C02 Attainment	3	3	NA	3	3	3.0	3	3.0
C03 Attainment	NA	2.7	2.5	2.6	3	2.7	3	2.9
Average Attainment								3.0

STEP 7:

Program outcomes attained through the attainment of COs. For a given course, all COs are mapped to certain POs, as shown in STEP 1. The overall CO attainment value as computed in STEP 7 and the CO-PO mapping values given in the STEP 1 used to compute the attainment of POs.

CO-PO attainment:

PO attainment can be computed for a batch using the below formula.

$$PO/PSO \text{ attainment} = (CO \text{ attainment} * CO\text{-}PO \text{ Mapping})/Max \text{ correlation strength}$$

CO-PO and PSO Attainments

Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
Subject: SMS																
Code 15CS834																
C01	1.95	2.9	0.975	0.975	-	-	-	-	-	-	-	-	-	1.95	-	0.975
C02	2	3	1	1	-	-	-	-	-	-	-	-	-	2	-	1
C03	1.96	2.9	0.98	0.98	-	-	-	-	-	-	-	-	-	1.96	-	0.98
Final Attainment	1.97	3.0	0.98	0.98										1.97		0.98

i.e. CO1 attainment final =2.9 and CO1-PO1 mapping is 2, so the attainment w.r.t CO1 and PO1is = (2.9 * 2)/3 = 1.93

CO1-PO2 mapping is 3 hence CO1-PO2 = (2.9*3)/3 = 2.9

Same process is repeated for all the POs.

Final CO attainment w.r.t PO and PSO

Final CO attainment value	CO-PO and CO-PSO attainment															
	CO-PO1	CO-PO2	CO-PO3	CO-PO4	CO-PO5	CO-PO6	CO-PO7	CO-PO8	CO-PO9	CO-PO10	CO-PO11	CO-PO12	CO-PSO1	CO-PSO2	CO-PSO3	CO-PSO4
3	1.97	3	0.98	0.98	-	-	-	-	-	-	-	-	-	1.97	-	0.98

CO attainment and Gap Analysis
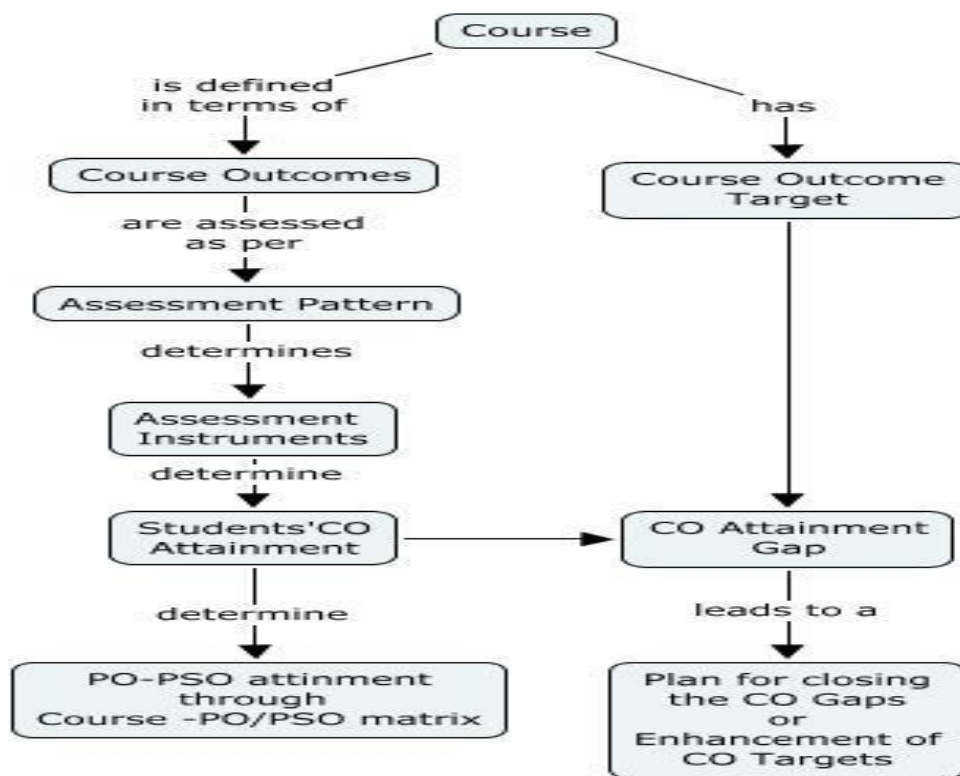
Couse Outcome	Attainment Level for last year	Target for current exam	Attainment Level of current year	Gap	Gap Analysis
CO1		2.9	2.9	-	
CO2	2.8	2.9	3	-	No gap, all students have cleared in externals
CO3		2.9	2.9	-	

STEP 8:

PO attainment can be computed for a batch using the below formula. Indirect attainment is determined from student exit surveys, employer surveys, co-curricular activities, extracurricular activities and mapped to POs. A questionnaire was designed for this purpose and the average response of the outgoing students for each PO is computed.

Final PO attainment for a particular batch = 0.8 * Direct Attainment + 0.2 * Indirect attainment.

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