



RNB

GLOBAL UNIVERSITY

Educating stars for tomorrow

Guidelines for Attainments of CO's and PO's

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Process Document to Attain Course Outcomes, Program Outcomes

Step#1 Framing / Designing Course Outcomes using Bloom's Taxonomy:

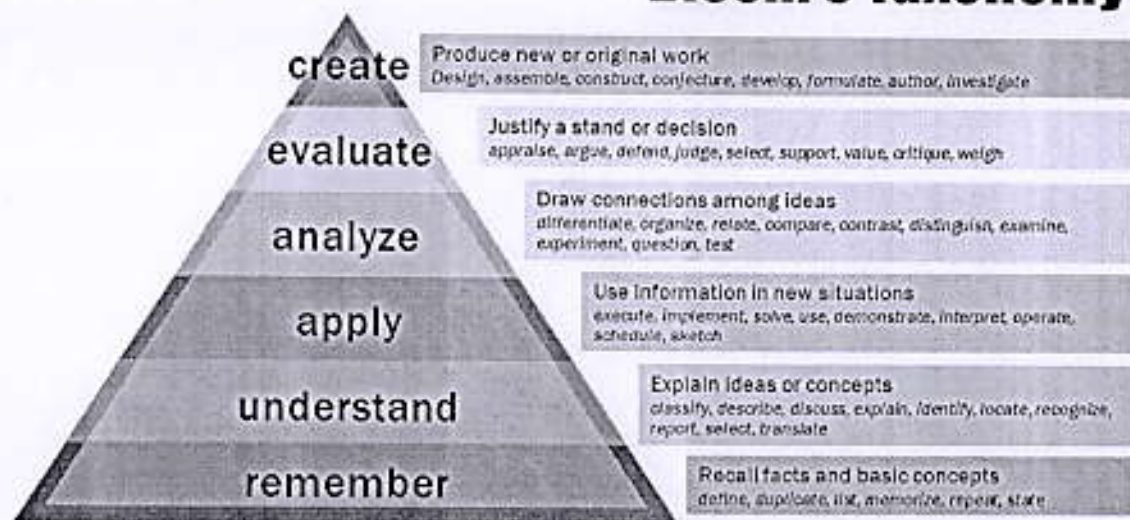
Five Cos were framed for each course considering the cognitive level as per the Bloom's Taxonomy.

<u>Course Outcomes</u>		
Students completing this course will be able to		
CO 1	Examine the various functional system and their functioning	Analyze
CO 2	Identify the utility of impulse turbine and an assortment of design aspects	Understand
CO 3	Investigate the functioning of reaction turbine and its design aspects.	Create
CO 4	Analyze the working nomenclature of reciprocating pumps and fluid systems.	Analyze
CO 5	Identify the cause and effect of hydro power stations.	Understand

In the process to map COs with POs and PSOs, the Course Outcomes are designed to match and fulfill the requirements of Program Outcomes and Program Specific Outcomes. The keywords used to identify COs were as per those defined in bloom's taxonomy in conjunction with the course syllabus. The Course Outcomes are designed by Course Faculty and approved by Quality Improvement Committee (QIC).



Bloom's Taxonomy



The following steps are used to formulate course outcome:

- Detail study of Program Outcomes and Program Specific Outcomes.
- Selection of keywords from the Program Outcomes and Program Specific Outcomes.
- Selection of keywords from Bloom's Taxonomy which can be mapped with keywords selected from Program Outcomes.
- Conjunction of keywords with the course curriculum.
- The course outcomes for each of the courses in the curriculum are mapped according to Program Outcome using Bloom's Taxonomy.
- The questions are selected to assess the Course Outcome and fulfill the requirements of Program Outcomes.
- Evaluation of questions based on two parameters:
- Does CO reflect the intended measurement from specific PO?
- Does the assessment correlates well with the CO?
- Based on the above parameters, the COs are finalized along with their mapping with POs.
- Develop course outcomes for each of the courses in the curriculum.



The strength of mapping of COs with POs are defined at three levels:

Level#1: Slight or Low

Level#2: Moderate or Medium

Level#3: Substantial or High

Method used to identify correlation level is based on the course hours devoted to the specific Course Outcome in the given Program Outcome. Following formula has been used to show the connection between a single Course Outcome and Program Outcome .

The COs-POs mapping depends on two factors: first, the learning level and second, the hours provided for that learning level. There are three learning levels are identified for this purpose.

Learning Level	% of hours required
Master	$\geq 40\%$
Reinforce	$< 40\%$ and $\geq 25\%$
Understanding	$\leq 25\%$ and $\geq 10\%$
Introduction	Less than $< 10\%$

The correlation level will be substantial if hours devoted to the specific PO are to achieve Master level of learning i.e. greater than or equals to 40% of total number of hours allotted to the specific Course Outcome. If hours devoted to the specific PO is to achieve Reinforce level of learning, which is less than 40% and greater than or equals to 25% of total number of hours allotted to the specific Course Outcome, then the correlation level will be Moderate. The correlation will be slight if the hours devoted to the specific PO is less than 25% and greater than or equals to 10% of total number of hours allotted. In case the hours devoted to the specific PO is just to introduce the concept, which is less than 10%, that PO is not considered for correlation with COs.



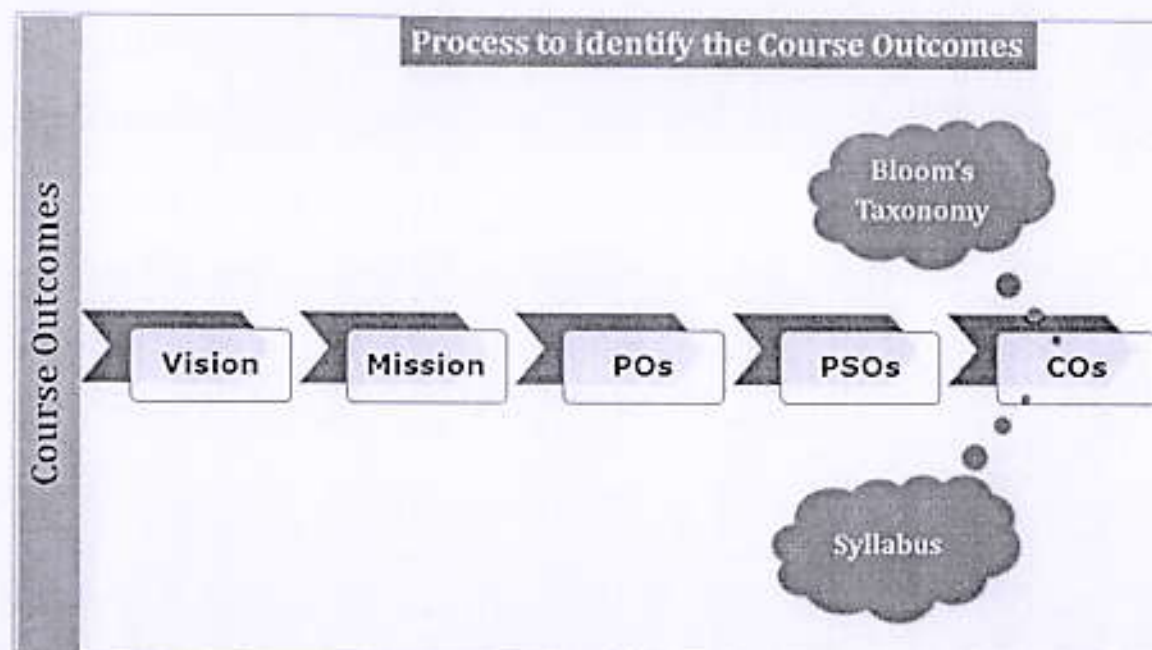


Figure 1: Process to identify the CO's

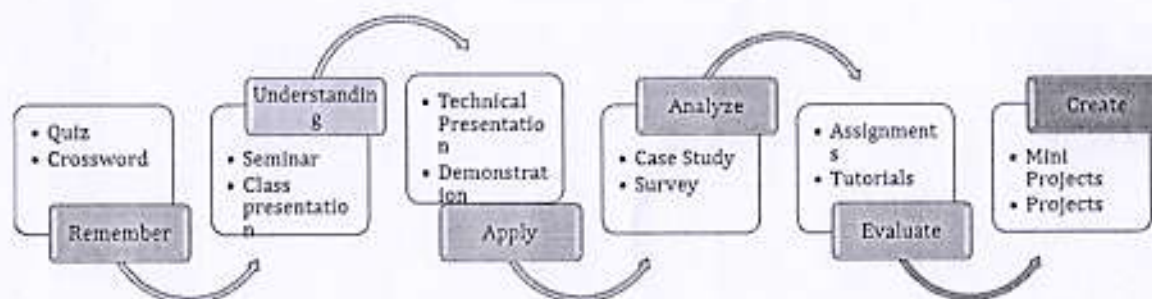


Figure 2 :Levels as per bloom's taxonomy



Step#2 Mapping of Course Outcomes with POs

CO	Course Outcomes	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	Students completing this course will be able to	1	2	3	4	5	6	7	8	9	10	11	12
CO 1	Examine the various hydraulic system and their functioning	3	2	1	1	—	—	—	—	—	—	—	—
CO 2	Identify the utility of impulse turbine and an assortment of design aspects	3	2	1	1	—	—	—	—	—	—	—	—
CO 3	Investigate the functioning of reaction turbine and its design aspects.	3	2	2	1	—	—	—	—	—	—	—	—
CO 4	Analyze the working nomenclature of reciprocating pumps and fluid systems.	2	3	1	1	—	—	—	—	—	—	—	—
CO 5	Identify the cause and effect of hydro power stations.	3	2	2	1	—	—	—	—	—	—	—	—



Sample CO-PO Mapping

Cos	PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO1	PO1
C01	3	2	1	1	-	-	-	-	-	-	-	-
C02	3	2	1	1	-	-	-	-	-	-	-	-
C03	3	2	2	1	-	-	-	-	-	-	-	-
C04	2	3	1	1	-	-	-	-	-	-	-	-
C05	3	2	2	1	-	-	-	-	-	-	-	-
Averag	2.8	2.2	1.4	1	-	-	-	-	-	-	-	-

Step#3: Assessment tools to calculate the attainment of COs

Category	Assessment Tool	Weightage
Internal	Mid Term Examinations (CIE-I, MSE and CIE-II)	50%
External	University Examination	50%

Step#4: Assessment tools to calculate the attainment of POs

Category	Assessment Tools	Parts	Weightage
Direct	Course Attainment	Internal (CIE-I, MSE and CIE-II)	100%

Step#5: Calculation of the POs attainment

5.1: The formula used to calculation of POs attainment based on Course Attainment:

$$PO \text{ Attainment} = \frac{\text{Course Attainment} \times \text{Average Actual mapping strength}}{\text{Maximum possible mapping strength}}$$

Maximum possible mapping strength

