



## APPLICATION BASED TECHNIQUE FOR PROGRAM OUTCOME ATTAINMENT

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**Abstract** — This is web Application for evaluating the attainment of program objectives for engineering graduates as defined by NBA(National Board Of Accreditation).As NBA requires specific evaluation technique and measurement method for measuring the attainment of course outcomes, program outcomes and program educational outcomes. The performance of all students of batch can be displayed graphically. The course outcome is measured on the rubrics, the program outcomes are classified based on the score obtained by course outcomes. Program Outcomes (PO) such as engineering knowledge, Program analysis, Conduct investigation on complex program, the engineer and society, Ethics, Individual and team work, Communication, Lifelong learning etc. Course Outcomes (CO) such as assignment, mini-project, quiz, presentation, viva, lab performance, other co-curricular activities etc. Program Educational Outcomes (PEO) such as the program educational objectives reflects the quality that the student acquired in about 5 years after completing the course. Our project is to stimulate the quality of teaching, self evaluation and accountability in Engineering education and their academic objectives, adopt teaching practices that enables them to product high quality professionals and to assist them in continuously contributing to the domain of knowledge through innovation and research.

**Keywords**- NBA, Attainment, Course Objectives, Program Objectives, Rubrics, Classification, etc.

### I. INTRODUCTION

National Board of Accreditation (NBA) has been judgements with the quality assessments and accreditation of engineering programs.

#### 1.1 Accreditation

Accreditation is a process of quality assurance and improvement, whereby a programmer in a technical institution is critically appraised and given credit for its academic strength and objectives of the institution.

#### 1.2 Attainment

Attainment is the action or fact of achieving a standard result that carried out of desired goals. Primarily attainment is the standard of academic attainment as observed by test or examination result.

### II. BACKGROUND

#### 2.1 Assessment of PO'S, PEO and CO'S

##### 2.1.1 Course Outcomes:

CO are the attributes that the students are expected to demonstrate after completing the course. The result of course outcome (CO) attainment is used to evaluate the attainment of program outcome (PO). Different subject has different CO's [4].

Assessment tools are categorized into direct and indirect methods:

##### 1) Direct Measures:

- assignments
- mini-projects
- quizzes
- examinations
  - Term Test
  - Final Exam
- presentations
- viva
- lab performance (practical knowledge)

##### 2) Indirect Measures:

- Alumni Survey
- Employer Survey
- Student Exit Survey
- Course Exit Survey

Table 1. Attainment Level

Measurement	Needs Improve ment>45 %	Can Better 45% To 60%	Satisfact ory 60% To 75%	Exceeds Expectati on <75%
Weight Age for CR Classification	0	1	2	3

### 2.2.2 Program Outcomes (PO):

Program Outcomes define the qualities attained by the students on completing the program. The PO for a particular course can be formed from the twelve graduates attribute defined by NBA [5].

- Engineering Knowledge.
- Problem Analysis.
- Design & Development of Solutions.
- Conduct Investigation of Complex Problems.
- Modern Tool Usage.
- The Engineer and Society.
- Environment and Sustainability.
- Ethics.
- Individual and Team Work.
- Communication.
- Project Management and Finance.
- Lifelong Learning.

Program Outcomes are framed from the graduate attributes defined by NBA to suit the requirements of the respective departments. The program outcomes for a particular course in Engineering, say Computer Engineering can be defined based on the graduate attributes of NBA as follows:

**PO1: Engineering Knowledge:** Apply knowledge of mathematics, science and Computer Engineering to solve complex Engineering problems

**PO2: Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems to arrive at valid conclusions.

**PO3: Design & Development of Solutions:** Design and Develop System architecture, algorithm, hardware component, or Data Flow Diagram to meet desired needs with real time constraints.

**PO4: Investigation of Complex Problem:** Analyze algorithm, interpret data and calculate time and space complexity to arrive at valid conclusions.

**PO5: Modern Tools Usage:** Apply upgraded tools and techniques in modeling and design of Computer interface.

**PO6: Engineer and Society:** Apply the knowledge to assess societal, health, safety, legal and cultural issue and consequent responsibilities to Computer Engineer.

**PO7: Environment & Sustainability:** Demonstrate knowledge and an understanding of an impact of engineering solution on environment and need for sustainable development.

**PO8: Ethics:** Commit to professional ethics, responsibilities and norms of engineering practice.

**PO9: Individual & Team work:** Work effectively as an individual, and as a member or Team leader in different areas.

**PO10: Communication:** Effectively communicate, write report, design documentation and make presentations.

**PO11: Project management & Finance:** Demonstrate knowledge and an understanding of principles and apply them while managing projects.

**PO12: Lifelong Learning:** Recognize needs for and engage in learning, understanding, and applying new ideas in the context of technological change.

### III. CO-PO MAPPING

The CO-PO mapping has been done with correlation levels 1, 2, 3 and "--" for no correlation as defined below:

1. Slightly (Low)
2. Moderately (Medium)
3. Substantially (High)

Table 2 Sample Co-Po Mapping

Semester Seven						
Course Code	COs	CO-PO MAPPING				
		PO1	PO2	PO3	...	PO12
ERP and Supply Chain Management	CPE7026.1	3	-	-		-
	CPE7026.2	-	3	-		-
	CPE7026.3	-	-	3		-
	CPE7026.4	2	-	3		-

### IV. PROGRAM EDUCATION OBJECTIVES (PEO)

The Program Educational Objectives reflect the qualities that the student acquired in about 5 years after completing the course [5].

Table 3 Mapping of PEOs with POs

PEOs	Pos											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	X				X					X		
2	X	X	X	X	X			X	X		X	X
3			X			X						
4				X			X			X	X	

## V. GUIDELINES FOR GRAPHICS PREPARATION AND SUBMISSION

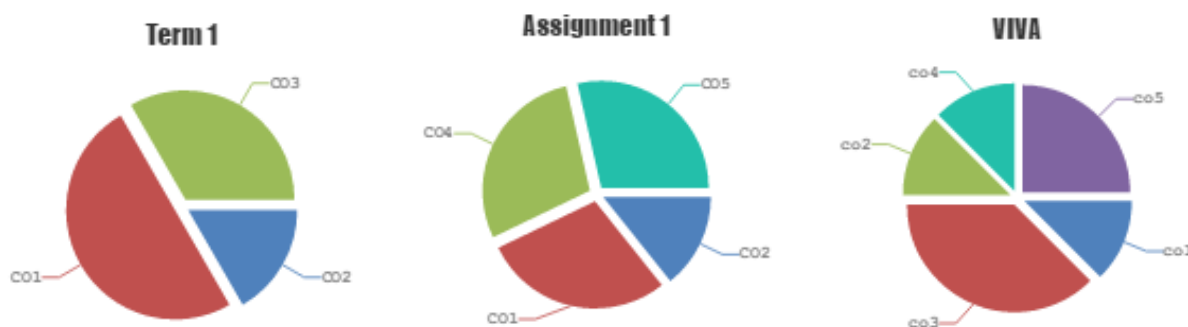


Figure.1 Attainment Levelffs

The above figure shows the extend to which the student of a particular batch has satisfied the course outcome corresponding to a subject that they have studied.

For Term Test1:

The Red colour represents the Attainment level of CO1, Blue colour represents the Attainment level of CO2, Green colour represents the Attainment level of CO3.

For Assignment 1:

The Red colour represents the Attainment level of CO1, Blue colour represents the Attainment level of CO2, Green colour represents the Attainment level of CO4, Sky blue colour represents the Attainment level of CO5.

For VIVA:

The blue colour represents the Attainment level of CO1, Green colour represents the Attainment level of CO2, Red colour represents the Attainment level of CO3, Sky blue colour represents the Attainment level of CO4, Purple colour represents the Attainment level of CO5.

## VI. CONCLUSION

This paper discussed the idea of an effective technique that is generated to reduce the boring work of institute faculties. This system will reduce the time required by an institute to complete the process of the national board of accreditation. The performances of the students are analyzed based on some direct and indirect measures. The overall results will be compared with mission and vision.

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