

# SYSTEM FOR MANAGEMENT OF CONSTRUCTIVE ALIGNMENT FOR TEACHING AND LEARNING ACTIVITIES USING COURSE OUTCOME MAPPING

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**Abstract :** In today's world of intelligent application environment, there is a need for a software in every field. This makes tasks that need to be carried out manually much easier and faster. Such need arises in educational institutes as well. Where Constructive alignment, an approach commonly used to align teaching and learning activities to the respective course outcomes (COs) is used for improving teaching and learning process. The process of mapping and attainment of Cos, which is done by the faculty members of our institute, is complex and time consuming. They find it a daunting task to establish the linking between course outcomes (COs) for each lesson and assessment. Currently this process of CO-PO mapping is done manually on an excel spreadsheet with proper allocation of Course Outcomes to capture all assessment marks scored by students. But this task of creating and maintaining an excel sheet manually, is quite tedious. Hence, our project aims to solve this problem by constructing a software for the same which will not only automate the calculations for this task, but also make it convenient for the users to enter, update, retrieve and process the information.

**IndexTerms - Course outcomes, mapping, constructive alignment, management software, collaborative software, application software, web application.**

## I. INTRODUCTION

Constructive alignment is an approach commonly used to align teaching and learning activities to the respective course outcomes (COs) for the improvement of the teaching and learning process.

'Constructive alignment' is the process that we usually follow when we build up an Outcome Based Education (OBE) syllabus. It is a term coined by Professor John Biggs in 1999, which refers to the process to create a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes. The word 'constructive' refers to what the learner does to construct meaning through relevant learning activities. The 'alignment' aspect refers to what the teacher does. The key to the alignment is that the components in the teaching system, especially the teaching methods used and the assessment tasks are aligned to the learning activities assumed in the intended outcomes.

One of the important element of Outcome Based Education (OBE) is establishment and attainment of Course Outcomes (COs).

A course outcome is what a student can do as a result of a learning experience. It describes a specific task that he/she is able to perform at a given level of competence under a certain situation.

For the improvement of the teaching and learning process educational institutions use the constructive alignment process to gain an insight on what all topics of the courses are well understood by the students and which areas are not. Based on this we can understand which areas of teaching need further improvement. For this the institute carries out the process of CO mapping and calculation of the attainment of the topics of a particular course for a particular exam. The process of mapping and attainment of Cos, which is done by the faculty members of our institute, is complex and time consuming. They find it a daunting task to establish the linking between course outcomes (COs) for each lesson and assessment. Currently this process of CO-PO mapping is done manually on an excel spreadsheet with proper allocation of Course Outcomes to capture all assessment marks scored by students. But this task of creating and maintaining an excel sheet manually, is quite tedious. Hence, we solve this problem by constructing a software for the same which will help the institutes to carrying the process of mapping calculating attainment much easier and faster.

## II. PROPOSED SYSTEM

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in their matriculation through the course. In a university affiliated college, the CO attainment levels can be measured based on the results of the internal assessment. The process of calculating CO is done manual and can lead to human error. Our software aim to reduce this error by automating the calculation. The System has following process:

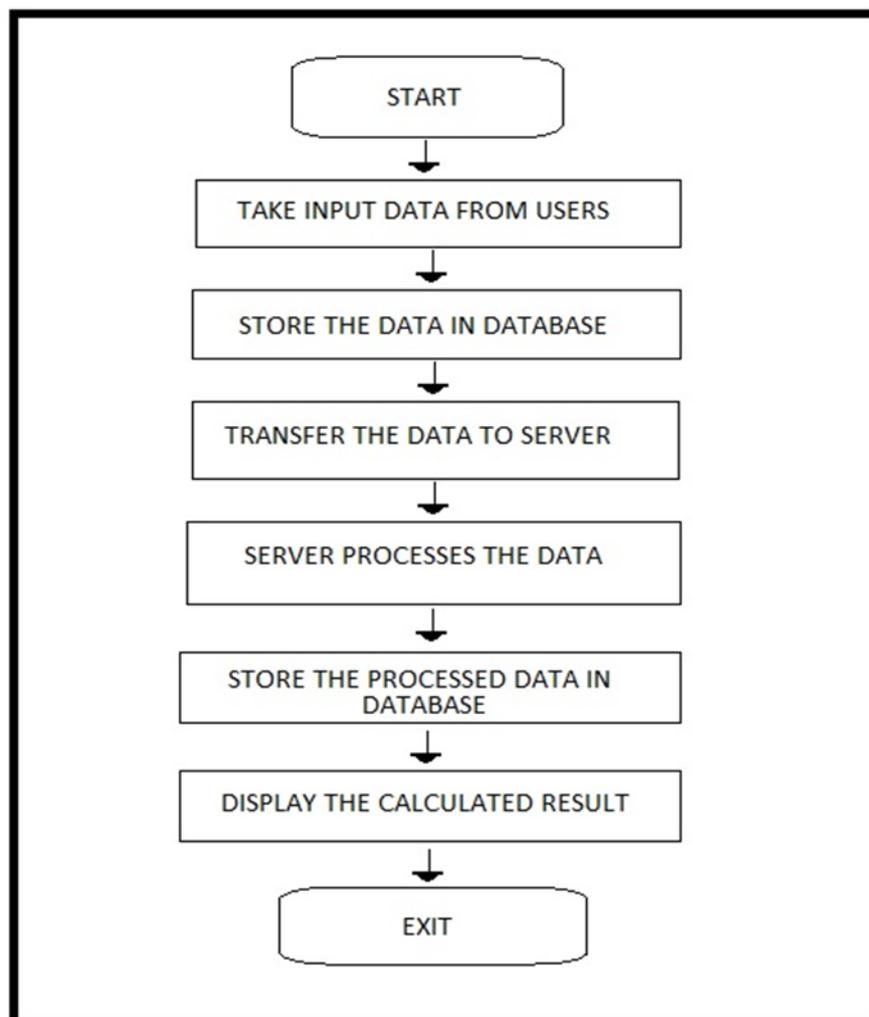


Figure 1 System process flow

### 2.1 Take input from users

The CO attainment is measured based on internal assessment Examination conducted by university. In order to calculate these we need to take various sets of input values. These values helps in identify students from which department have attained which internal assessment exam. Each department have various subject for which internal assessment is been conducted. Each examination have many questions which are linked to CO's. Based on the attempts and marks obtained in internal assessment the CO attainment is been calculated. The user has to provide with input of marks obtained by students question wise.

### 2.2 Storing and Serve database

The marks obtained from the user are stored in the database. The database design is show below. The database is transferred to server in our case we have used Xampp server in order to serve the data. When the user wants to access the data from the database he can access throw the serve or webpage also. The marks obtained from the user are used in calculating the CO attainment for the particular internal assessment. The formula for calculating CO for each internal assessment is follow:

$$\% \text{ Attainment} = \frac{\sum \text{No. of students who attempted the questions with a particular CO}}{\text{No. of present students} \times \text{No. of questions mapped with the CO}} \times 100$$

The marks stored are then stored in the database.

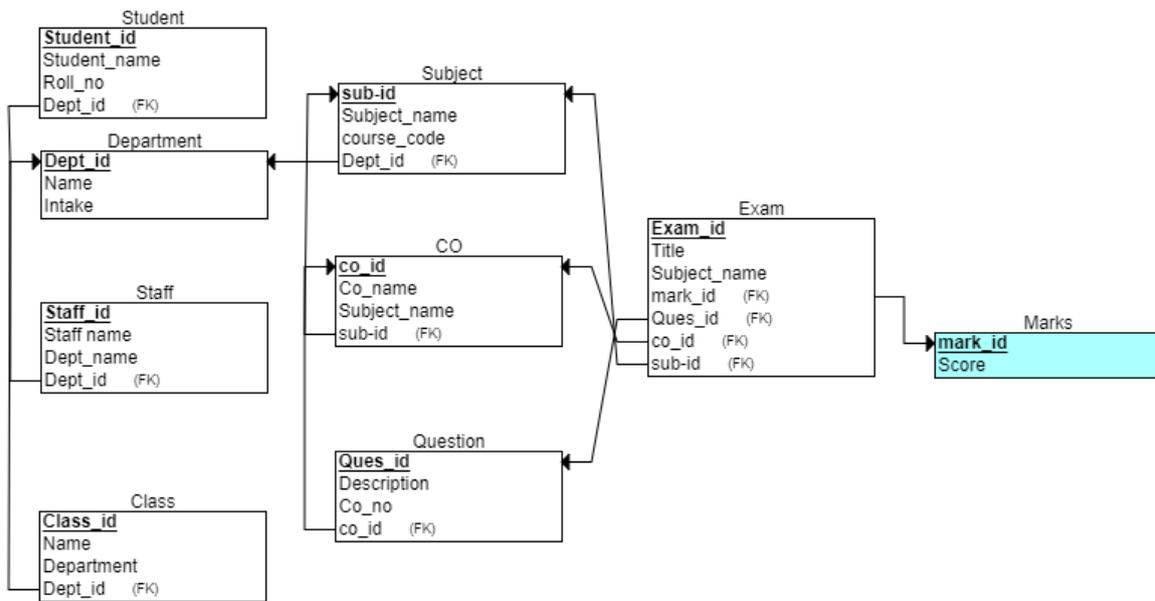


Figure 2 Structure of database

### 2.3 Display the calculated result

The calculated result which has been stored in the database is then called out and the CO attainment for each internal assessment is been displayed.

### Results and output

Each internal assessment consist of many question which are linked with CO. But in order to calculate CO internal assessment for a particular subject number of student who attempted the question with a particular CO is required which may be random ; also while calculating the total marks obtained we might max to consider only the maximum marks obtained in there sub question .Different CO may be assigned to Various question. To calculate particular CO we must consider sum of number of all the student who attempted that CO. The CO for particular internal assessment is as follows:

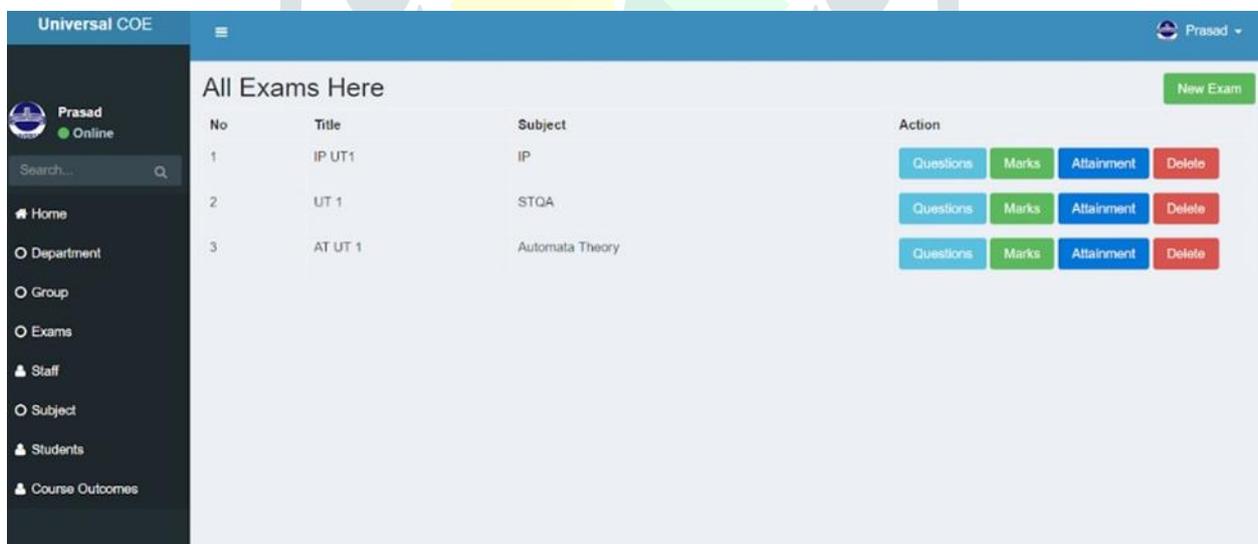


Figure 3 Output (1)

The screenshot displays the 'Universal COE' software interface. On the left is a dark sidebar with navigation options: Home, Department, Group, Exams, Staff, Subject, Students, and Course Outcomes. The main area shows a table of student performance across various quarters (Q1a-Q1f, Q2a-Q2b, Q3a-Q3b) and a total score. Below this is a 'Save' button and a table for 'COURSE OUTCOME ATTAINMENT'. A second 'Save' button is located below the attainment table. A license warning for Handsontable is visible between the two tables.

	ROLL NO	STUDENT	Q1a	Q1b	Q1c	Q1d	Q1e	Q1f	Q2a	Q2b	Q3a	Q3b	Total
1	23	Sanchit Salvi	1	2	3	4	5	6	7	8	9	0	37
2	28	Shubham Kadam	0	9	8	7	6	5	4	3	2	1	41
3	78	Prasad Patil	56	87	79	45	22	43	67	44	33	9	410
4	60	Saumil Varma	11	24	43	23	13	14	56	54	87	2	260
5													
6	TOTAL Q's	ATTEMPTED	3	4	4	4	4	4	4	4	4	3	
7	MAPPED	CO	CO1	CO1	CO1	CO2	CO2	CO3	CO3	CO2	CO2	CO1	

	COURSE OUTCOME	ATTAINMENT
1	CO1	87.5
2	CO2	100
3	CO3	100

Figure 4 Output (2)

### III. CONCLUSION

Hence, in this manner our proposed system will help the educational institutes to carry out the process of constructive alignment with ease and efficiency and make the overall process less time consuming and error-free.

#### References

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