

Procedure for attaining COs, POs/PSOs and PEOs

1. Departmental committee will finalize course outcomes for each course after the series of discussions with all the teachers of the department.

2. Procedure for attainment of COs:

2.1. Course outcomes will be attained through direct and indirect methods.

- Direct Attainment: We will consider the following criteria in the direct attainment
 - ◆ Two Internal tests will be conducted based on COs
 - ◆ Class performance activities consisting of assignments / tutorials/ experiments/quiz/any other activity related to COs will be conducted
 - ◆ External exam marks will be considered.
- Indirect Attainment: In this method, we consider the feedbacks of students, parents, alumni and parents on the framed questionnaires.

2.2. A common format of programmed excel sheet will be used for finding the average attainment of Cos.

2.3. The following table shows the three target levels: Low, Moderate and High attainment for direct and indirect methods

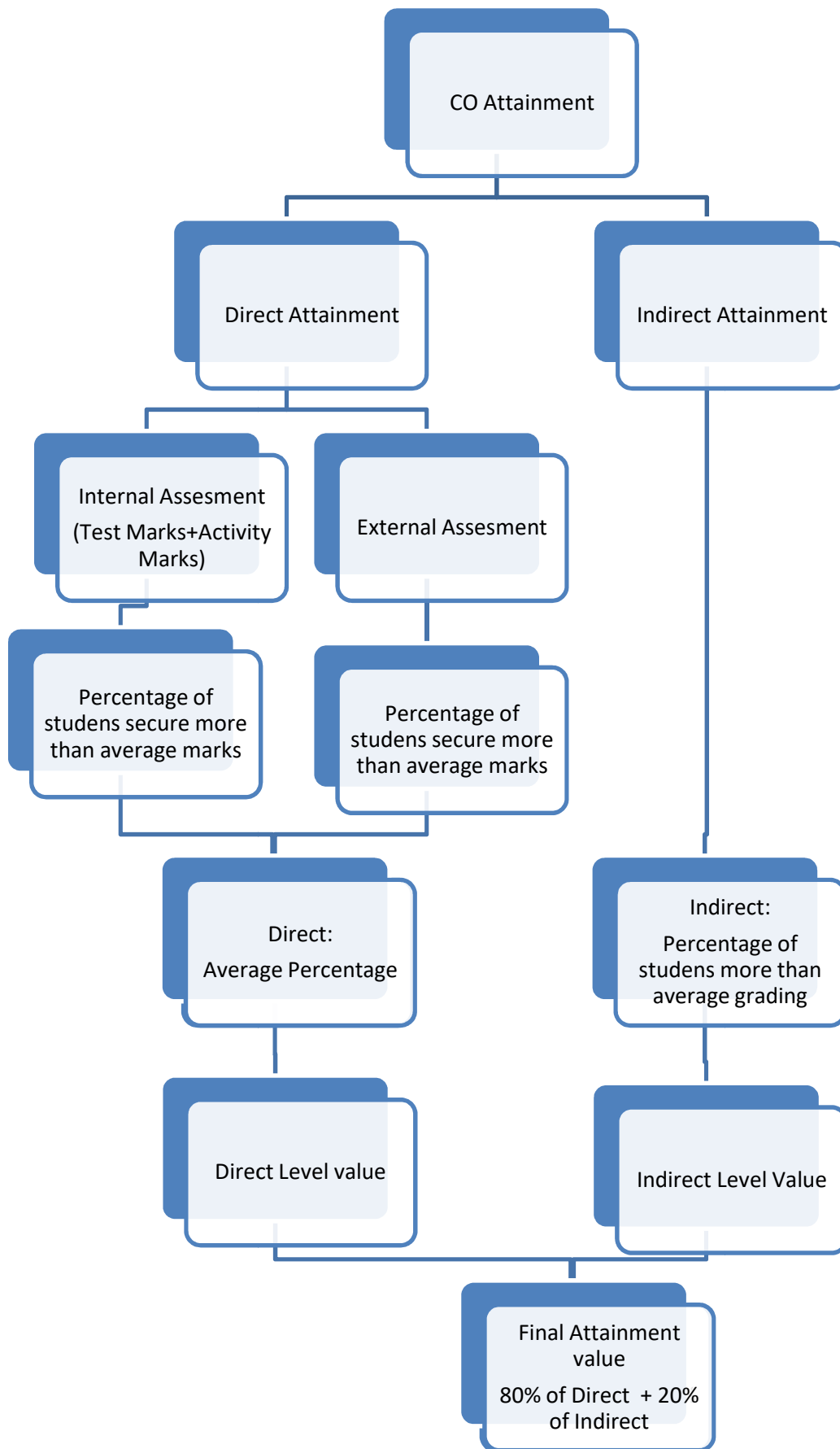
| Level | Average Percentage Level |
|--------------|--------------------------|
| 1 (Low) | 41-50% |
| 2 (Moderate) | 51-60% |
| 3 (High) | 61% and above |

2.4 Target level for attainment of Cos will be set based on average marks of that course in the previous academic year.

2.5. Attainment Level Calculation for each CO=

$$80\% \text{ of direct level} + 20\% \text{ of indirect level of that CO}$$

2.6. Attainment level of all course outcomes of a course will be displayed in a table format.



3. CO-PO Mapping:

Each Course outcome will be mapped to one or more suitable POs

4. Procedure for attainment of POs/PSOs:

4.1. Program outcomes will be attained through direct and indirect methods.

- Direct Attainment: We will consider all the courses which are mapped to a particular PO. Then the direct attainment value will be calculated based on the following formula:

$$\text{Direct PO Attainment} = \frac{\text{Sum of the average attainment level of the course outcomes mapped to a PO}}{\text{Total number of courses}}$$

- Indirect Attainment: In this method, we consider the feedbacks of students, parents, alumni and parents on the framed questionnaires.

4.2. Final PO attainment= 80% of Direct attainment + 20% Indirect attainment

4.3 The following table shows the five target levels:

| Level | PO attainment range |
|---------------|--|
| 1 (Poor) | $0.5 \leq \text{PO attainment value} < 1$ |
| 2 (Average) | $1 \leq \text{PO attainment value} < 1.5$ |
| 3 (Good) | $1.5 \leq \text{PO attainment value} < 2$ |
| 4 (Very Good) | $2 \leq \text{PO attainment value} < 2.5$ |
| 5 (Excellent) | $2.5 \leq \text{PO attainment value} \leq 3$ |

4.4 Target levels for attainment of POs/PSOs will be set based on the performance of the previous year.

4.4 Same procedure will be used for obtaining attainment of PSOs.

5. Procedure for attainment of PEOs:

5.1 We map POs and PSOs with suitable PEOs.

5.2 Direct attainment of PEO = $\frac{\text{Sum of the attainment level of POs and PSOs mapped to a PEO}}{\text{Total number of POs and PSOs}}$

5.3 Indirect attainment of PEOs is based on the feedbacks of students, parents, alumni and parents on the framed questionnaires.

5.4 Final PEO attainment= 80% of Direct attainment + 20% Indirect attainment

6. Attainment of Mission is calculated by mapping PEO's with the Mission statements and assigning the scores.

7. The achievement of vision is evaluated on the basis of Mission attainment values.

8. The sample of CO- PO Mapping, Sample Calculation of CO PO attainment are shown below

CO-PO Mapping

| Course Name and code | CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|-------|-----|-----|-----|-----|-----|
| Group Theory MTU 101 | CO1 | ✓ | ✓ | | ✓ | ✓ |
| | CO2 | ✓ | | ✓ | | ✓ |
| | CO3 | ✓ | ✓ | | | ✓ |
| | CO4 | ✓ | ✓ | ✓ | ✓ | |
| Real Analysis MTU 102 | CO1 | | ✓ | | | ✓ |
| | CO2 | ✓ | | ✓ | | ✓ |
| | CO3 | | ✓ | | | |
| | CO4 | ✓ | ✓ | ✓ | | |
| Complex Analysis MTU 103 | CO1 | ✓ | ✓ | | ✓ | ✓ |
| | CO2 | ✓ | | ✓ | | ✓ |
| | CO3 | | ✓ | | | ✓ |
| | CO4 | ✓ | ✓ | ✓ | ✓ | |
| Ordinary Differential Equations MTU 104 | CO1 | ✓ | ✓ | | | ✓ |
| | CO2 | | | ✓ | | ✓ |
| | CO3 | ✓ | ✓ | | | |
| | CO4 | ✓ | ✓ | ✓ | | |
| Advanced Discrete Mathematics MTU 105 | CO1 | ✓ | ✓ | | ✓ | ✓ |
| | CO2 | ✓ | | ✓ | | ✓ |
| | CO3 | | ✓ | | | ✓ |
| | CO4 | ✓ | ✓ | ✓ | ✓ | |
| Introduction to Probability MTU 106 | CO1 | | ✓ | | | ✓ |
| | CO2 | ✓ | | ✓ | | ✓ |
| | CO3 | ✓ | ✓ | | | |
| | CO4 | ✓ | ✓ | ✓ | | |

CO Attainment of a course

| | Internal Average | Extenal Average | Direct | Level | Indirect | Level | Attainment 80% of direct+ 20% of indirect |
|-----|--|-----------------|--------|-------|----------|-------|---|
| CO1 | 53.57 | 62 | 57.785 | 2 | 70 | 3 | 2.2 |
| CO2 | 55 | 62 | 58.5 | 2 | 85 | 3 | 2.2 |
| CO3 | 60 | 62 | 61 | 3 | 90 | 3 | 3 |
| CO4 | 63 | 62 | 62.5 | 3 | 65 | 3 | 3 |
| | | | | | | | |
| | Group Theory Course outcome Attainment | | | | | | 2.6 |

CO attainment verification

| Course Name | Course code | CO Target Level | CO attainment Level | Fully attained or not | Action taken |
|---------------------------------|-------------|-----------------|---------------------|-----------------------|------------------------------------|
| Group Theory | MTU 101 | 2 | 2.6 | Fully attained | |
| Real Analysis | MTU 102 | 2 | 2.4 | Fully attained | |
| Complex Analysis | MTU 103 | 2 | 2.5 | Fully attained | |
| Ordinary Differential Equations | MTU 104 | 3 | 2.8 | Not attained | More focus on end term examination |
| Advanced Discrete Mathematics | MTU 105 | 3 | 2.4 | Not attained | Set the target level to 2 |
| Introduction to Probability | MTU 106 | 2 | 2.2 | Fully attained | |

PO attainment verification

| PO's | PO Target Level | PO attainment Level | Fully Attained or not | Action taken |
|------|-----------------|---------------------|---|------------------|
| PO1 | 4 | 2.55 | Fully Attained | |
| PO2 | 5 | 2.53 | Fully Attained | |
| PO3 | 4 | 2.54 | Fully Attained | |
| PO4 | 4 | 2.74 | Fully Attained | Set higher level |
| PO5 | 5 | 2.42 | Not attained excellent but reached to very good | |

Program Educational Objectives

| PEO's | PEO Target Level | PEO attainment Level | Fully attained or not | Action taken |
|-------|------------------|----------------------|-----------------------|--------------|
| PEO1 | 2 | | | |
| PEO2 | 3 | | | |
| PEO3 | 2 | | | |
| PEO4 | 3 | | | |
| PEO5 | 3 | | | |