



**PROGRAMME SPECIFIC OUTCOMES**  
**KURIAKOSE ELIAS COLLEGE, MANNANAM**

(Affiliated to Mahatma Gandhi University, Kottayam)

**Outcome Based Education (OBE) Manual**



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**Kuriakose Elias College, Mannanam**

**Outcome Based Education (OBE) Manual (Certain Guidelines)**

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## 1. INTRODUCTION

This Outcome-Based Education (OBE) Manual serves as a comprehensive guide for implementing the OBE approach at K E College. It outlines the philosophy, principles, procedures, and resources to ensure effective integration of OBE across all academic programs.

### OBE OVERVIEW

**Outcome Based Education (OBE)** is an educational model that forms the base of a quality education system. There is no single specified style of teaching or assessment in OBE. All educational activities carried out in OBE should help the students to achieve the set goals. The faculty may adapt the role of instructor, trainer, facilitator, and/or mentor, based on the outcomes targeted.

OBE enhances the traditional methods and focuses on what the Institute provides to students. It shows the success by making or demonstrating outcomes using statements "able to do" in favor of students.

OBE provides clear standards for observable and measurable outcomes.

#### Why OBE?

- International recognition and global employment opportunities.
- More employable and innovative graduates with professional and soft skills, social responsibility and ethics.
- Better visibility and reputation of the technical institution among stakeholders.
- Improving the commitment and involvement of all the stakeholders.
- Enabling graduates to excel in their profession and accomplish greater heights in their careers.
- Preparing graduates for the leadership positions and challenging them and making them aware of the opportunities in the technology development.

#### Benefits of OBE

- **Clarity:** The focus on outcome creates a clear expectation of what needs to be accomplished by the end of the course.
- **Flexibility:** With a clear sense of what needs to be accomplished, instructors will be able to structure their lessons around the students' needs.
- **Comparison:** OBE can be compared across the individual, class, batch, program and institute levels.
- **Involvement:** Students are expected to do their own learning. Increased student involvement allows them to feel responsible for their own learning, and they should learn more through this individual learning.



## 2. VISION, MISSION AND CORE VALUES OF INSTITUTE

### Vision of Institute

To become a center par excellence of learning, unique in experience, value-based approach, and committed in service for enriching and fulfilling life.

### Mission of Institute

To facilitate the comprehensive and integral development of individuals who effectively function as instruments of social changes imbued with righteousness and courage of conviction, dare to dream and strive to achieve.

### Core values

- Pursuit of excellence
- Faith in God
- Holistic development of individuals
- Social Responsibility
- Equal Opportunities to all.
- No Gender biasness.
- Healthy and Pleasant ambiance for effective teaching learning process.
- Respect individual differences and dignity of labor.
- Promote creativity, innovation, team spirit and healthy competition in all activities.
- Sharing of experience, knowledge and skills.
- Appreciation of intellectual excellence and creativity.
- Willingness to explore new ideas.



### 3. OBE FRAMEWORK OF THE INSTITUTE

The adoption of OBE framework of the institute is shown below:

#### A. Program Level:

- Develop program outcomes: Define broad graduate attributes expected upon completion of the program.
- Align program outcomes with university and accreditation requirements.
- Design curriculum and resources to achieve program outcomes.
- Develop assessment strategies to evaluate program outcomes.

#### B. Course Level:

- Develop course learning outcomes (CLOs) aligned with program outcomes.
- Structure course content and activities to achieve CLOs.
- Design effective assessment methods for each CLO.
- Analyze assessment results and improve course design as needed.

#### Roles and Responsibilities:

- Faculty: Design, deliver, and assess courses, develop learning materials, and participate in curriculum development.
- Heads of the Department: Lead OBE implementation within their departments, provide faculty support, and monitor program outcomes.
- Academic Council: Oversee the implementation of OBE across the college, design and implement assessment practices, analyze data, and recommend improvements.

#### Resources and Support:

- Workshops and training programs on OBE for faculty members.
- Development of learning materials and assessment tools aligned with OBE principles.
- Provision of IT infrastructure and tools to support online learning and assessment.
- Peer review and mentoring programs for faculty members.



### Monitoring and Evaluation:

- Regularly review the effectiveness of OBE implementation through data analysis and internal audits.
- Update the OBE Manual as needed to reflect best practices and emerging trends

#### **i. Before Start of Semester**

- Define CO, PO and PSO
- Curriculum design and mapping
- Faculty training and development

#### **ii. During Semester**

- Approve & allow to teach
- Identifying student competency & action taken
- Execution of all other activities

#### **iii. Till End of Semester**

- Implementation & Verification in classrooms and laboratory
- If any difficulty faced, Resolve with Subject Expert/Program Coordinator/HoD
- Assessment and Evaluation, CO-PO attainments & analysis
- Submission of Analysis to Program Coordinator/HoD



#### 4. REVISED BLOOM'S TAXONOMY

Bloom's taxonomy is considered as the global language for education. Bloom's Taxonomy is frequently used by teachers in writing the course outcomes as it provides a readymade structure and list of action verbs. A summary of Anderson and Krathwohl's revised version of Bloom's taxonomy of critical thinking is provided in below Figure:

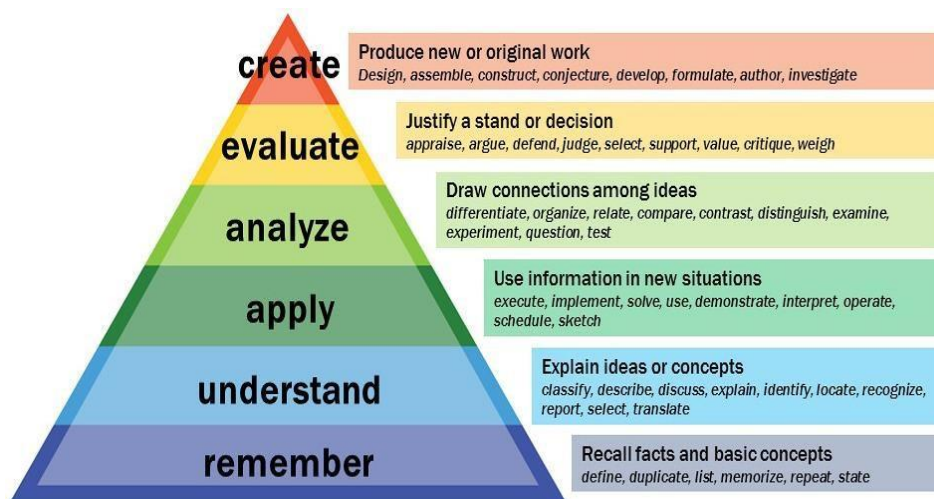


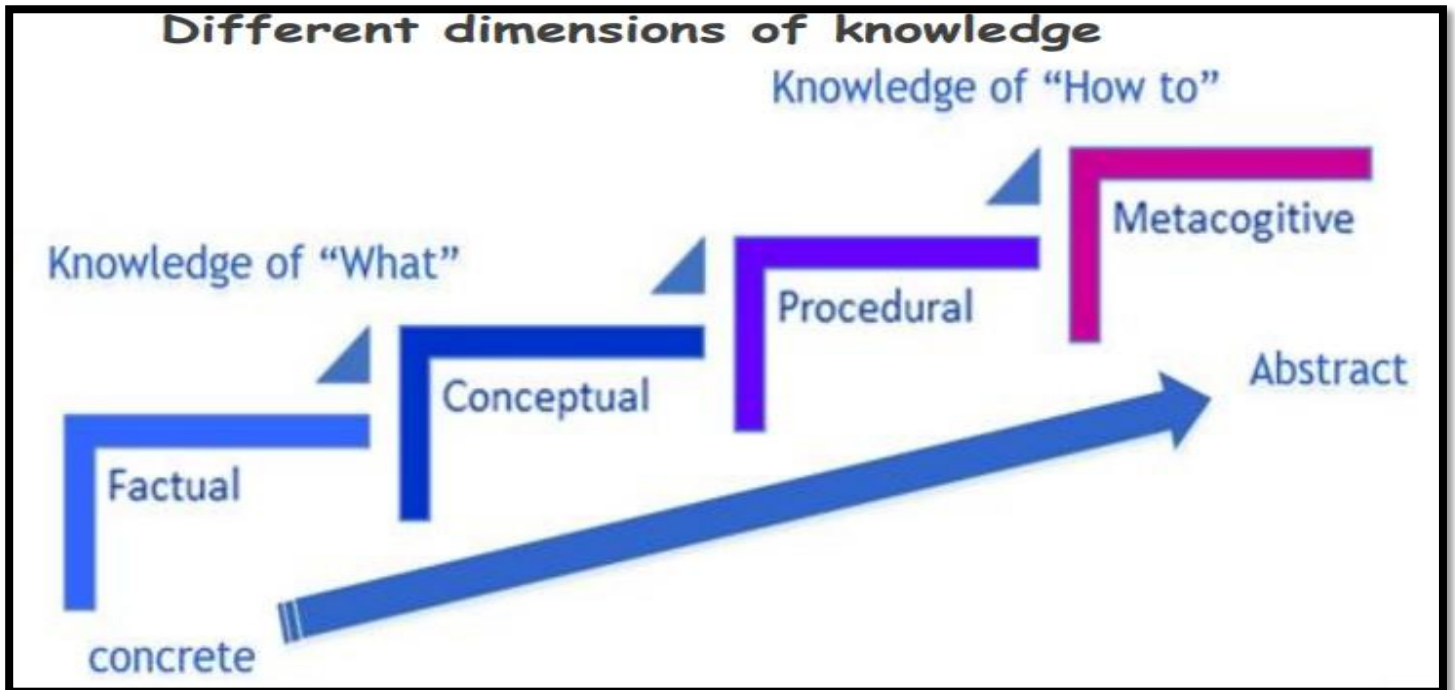
Figure 1: Revised version of Bloom's taxonomy

#### Definitions of the different levels of thinking skills in Bloom's taxonomy:

1. **Remember:** Recalling relevant terminology, specific facts, or different procedures related to information and/or course topics. At this level, a student can remember something, but may not really understand it.
2. **Understand:** The ability to grasp the meaning of information (facts, definitions, concepts, etc.) that has been presented.
3. **Apply:** Being able to use previously learned information in different situations or in problem solving.
4. **Analyze:** The ability to break information down into its component parts. Analysis also refers to the process of examining information in order to make conclusions regarding cause and effect, interpreting motives, making inferences, or finding evidence to support statements/arguments.
5. **Evaluate:** Being able to judge the value of information and/or sources of information based on personal values or opinions.
6. **Create:** The ability to creatively or uniquely apply prior knowledge and/or skills to produce new and original thoughts, ideas, processes, etc. At this level, students are involved



| The cognitive process dimensions- categories   |   |   |  |  |   |
|--|---|---|--|--|---|
| Lower Order of Thinking (LOT)  |   |   | Higher Order of Thinking (HOT)   |  |   |
| <b>L1:<br/>REMEMBER</b>  | <b>L2:<br/>UNDERSTAND</b>   | <b>L3:<br/>APPLY</b>  | <b>L4:<br/>ANALYSE</b>   | <b>L5:<br/>EVALUATE</b>  | <b>L6:<br/>CREATE</b>   |
| <ul style="list-style-type: none"> <li>• Recognising</li> <li>• Recalling</li> </ul> | <ul style="list-style-type: none"> <li>• Interpreting</li> <li>• Illustrating</li> <li>• Classifying</li> <li>• Summarizing</li> <li>• Comparing</li> <li>• Explaining</li> </ul> | <ul style="list-style-type: none"> <li>• Executing</li> <li>• Implementing</li> </ul> | <ul style="list-style-type: none"> <li>• Differentiating</li> <li>• Organizing</li> <li>• Attributing</li> </ul> | <ul style="list-style-type: none"> <li>• Checking (coordinating detecting, testing, monitoring)</li> <li>• Critiquing (judging)</li> </ul> | <ul style="list-style-type: none"> <li>• Planning</li> <li>• Generating</li> <li>• Producing</li> </ul> |







## 5. ACTION VERBS FOR COURSE OUTCOMES

### List of Action Words Related to Critical Thinking Skills:

Here is a list of action words that can be used when creating the expected student learning outcomes related to critical thinking skills in a course. These terms are organized according to the different levels of higher-order thinking skills contained in Anderson and Krathwohl’s (2001) revised version of Bloom’s taxonomy.

Here is the revised Bloom’s document with action verbs, which we frequently refer to while writing Course Outcomes (COs) for our courses.

### Sample Action Verbs for Course Outcomes (COs):

| Remembering                          |           | Understanding  |           | Applying                                     |          | Analyzing                               |            | Evaluating                           |            | Creating                                |          |
|--------------------------------------|-----------|--|-----------|--|----------|---|------------|--------------------------------------|------------|---|----------|
| <b>To find or recall information</b> |           | <b>To construct meaning from written material or graphics.</b> |           | <b>To use information in new situations.</b> |          | <b>To draw connections among ideas.</b> |            | <b>To value information or ideas</b> |            | <b>To produce new or original work.</b> |          |
| Define                               | Name      | Associate  | Estimate  | Calculate                                    | Modify   | Break Down                              | Experiment | Appraise                             | Measure    | Compose                                 | Fomulate |
| Draw                                 | Outline   | Classify   | Explain   | Change                                       | Organize | Categorize                              | Illustrate | Argue                                | Rank       | Construct                               | Generate |
| Duplicate                            | Recall    | Compare  | Identify  | Classify                                     | Plot     | Combine                                 | Inspect    | Assess                               | Rate       | Create                                  | Produce  |
| Identify                             | Recognize | Comprehend   | Indicate  | Compile                                      | Practice | Connect                                 | Predict    | Conclude                             | Recom-mend | Criticize                               | Propose  |
| Label                                | Select    | Demonstrate  | Interpret | Compute                                      | Present  | Contrast                                | Question   | Convince                             | Score      | Design                                  | Revise   |
| List                                 | Show      | Describe   | Relate    | Employ                                       | Produce  | Debate                                  | Research   | Evaluate                             | Select     | Develop                                 | Rewrite  |
| Match                                | State     | Differentiate  | Restate   | Execute                                      | Show     | Differentiate                           | Separate   | Grade                                | Support    | Direct                                  |          |
|                                      |           | Discuss  | Select    | Illustrate                                   | Solve    | Distinguish                             | Simplify   | Investigate                          | Test       |   |          |
|                                      |           | Distinguish  | Summarize | Implement                                    | Use      | Examine                                 | Subdivide  | Justify                              |            |   |          |
|                                      |           | Translate  |           | Map  | Write    |   |            |                                      |            |   |          |
|                                      |           |  |           | Model  |          |   |            |                                      |            |   |          |

**Illustration (use of action verb w.r.t knowledge dimension and order of thinking):**

| <b>BLOOM'S LEVEL/<br/>Use of Action Verbs</b> | <b>Factual</b>                                  | <b>Conceptual</b>  | <b>Procedural</b>                               | <b>Metacognitive</b>                           |
|---|---|--|---|--|
| <b>L1: REMEMBER</b>                           | <b>List</b> properties of Soil.                 | <b>Recognize</b> characteristics of material.  | <b>Explain</b> working of pump.                 | <b>Identify</b> strategies for report writing. |
| <b>L2: UNDERSTAND</b>                         | <b>Summarize</b> features of a new product.     | <b>Classify</b> adhesives by toxicity.   | <b>Explain</b> assembly instructions.           | <b>Predict</b> the behaviour of member.        |
| <b>L3: APPLY</b>                              | <b>Respond</b> to frequently asked questions.   | <b>Provide</b> advice to team members.   | <b>Carry out</b> pH tests of water samples.     | <b>Use</b> modern techniques to get solution.  |
| <b>L4: ANALYSE</b>                            | <b>Explain</b> the selection of tool/ activity. | <b>Differentiate</b> Lower Order of Thinking (LOT) and Higher Order of Thinking (HOT). | <b>Integrate</b> compliance with regulations.   | <b>Assess</b> the project work.                |
| <b>L5: EVALUATE</b>                           | <b>Select</b> the appropriate tool.             | <b>Determine</b> relevance of results.   | <b>Judge</b> efficiency of sampling techniques. | <b>Reflect</b> on one's progress.              |
| <b>L6: CREATE</b>                             | <b>Generate</b> a log of daily activities.      | <b>Assemble</b> a team of experts.   | <b>Design</b> efficient project workflow.       | <b>Create</b> a learning portfolio.            |



## 6. GUIDELINES FOR WRITING COURSE OUTCOME STATEMENTS

Well-written course outcomes involve the following parts:

- Action verbs
- Subject content
- Level of achievement
- Modes of performing task

**Illustration:**

Students are able to

- Design column splices and bases. → Action verb (underlined)
- Determine the losses in a flow system. → Subject content
- Use structural analysis software to a competent Level. → Level of achievement
- Present seminar on real life problems. → Modes of performing task with action verb (underlined)

*While writing COs the following questions/points must be addressed properly.*

|                   |   |
|-------------------|---|
| <b>Specific</b>   | Is there a description of precise behavior and the situation it will be performed in? Is it concrete,detailed, focused and defined? |
| <b>Measurable</b> | Can the performance of the outcome be observed and measured?  |
| <b>Achievable</b> | With a reasonable amount of efforts and application can the outcome be achieved? Are you attempting too much?                       |
| <b>Relevant</b>   | Is the outcome important or worthwhile to the learner or stakeholder? Is it possible to achieve this outcome?                       |
| <b>Time-Bound</b> | Is there a time limit, rate, number, percentage or frequency clearly stated? When will this outcome be accomplished?                |



## 7. QUALITY OF COURSE OUTCOMES

### Guidelines/Checklist for COs:

|   |  |
|---|--|
| <b>Number of COs</b>                          | 3 to 6   |
| <b>CO Essentials</b>                          | Action Verb, Subject Content, Level of Achievement, Modes of Performing task (If Applicable) |
| <b>Based on BTL</b>                           | Understand, Remember, Apply, Analyse, Evaluate, Create                                       |
| <b>Number of BTL Considered in one course</b> | Minimum 3  |
| <b>Technical Content/ point ofCurriculum</b>  | All curriculum contents are covered  |
| <b>Curriculum gap</b>                         | Additional CO for gap identified/filling.Adds more weightage                                 |



## 8. CO-PO MAPPING GUIDELINES

### A) Number of Assessment Tools used

| Level             | Assessment tools used to assess the CO |
|-------------------|--|
| No mapping<br>(-) | 0                                      |
| Low (1)           | 1                                      |
| Medium (2)        | 2                                      |
| High (3)          | 3                                      |

Assessment tools are in place for computing Direct Attainment of Theory Courses, Laboratory Courses and Project:

#### Theory Courses

- Class Tests
- Seminars
- Group Discussions
- Semester End Examination

#### Laboratory Courses

- Continuous monitoring in regular laboratory sessions (Laboratory Courses)
- Internal Laboratory Examination
- Laboratory Semester End Examination
- Internal assessments
- Viva-voce
- Report submission

Every CO must be correlated with each PO and appropriate mapping may be selected.

**B) Keywords**

| Level          | Keywords Used in writingCos  |
|----------------|--|
| No mapping (-) | Key words are not related with course or any outcomes  |
| Low (1)        | Part of PO is reflected through keywords/action verbs.   |
| Medium (2)     | Major part of PO is reflected through keywords/action verbs and moderate level performance is expected from student to achieve PO. |
| High (3)       | Exact action verb of PO and critical performance expected from student to achieve PO.  |

**C) Assessment Type**

| Level          | Assessment Depth  |
|----------------|---|
| No mapping (-) | Test items (1) OR Nil                                       |
| Low (1)        | Test items (2) OR Assessment item (1)                       |
| Medium (2)     | Test items (2) + Assessment item (1) OR Assessment item (2) |
| High (3)       | Test items (2) + Assessment item (2) and More               |

**Test Item:**

- Class Tests
- Semester End Examination

**Assessment Items:**

- Quizzes
- Assignment problems
- Laboratory experiments
- Project, field work and report presentation
- Tutorials, activities & etc



## 9. ATTAINMENT OF COURSE OUTCOMES (COs) AND PROGRAM OUTCOMES (POs)

The institution's teaching and learning process is a key factor in achieving the desired outcomes. We have implemented a comprehensive Outcome-Based Education (OBE) framework with the support of EMBASE ERP system that focuses on evaluating student performance according to predefined learning outcomes.

### **Evaluation Process**

Course instructors are responsible for aligning Course Outcomes (COs) with Program Outcomes (POs). This alignment is crucial as it ensures that the educational objectives of the program are being met through individual courses. The Embase ERP system is utilized to manage the evaluation process, which includes both internal and external assessments. The academic committee and Heads of Department (HODs) collaboratively establish benchmarks to measure CO and PO attainment, ensuring a standardized approach across different courses and programs.

### **Weightage of Assessments**

The evaluation process assigns weightage to different assessment components to comprehensively view student performance, aimed at achieving Course Outcomes (COs) and Programme Outcomes (POs).

- ❖ Direct Assessment (100%):
  - Internal Assessments (20%): These include quizzes, assignments, mid-term exams, and other formative assessments that gauge students' ongoing understanding and skills.
  - External Assessments (80%): This primarily includes final exams and other summative assessments that evaluate overall student learning and achievement.

### **Benchmark Levels for Attainment**

Benchmarks for Course Outcome (CO) attainment are established to evaluate student performance against predefined targets, helping to determine the effectiveness of program outcomes and providing clear criteria for assessing CO attainment.



1. Competence Threshold (Target):
  - a. Undergraduate (UG) and Postgraduate (PG): 35%
2. Undergraduate Program and and Postgraduate (PG) Benchmarks:
  - a. Attainment Level 1: 20% of students exceed the target.
  - b. Attainment Level 2: 30% of students exceed the target.
  - c. Attainment Level 3: 40% of students exceed the target.

These levels provide insights into CO and Programme Outcome (PO) attainment, indicating how effectively the program outcomes are being achieved.

### Calculation for Course Attainment and PO Attainment

#### 1. Course Attainment:

Direct Assessment:

- **Internal Assessment (20%):** This is the average of each CO attainment.
- **External Assessment (80%):** This is considered as 3.

#### Detailed Calculation

##### a. Internal Assessment:

$$\text{Internal Assessment} = \left( \frac{\text{Internal Average of Each CO Attainment}}{100} \times 20\% \right)$$

##### b. External Assessment:

$$\text{External Assessment} = \left( \frac{3}{100} \times 80\% \right)$$

#### CO Attainment Calculation:

$$\text{Course Attainment} = \left( \frac{\text{Internal Average of Each CO Attainment}}{100} \times 20\% \right) + \left( \frac{3}{100} \times 80\% \right)$$

#### PO Attainment Calculation:

$$\text{PO Attainment} = \left( \frac{\text{Average of CO-PO Mapping}}{3} \times \text{Course Attainment} \right)$$





## 10. REFERENCE

1. <https://www.nbaind.org/files/obe-and-nba-accreditation.pdf>
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