



*Internal Quality Assurance Cell*

**GOVERNMENT COLLEGE KARIAVATTOM**

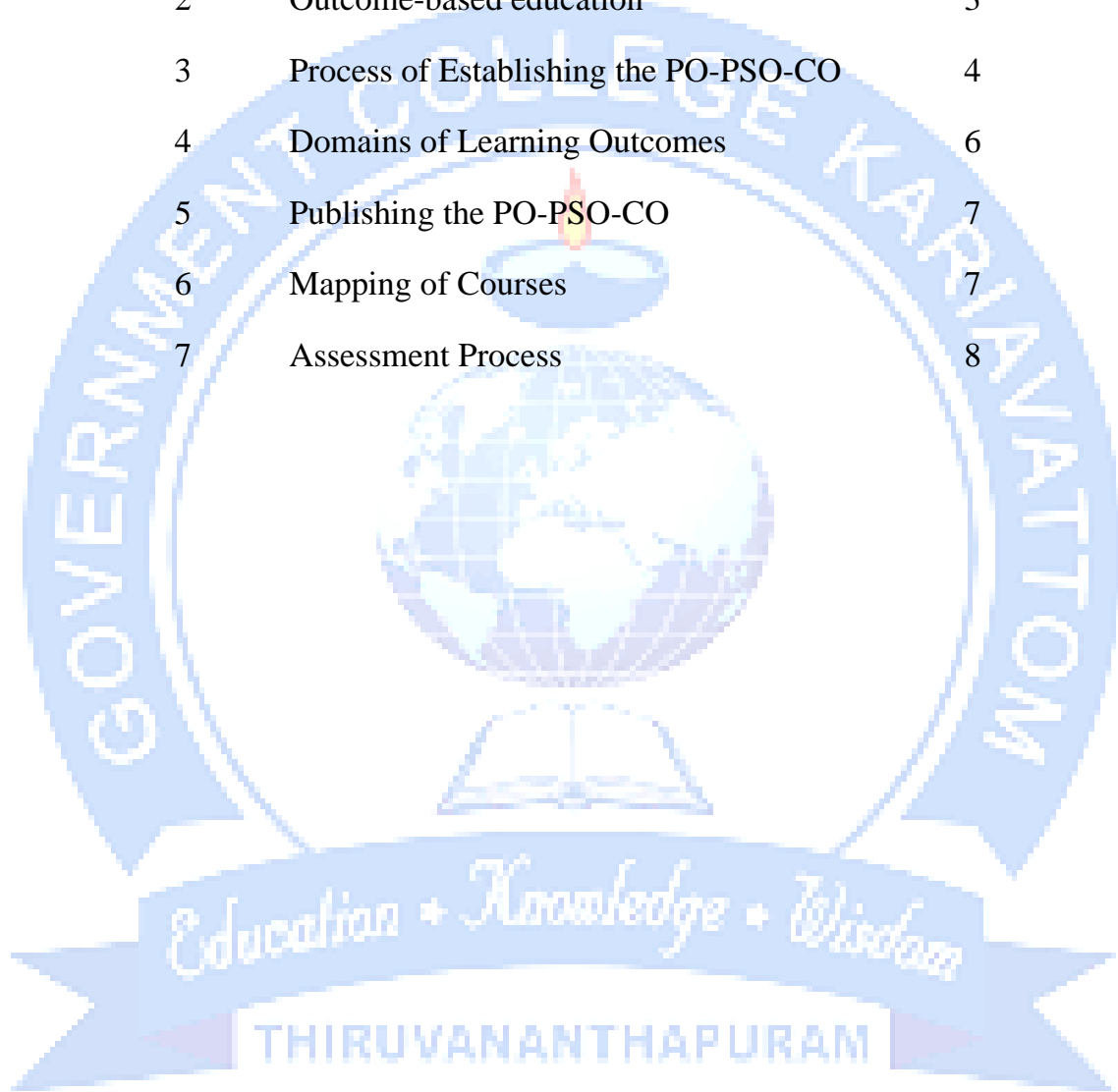
**Hand Book**  
**on**  
**Outcome Based Education**

**Prepared & Issued**  
**2022**



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# OUTCOME BASED EDUCATION

*"The only true measure of learning is the change in a learner's capacity to take effective action."*

- W. Edwards Deming

## 1. Introduction

The noble calling of educators extends far beyond imparting knowledge. It's about nurturing well-rounded individuals equipped to navigate the complexities of life and contribute meaningfully to society. The current emphasis on exams, however, often falls short in this pursuit. While marks and scores offer a snapshot of factual recall, they often fail to capture the essence of learning. True education fosters critical thinking, creativity, ethical awareness, and the ability to skillfully apply knowledge in real-world situations. The ideal educational system cultivates students with a diverse skill set. This includes strong communication skills, honed through presentations and debates. Problem-solving abilities flourish through project-based learning and tackling real-world challenges. Ethical considerations come alive through case studies and discussions. The world is constantly evolving, demanding continuous learning. Equipping students with the tools for self-directed learning empowers them to adapt and thrive throughout their lives. By embracing a more holistic approach to education, we empower not just individuals, but society as a whole. Imagine a future where graduates are not just armed with facts, but also with the ability to think critically, solve problems creatively, and navigate the complexities of a rapidly changing world. This is the true potential of education, waiting to be unlocked.

Outcome-Based Education (OBE) flips the traditional classroom on its head. Instead of focusing on what teachers deliver, OBE prioritizes what students can achieve. It outlines clear learning objectives – a combination of knowledge, skills, and attitudes – that students are expected to demonstrate by the end of a program. This focus on outcomes guides everything from curriculum design to teaching methods and assessment. Ultimately, OBE aims to create well-rounded graduates prepared for the demands of future careers and responsible citizenship. However, implementing OBE requires a shift in educational practices, including effective assessment design and teacher training to ensure a successful and engaging learning experience for both students and instructors.

Traditional exams often miss the mark, failing to capture a student's true potential – their critical thinking, practical skills, and ability to apply knowledge in real-world situations. OBE tackles this head-on. It focuses on clearly defined learning outcomes, encompassing not just knowledge, but also skills, values, and attitudes. This ensures graduates are well-rounded individuals equipped to thrive in the ever-changing job market. The University of Kerala's adoption of OBE across all programs exemplifies this exciting move towards a more effective and relevant educational system, preparing students not just for exams, but for life.

## 2. Outcome-Based Education

Outcome-based education (OBE) is an educational philosophy that flips the traditional script. Instead of focusing on how much time students spend in class or what material they cover, OBE emphasizes the results of learning. The core of OBE is defining clear learning outcomes. These outcomes outline the specific skills, knowledge, and even attitudes students should gain by the end of a course, program, or degree. The curriculum, teaching styles, and assessments are all designed to help students achieve those predetermined outcomes. There's no one-size-fits-all approach in OBE. Instructors have the freedom to choose any teaching methods (lectures, discussions or projects) that best facilitate student mastery of the outcomes. OBE emphasizes ongoing assessment to track student progress towards the outcomes. This allows instructors to identify areas where students might need more support and adjust their teaching accordingly.

### *Potential benefits of OBE:*

- **Increased student engagement:** Students can see the purpose and relevance of what they're learning, leading to higher motivation.
- **Improved learning outcomes:** By focusing on what students need to know and be able to do, OBE can ensure they acquire valuable skills and knowledge.
- **Better alignment with real-world needs:** OBE can help graduates develop the skills and knowledge employers are looking for.

### *Challenges of OBE:*

- **Standardization concerns:** A focus on measurable outcomes can lead to a more standardized approach, potentially stifling creativity and critical thinking.

- **Teacher workload:** Developing and assessing outcomes-based learning experiences can require more time and effort from teachers.
- **Unequal access to resources:** The success of OBE can depend on factors like class size and access to resources, which can vary across institutions.

Overall, OBE is a growing trend in education, aiming to make learning more **goal-oriented** and **student-centered**. It has its strengths and weaknesses, but it can be a valuable tool for ensuring students graduate with the knowledge and skills they need to thrive in the future.

### 3. Process of Establishing the PO-PSO-CO

The college uses a blended learning approach, and it makes sure that the teaching-learning process is updated in accordance with any new directions from the University of Kerala, UGC, or NAAC. Government College Kariavattom prioritizes faculty development to ensure they're equipped with the latest educational approaches. The college's Internal Quality Assurance Cell (IQAC) acts as a key driver, guiding faculty in adopting and implementing Outcome-Based Education (OBE) effectively. As a University of Kerala affiliate, this college follows the university's OBE guidelines.

The University of Kerala frames the syllabus in such a way that all students should be able to demonstrate the outcomes of the programme when they leave an affiliated college. In other words, one would determine what kind of skills, knowledge, ethics, and professionalism a student should possess after graduation, and subsequently, the courses and curriculum content would be framed focusing on those key factors. At the end of the learning process, each student must have met the learning objectives and have the same need to be demonstrated in the form of specific outcomes or skills where they can act, execute, or just perform as intended. In order to help learners achieve specific targets, OBE incorporates indirect assessment in addition to clearly defined teaching and direct evaluation methods.

The IQAC plays a proactive role, not only in establishing Program Outcomes (POs), Program Specific Outcomes (PSOs), and Course Outcomes (COs) for all programs, but also in fostering innovative methods to achieve and measure these learning objectives. There are three levels of outcomes considered in OBE Processes such as Course Outcomes (CO), Program Outcomes (PO) and Program Specific Outcomes (PSO). The university has implemented outcome-based education from 2020 and the PSOs and Cos are listed in the syllabus for each program. A

committee composed of HODs, faculty advisors and IQAC members prepares a final version by compiling the data given in the syllabus.

**Programme Outcomes (POs)** : Programme Outcomes (POs) are the cornerstones of Outcome-Based Education (OBE). They define the essential knowledge, skills, and abilities students are expected to possess upon graduation from a specific program. These outcomes go beyond mere memorization of facts, focusing on what graduates will be able to **do** in the real world. POs encompass a broad spectrum of capabilities, including technical skills specific to the program's discipline, critical thinking and problem-solving abilities, effective communication and collaboration skills, and a lifelong commitment to learning. While encompassing a wide range, POs should be clearly defined and measurable to allow for effective assessment of student achievement. Most importantly, POs should be aligned with the program's educational objectives and the learning outcomes of individual courses. This alignment ensures a cohesive learning experience that progresses logically towards the program's ultimate goal: preparing graduates for success in their chosen careers.

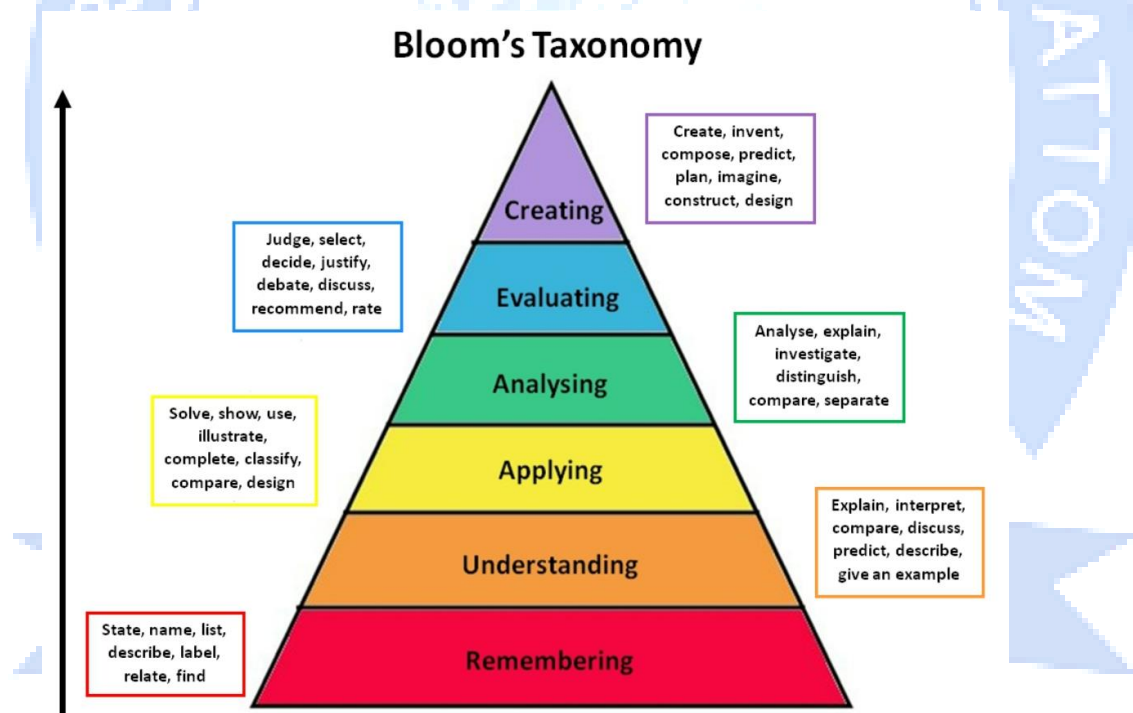
**Programme Specific Outcomes (PSOs)** delve deeper into the world of Outcome-Based Education (OBE), building on the general foundation laid by Programme Outcomes (POs). Unlike POs which apply broadly across a program, PSOs zoom in on the specifics of a particular program or specialization within a program. They define the distinct knowledge, skills, and abilities that graduates from that specific program should possess, setting them apart from graduates of similar programs elsewhere. This tailored approach ensures students acquire the specialized expertise needed for their chosen career path. PSOs also directly connect to the program's POs, demonstrating how a particular program contributes to the overall goals of the broader program. They bridge the gap between general capabilities and program-specific strengths, creating a unique value proposition for the program. For instance, a Bachelor of Science in Computer Science program might have a PO of "Demonstrate strong problem-solving skills through the application of computer science principles." A corresponding PSO could be "Design and implement innovative software solutions to address real-world problems in a specific domain, such as healthcare or artificial intelligence." In essence, PSOs provide a program's fingerprint, showcasing its distinct approach and the specialized skill set graduates will acquire.

**Course Outcomes (COs):** Course Outcome is a statement that describes what students are expected to know and be able to perform or attain upon completion of a course. Each CO contributes to the achievement of PO via curriculum design, course delivery and assessment tasks that are most appropriate to attain that CO.

#### 4. Domains of Learning Outcomes

Bloom's Taxonomy is a framework used to classify educational learning objectives into different levels of complexity. It essentially categorizes thinking skills involved in learning, from basic memorization to complex analysis and evaluation.

Domains: Bloom's Taxonomy covers three main learning domains: cognitive (thinking skills), affective (attitudes and values), and psychomotor (physical skills). However, the most well-known focus is on the cognitive domain. The cognitive domain is typically presented as a hierarchy with six levels, arranged from simplest to most complex:



Bloom's Taxonomy helps educators design clear and specific learning objectives. It helps to choose appropriate teaching methods for different levels of thinking. Also, it has a role in creating effective assessments to measure student learning.

## 5. Publishing the PO-PSO-CO

As the college is affiliated under University of Kerala, we follow the programme and course outcomes specified by the University. Besides, each department will provide few more course outcomes to supplement the learning objectives of each paper and module. If the outcome-based syllabus is not provided by the University for a particular programme, the faculties under the institution, under the supervision of IQAC will prepare and provide a desirable outcome based on the syllabus of their respective programme and their course offered. Graduates of all programmes in Government College Kariavattom are required to attain the POs identified by the University and the PSOs identified by the Board of Studies of concerned Programme.

Colleges typically publish Program Outcomes (POs), and Course Outcomes (COs) through a variety of channels to ensure transparency and student awareness. These statements might be found in course syllabi, departmental websites or even displayed in classrooms and labs. This widespread publication allows students, faculty, and accreditation bodies to understand the expected knowledge, skills, and behaviors students should acquire throughout their academic journey. Here are the methods colleges typically use to publish and disseminate PO-PSO-CO statements:

- **Printed Materials:** Course syllabi kept in the departments.
- **Digital Platforms:** College websites and department social media pages.
- **Explanations to students during orientation sessions**

## 6. Mapping of Courses

Mapping PSOs, POs, and COs is a crucial process undertaken by IQAC. It involves meticulously aligning Course Outcomes (COs), which define what students should learn in a specific class, with Program Outcomes (POs), the broader skills and knowledge graduates acquire throughout their studies. This alignment is then further connected to the Program Specific Outcomes (PSOs), the long-term career goals and societal impact the program strives to achieve. By meticulously mapping these elements, faculty ensure a cohesive learning journey, where each course contributes to the development of graduates who meet the program's overall educational goals.



The faculty advisor plays a critical role in ensuring the program aligns with its educational goals. They review the Course Outcomes (COs) and their mapping to Program Outcomes (POs) initially developed by the University. The advisor then consolidates the COs for the year/semester, maintaining documentation of both CO attainment levels and individual student involvement in extracurricular and co-curricular activities. This comprehensive data is then passed on to the Head of Department. Ultimately, it contributes to the evaluation of PO attainment for each course at the program's completion. This entire process operates under the guidance of the Internal Quality Assurance Cell (IQAC), ensuring program quality and effectiveness.

All the courses together must cover all the POs (and PSOs). For a course we map the COs to POs through the CO-PO matrix and to PSOs through the CO-PSO matrix as shown below. The various correlation levels are: “1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation “3” – Substantial (High) Correlation “0” – Indicates there is no correlation.

## 7. Assessment Process

Evaluation is an essential process for measuring the transformation that a student attains after a teaching and learning process. Course Outcome is evaluated based on the performance of students in internal assessments and in the end semester examination of a course. Internal assessment contributes 20% and end semester assessment contributes 80 % to the total attainment of a CO.

The university's delayed publication of results presents a challenge for accurately assessing Course Outcomes (COs). Since external assessments, like standardized tests, may not be available in time, the primary method of evaluating CO attainment becomes internal assessments conducted by the faculty throughout the semester. While internal assessments provide valuable insights, they lack the external validation that can strengthen the assessment process. This delay can raise concerns about the comprehensiveness of CO evaluations and potentially impact future program improvement efforts.

As a first part of evaluation of attainment we consider internal assessment methods. These Evaluation outcomes are done in two parts:

1. **The Direct Method:** The direct method of evaluation includes Internal Examinations, Assignments, Seminars and Quizzes etc.
2. **The Indirect Method:** The indirect method includes the course end survey that seeks the response or rating from students on the extent of attainment of each CO's.

### ***PROCEDURE FOR DIRECT EVALUATION (DE)***

1. **Direct Internal Evaluation (DIE)** for each CO Design the Course Outcome of each course. Conduct an Internal Examination and Assignment/seminar based on Bloom's Taxonomy levels for evaluating the attainment of Course Outcome.
2. **Indirect Evaluation (IE)** : Indirect evaluation can be done on the basis of a course Exit Survey (questionnaire) after the completion of each course. The students can rate the extent of their attainment of each CO in the range 0 to 3.
3. **TOTAL attainment score for each CO (S)** The CO attainment and its percentage is evaluated using the following formulas

**Each CO attainment value in the test paper  $S_T = (\text{Obtained mark of each CO in the Test Paper} * 7) / (\text{Total Weight of each CO in the Test Paper})$**

**Each CO attainment value in Assignment/Seminar  $S_A = (\text{Obtained mark of each CO in Assignment/Seminar} * 2) / (\text{Total Weight of each CO in Assignment/Seminar})$**

**Each CO attainment value in the Course exit survey  $S_E = (\text{Obtained mark of each CO in exit survey} * 1) / (\text{Total Weight of each CO in exit survey})$**

**Each CO attainment (%) =  $((S_T + S_A + S_E) * 10)$**

After getting each CO attainment, let us set a threshold of 50% attainment. This means that our evaluation of the outcome for the whole class of students for each CO, depends on the percentage of students obtaining 50% or above score for the respective CO. Then the threshold CO attainment percentage of students obtaining 50% or above for each respective CO is evaluated using the formula

**Threshold CO Attainment (%) = (No. of students got 50% above threshold\*100)/ (Total number of students)**

Based on the above CO attainment percentage, attainment level for each CO is evaluated using the following criteria. Calculate the percentage of students performing above the threshold for each CO in the test paper and assignment. Then we can suitably set an attainment chart as follows:

Percentage of students performing above threshold ( $x$ )	CO Attainment Score
$10 < x < 40$	1
$40 < x < 60$	2
$x > 60$	3

### **Calculation Of PO, PSO Attainment**

The CO-PO and CO-PSO relation mapping is done and the score 1-3 is assigned based on the following conditions; 3: Strongly Related, 2: Moderately Related, 1 : Related and then find the PO and PSO attainment % using the formulas:

**PO Attainment (%) = (CO attainment row \* PO column)/ sum of PO column**

**PSO Attainment (%) = (CO attainment row \* PSO column)/ sum of PSO column**

**Pattern for External End Examinations:** There shall be an external examination conducted by the University for every Theory Course and the duration of the time for this end examination is 3 hours.

**Overall Attainment:** The Final CO attainment is calculated by combining the Internal attainment and External attainment in a ratio of 20:80.