NIRMALA COLLEGE OF PHARMACY

MUVATTUPUZHA

Affiliated to Kerala University of Health Sciences, Thrissur

Approved by the Government of Kerala and PCI, New Delhi

Managed by

Nirmala College Society (Reg No. ER.928/2001)
Under Catholic Diocese of Kothamangalam

OUTCOME BASED EDUCATION (OBE) MANUAL

VERSION NO: 1

JULY 2018

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NIRMALA COLLEGE OF PHARMACY
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Kerala

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Muvattupuzha

OBE Manual

NIRMALA COLLEGE OF PHARMACY Muvattupuzha Ernakulam Dist. Kerala

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Outcome Based Education (OBE) Manual

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Abbreviations:

NCP	**Nirmala college of Pharmacy**
PCI	**Pharmacy Council of India**
OBE	**Outcome Based Education**
BTL	**Bloom's Taxonomy Level**
LOT	**Lower Order of Thinking**
HOT	**Higher Order of Thinking**
PEO	**Program Educational Objectives**
PO	**Program Outcome**
CO	**Course Outcome**
COS	**Course Outcome Statements**
PSO	**Program Specific Outcome**
HoD	**Head of Department**
A.Y	**Academic Year**
GPAT	**Graduate pharmacy aptitude test**
PAC	**Program Assessment Committee**

INTRODUCTION

Background of Nirmala College of Pharmacy:

Nirmala College of Pharmacy (NCP) is yet another hallmark of the commitment and experience of the catholic diocese of Kothamangalam in the field of education. NCP is a Christian minority institution established in 2004 as a memorial of the diocesan golden jubilee. It is managed by the Catholic diocese of Kothamangalam under Nirmala College Society. (Reg. No. ER.928/2001). At present the college is affiliated to Kerala University of Health Sciences, Thrissur. This college is approved by Govt. Of Kerala and Pharmacy Council of India (PCI), New Delhi. The college aims at the formation of students with academic excellence coupled with integrity of character. It provides excellent infrastructural facilities with all modern amenities, a dedicated and experienced faculty with a vision to develop the institution into a full-fledged pharma-research Centre. **Mar George Madathikandathil**, Bishop of Kothamangalam is the Patron and **Rev. Dr. Msgr. Pius Malekandathil** is the President. The foundation stone of the college was laid by **Mar George Punnakottil**, the Patron on 19th March 2004. The College was inaugurated by **Sri. Vayalar Ravi**, Union Cabinet Minister for Overseas Affairs on 15th March 2009. The New block of the college was blessed by **Mar. George Madathikandathil**, Bishop of Kothamangalam diocese and inaugurated by **Sri. P.J. Joseph** Honourable Minister for Water Resources on 22nd May 2015.U.G Pharmacy course is accredited by NBA till 2025.

Definition and Importance of Outcome-Based Education:

Outcome-Based Education (OBE) is an educational approach that focuses on defining clear and measurable learning outcomes for students. Instead of primarily emphasizing what is taught or covered in a course, OBE centers on what students are expected to know and be able to do at the end of a learning experience. The fundamental idea is to design educational programs, courses, and assessments based on predetermined outcomes, fostering a more student-centered and results-oriented approach.

Key components of Outcome-Based Education include:

Learning outcomes: Clearly defined statements that describe the knowledge, skills, attitudes, and competencies that students are expected to acquire by the end of a learning experience

Alignment: Ensuring that all elements of the educational process, including curriculum, instructional methods, and assessments, are aligned with the stated learning outcomes.

Assessment: Utilizing various assessment methods to measure the extent to which students have achieved the specified learning outcomes. Assessment is an integral part of OBE, providing feedback for improvement.

Continuous Improvement: Emphasizing ongoing evaluation and enhancement of educational programs based on assessment results, with the goal of improving the overall quality of education.

Student-Centered Approach: Placing the focus on the learner, their needs, and their ability to demonstrate mastery of outcomes. This encourages active participation and engagement in the learning process.

Transparency: Communicating learning outcomes to students, educators, and other stakeholders, promoting transparency and accountability in the educational process.

Flexibility: Allowing for flexibility in teaching methods and curriculum design as long as they contribute to the achievement of the desired learning outcomes.

It aims to enhance the relevance and effectiveness of education by clearly defining the expected results and aligning instructional practices to achieve those results. The approach supports the development of students' critical thinking, problem-solving skills, and real-world application of knowledge.

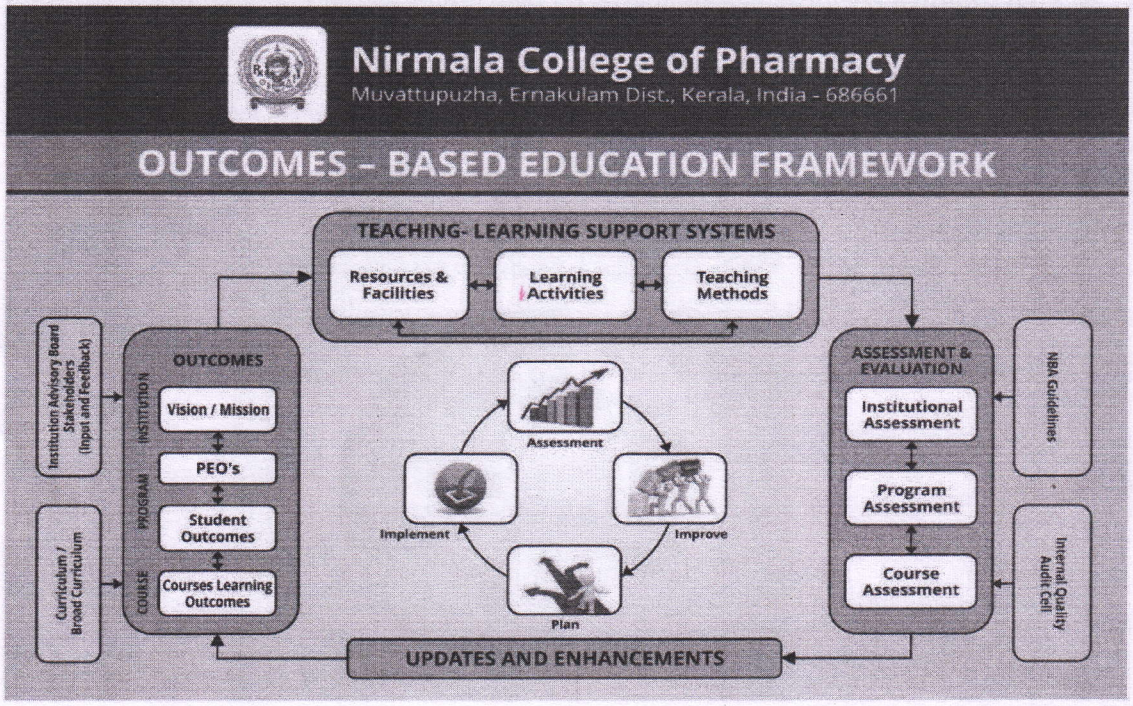
The purpose of an Outcome-Based Education (OBE) manual is to provide a comprehensive guide for educators, administrators, and stakeholders involved in the educational process. The manual serves as a reference document that outlines the principles, processes, and practices associated with Outcome-Based Education within a specific educational institution, such as Nirmala College of Pharmacy. An OBE manual serves as a comprehensive and centralized resource that empowers educational institutions to implement, monitor, and continuously improve Outcome-Based Education. It ensures consistency, transparency, and effectiveness in the delivery of education while aligning with the overarching goals and vision of the institution.

Specific Goals of Outcome-Based Education at Nirmala College of Pharmacy

We are committed to accomplish the following objectives that enable students to -

1. Pursue knowledge with an insatiable thirst:
2. Discipline them to harness their energy for creative purposes;
3. Make them physically and mentally fit and competent for career and
4. Equip them to be self-supportive in life

Key Concepts of Outcome-Based Education



Learning outcomes

Learning outcomes are specific, measurable, and observable statements that describe what learners are expected to know, understand, or be able to do as a result of a learning experience. These outcomes serve as explicit indicators of the knowledge, skills, attitudes, and competencies that students should acquire by the end of a course, program, or educational activity. Learning

Vision, Mission and Core Values

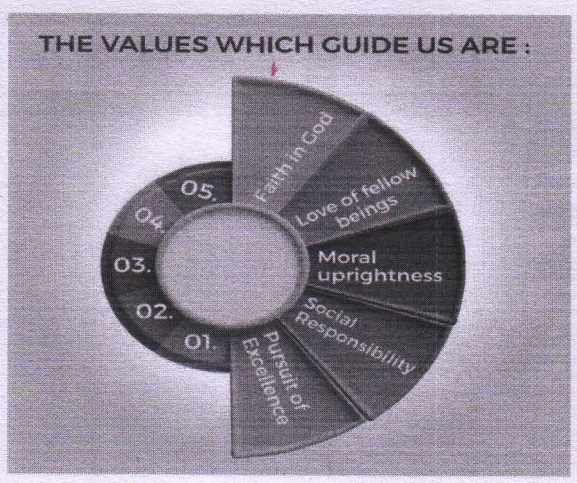
Vision

A centre of Excellence for Pharmacy education and research, moulding students with value integration and social commitment.

Mission

- To develop students with intellectual and professional competence to meet challenges of technology, industry and services.
- To promote research and development in basics and frontier areas to solve the complexity of the health care system.
- To evolve and disseminate appropriate Pharmacy Practices.
- To develop socially committed and responsible Professionals by inculcating ethical values.
- To improve performance standards by benchmarking and internal drive

CORE VALUES



outcomes are a crucial component of Outcome-Based Education (OBE) and are used to guide curriculum design, teaching strategies, and assessment methods

Key characteristics of learning outcomes include:

Specificity: Learning outcomes are clear and specific, leaving no room for ambiguity. They outline precisely what is expected of the learners.

Measurability: Learning outcomes should be measurable and observable, allowing for assessment and evaluation of student achievement. This often involves the use of quantitative or qualitative indicators.

Relevance: Learning outcomes should be directly tied to the goals and objectives of the educational program. They should reflect the essential knowledge and skills relevant to the discipline or subject matter.

Attainability: Learning outcomes should be realistic and achievable within the given context of *the learning experience. They should consider the abilities and developmental level of the learners.*

Time Frame: Learning outcomes often include an indication of when the achievement is expected, whether it's by the end of a course, program, or specific timeframe.

Action Verbs: Learning outcomes are often expressed using action verbs that describe observable behaviors. Common action verbs include "demonstrate," "analyze," "synthesize," "evaluate," and "apply."

Learning outcomes play a crucial role in guiding educators in curriculum design, instructional planning, and assessment strategies to ensure that educational goals are achieved effectively.

The program outcomes

Program outcomes in the context of a Pharmacy program refer to the specific knowledge, skills, and attributes that students are expected to acquire by the completion of their education. These outcomes are designed to prepare graduates for success in the field of pharmacy. The significance of a Pharmacy program lies in its contribution to producing competent and qualified professionals who play crucial roles in the healthcare system. Here are the program outcomes and the significance

PO1: Pharmacy Knowledge: Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing

PO2: Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO3: Problem Analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically

PO4: Modern tool usage: Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

PO5: Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment of practice, professional and societal responsibilities

PO6: Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees

PO7: Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles.

PO8: Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

PO9: The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

PO10: Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PO11:Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

The significance of a B.Pharm, Pharm D and M.Pharm programs lies in its ability to produce well-rounded, competent professionals who positively impact the healthcare system through their knowledge, skills, and commitment to patient care and pharmaceutical advancements.

The program specific outcomes for B.Pharm

PSO.1 Students will be able to become experts in drug and formulation development, manufacturing, and quality control since they acquire a strong foundation of the underlying principles.

PSO.2 Students will be able to ensure the safety and efficacy of pharmaceutical products as they familiarize themselves with pharmaceutical regulations, quality assurance, and compliance standards

PSO.3 Students will be able to emerge as competent and compassionate healthcare professionals who can contribute to the well-being of individuals and communities through the safe and effective use of pharmaceuticals.

PSO.4: Students will be able to identify business opportunities, initiate entrepreneurship, and contribute as a reliable resource for research, consultation, and training.

The program specific outcomes for Pharm D:

PSO.1: Possess extensive knowledge in various domains of pharmacy practice through continuous learning and collaboration with other healthcare team members, which enable them to meet the challenges of society.

PSO.2: Ability to interpret and optimize the drug therapy of patients by formulating individualized treatment plan to ensure patient safety.

PSO.3: Have excellent professional skills in academic and research activities that enable them to provide better pharmaceutical care through outreach programs

The program specific outcomes for M.Pharm Pharmaceutics:

PSO.1: Possess extensive knowledge in various domains of Pharmaceutics which enable them to meet professional challenges with credibility, integrity, ethical standards and social responsibility

PSO.2: Adhere the highest standards of professionalism to achieve excellence in academic, industrial and research activities through interdisciplinary and collaborative programs

PSO.3: Develop an expertise in formulation and production of conventional and novel drug delivery systems, cosmetic science, QC and QA, packaging material science, drug regulatory affairs etc

The program specific outcomes for M. Pharm Pharmacology

PSO.1: To gain knowledge and technical skill to perform In-vitro and In-vivo studies, and professional training to the students to work on drug compounds and develop new medications based on research.

PSO.2: Understand, apply, cellular and molecular pharmacology, pathophysiology to the pharmacotherapy of certain diseases and mechanism of drug actions.

PSO.3: Understand, appreciate and apply concepts about various aspects of regulations and ethical requirement for the usage of experimental animals, CPCSEA guidelines for laboratory animal facilities, and toxicity studies and to create a talent pool by involving

PSO 4: Understand, appreciate and apply concepts of principles of drug discovery, clinical research and pharmacovigilance, research methodology & biostatistics systematically in research.

The program specific outcomes for M.Pharm Pharmacy practice:

PSO.1: Possess extensive knowledge in various domains of pharmacy practice through continuous learning and collaboration with other healthcare team members, which enable them to meet the challenges of society.

PSO.2: Ability to interpret and optimize the drug therapy of patients by formulating individualized treatment plan to ensure patient safety.

PSO.3: Have excellent professional skills in academic and research activities that enable them to provide better pharmaceutical care through outreach programs.

PSO 4: Proficient to excel in Industry oriented activities such as clinical research, regulatory affairs, pharmacovigilance and so on

Blooms taxonomy and its relevance

Bloom's Taxonomy is a hierarchical framework that classifies educational objectives and cognitive skills into a series of levels. Developed by Benjamin Bloom and a group of educational psychologists in the 1950s, the taxonomy is structured into six levels, arranged in ascending order of complexity. These levels, often depicted as a pyramid, provide a systematic way to understand and categorize cognitive processes involved in learning and education.

The six levels of Bloom's Taxonomy, from the simplest to the most complex, are

Remembering

Recognizing or recalling facts, concepts, or information.

Example: Recalling names of certain medicinal compounds

Understanding

Demonstrating comprehension and the ability to interpret or explain concepts.

Example: Explaining the main idea of a text in one's own words.

Applying

Applying acquired knowledge and understanding to solve problems or complete tasks.

Example: Using mathematical formulas to solve real-world problems.

Analysing

Breaking down information into its parts, examining relationships, and identifying patterns.

Example: Analyzing the causes and effects of a drug interaction

Evaluating

Making judgments based on criteria and standards, often involving critical thinking.

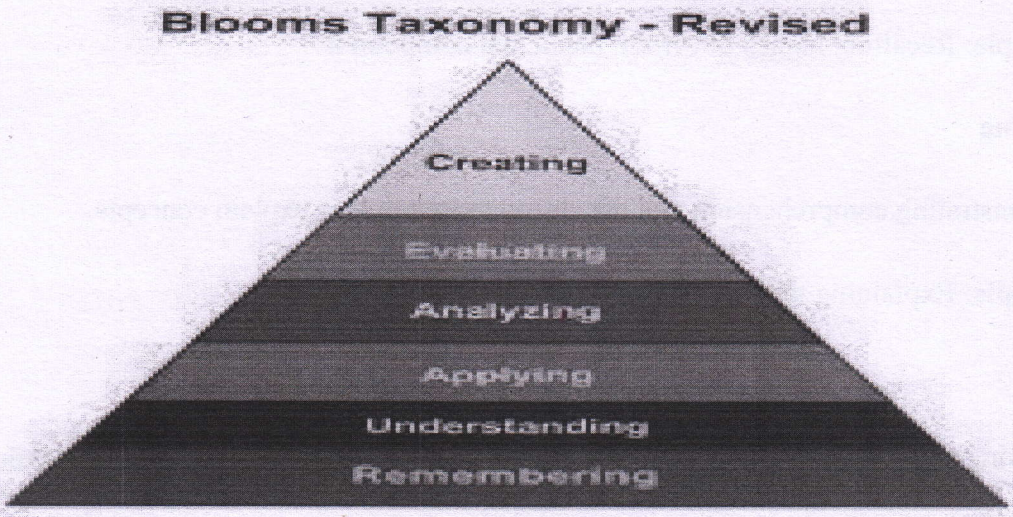
Example: Evaluating the effectiveness of a drug formulation or a scientific experiment.

Creating

Generating new ideas, products, or ways of thinking.

Example: Designing a solution to a complex problem.

Bloom's Taxonomy is a valuable tool in education as it provides a structured approach to setting learning objectives, designing assessments, and fostering the development of critical thinking skills in learners.



Cognitive process dimensions and categories of learning

Cognitive processes and categories of learning are concepts that are often discussed in the field of education and psychology. These terms are used to describe the mental processes and ways in which individuals acquire knowledge and skills. Here are explanations of cognitive process dimensions and categories of learning.

Cognitive process Dimensions

1. **Cognitive processes**: Cognitive processes refer to the mental activities and operations involved in acquiring, processing, storing, and using information.

Dimensions:

Memory: The ability to store and retrieve information

Attention: Focusing mental resources on specific stimuli or tasks

Language: The use of language for communication and thought

Problem solving: The ability to find solutions to complex issues

Critical thinking: Analyzing and evaluating information and arguments

Creativity: Generating new ideas or approaches

2. **Metacognition**: Metacognition involves thinking about one's own thinking processes, understanding how to approach learning tasks, and monitoring one's own cognitive performance

   Dimensions:

   Planning: Setting goals and planning strategies for learning

   Monitoring: Checking and evaluating one's understanding during a task

   Evaluation: Assessing the success of learning strategies used

3. **Perception**: Perception involves interpreting and making sense of sensory information from the environment

Categories of learning

1. **Cognitive learning**: Cognitive learning involves the acquisition of knowledge, understanding, and the development of intellectual skills

   Categories:

   - Declarative/ Factual knowledge: Factual information and concepts
   - Procedural knowledge: Knowing how to perform tasks or procedures
   - Conceptual knowledge: Understanding of concepts, principles, and overarching ideas within a particular domain

- Conditional Knowledge: Understanding when and why to use certain knowledge and skills

2. **Affective learning**: Affective learning involves the development of attitudes, values, and emotional responses.

   Categories

   Attitudes: Feelings and evaluations toward people, objects, or ideas

   Values: Beliefs about what is important or desirable

   Emotional responses: Emotional reactions to stimuli or situations

3. **Psychomotor learning**: Psychomotor learning involves the acquisition of motor skills and coordination.

   Categories:

   Basic motor skills: Fundamental movements

   Perceptual abilities: Coordination of sensory input and motor responses

   Physical abilities: Development of physical strength and endurance

4. **Social learning** : Social learning involves acquiring knowledge and skills through observation, modeling, and interaction with others.

   Categories:

   Observational learning: Learning by watching others

   Imitation: Copying the behavior of others

   Social interaction: Learning through collaboration and communication

Understanding these cognitive process dimensions and categories of learning is crucial for educators and psychologists as it helps inform instructional strategies, assessment methods, and the design of learning experiences that address the diverse ways individuals acquire and apply

Guidelines for writing Course Outcome Statements

Course Outcome Statements (COS) are essential components of any educational program, providing a clear description of what students are expected to learn and achieve by the end of a course. Here are some guidelines for writing effective Course Outcome Statements

Align with Program Outcomes:

Ensure that your COS aligns with the broader program outcomes. This helps maintain consistency and coherence throughout the curriculum

Be Clear and Specific: Clearly articulate what students will know or be able to do by the end of the course. Use specific language that leaves no room for ambiguity. Avoid vague terms that can be interpreted in different ways.

Use Action Verbs: Start each outcome statement with a strong, measurable action verb. This makes it clear what students are expected to accomplish. Examples of action verbs include "analyze," "synthesize," "apply," "evaluate," "create," and "demonstrate

Measurable and Observable: Make sure that the outcomes are measurable and observable. This makes assessment and evaluation more straight forward.

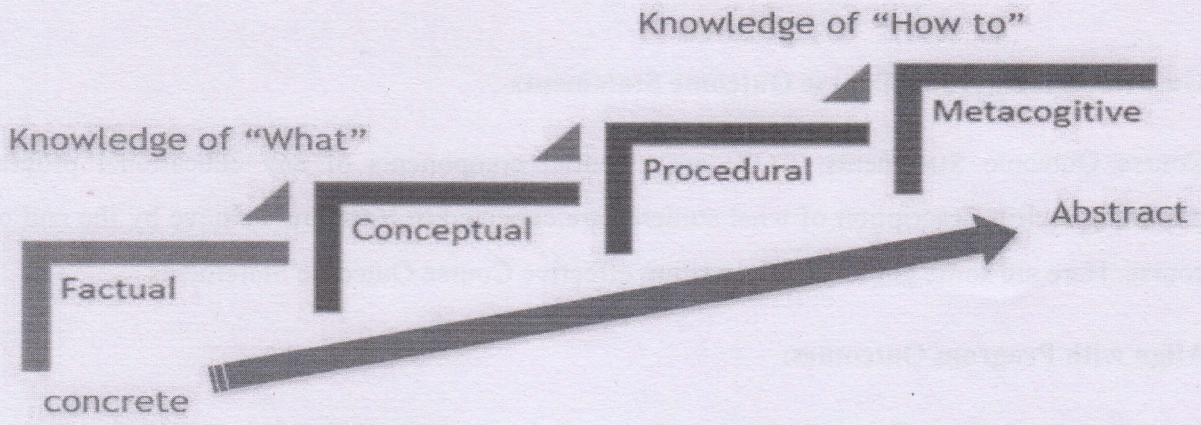
Focus on Higher-Order Thinking Skills: Emphasize higher-order thinking skills such as analysis, synthesis, evaluation, and application. These skills are crucial for deeper understanding and critical thinking.

Include a Variety of Outcomes: Incorporate a mix of knowledge, skills, and attitudes. This ensures a well-rounded set of outcomes that address different aspects of learning.

Consider Bloom's Taxonomy: Refer to Bloom's Taxonomy to guide the level of cognitive complexity in your outcome statements. Start with lower-order thinking skills and progress to higher-order skills as appropriate for the course

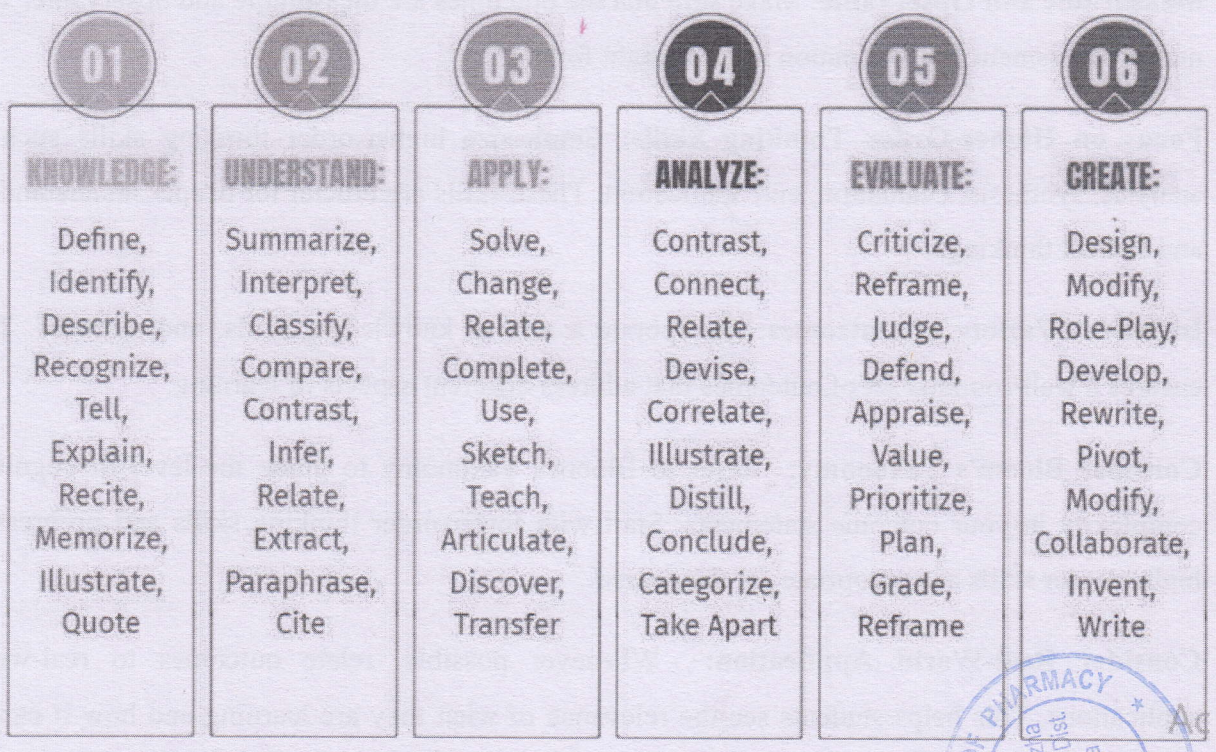
Consider Real-World Application: Whenever possible, relate outcomes to real-world applications. This helps students see the relevance of what they are learning and how it can be applied beyond the classroom.

knowledge and skills.



	Knowledge Dimension		
Cognitive Process Dimension	Factual Knowledge	Conceptual Knowledge	Procedural Knowledge
Remember	List	Describe	Reproduce
Understand	Summarize	Interpret	Clarify
Apply	Classify	Model	Execute
Analyze	Order	Explain	Integrate
Evaluate	Appraise	Assess	Critique
Create	Generate	Assemble	Design

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



Be Concise: Keep each outcome statement concise and to the point. Avoid unnecessary elaboration or complexity that may confuse students or educators.

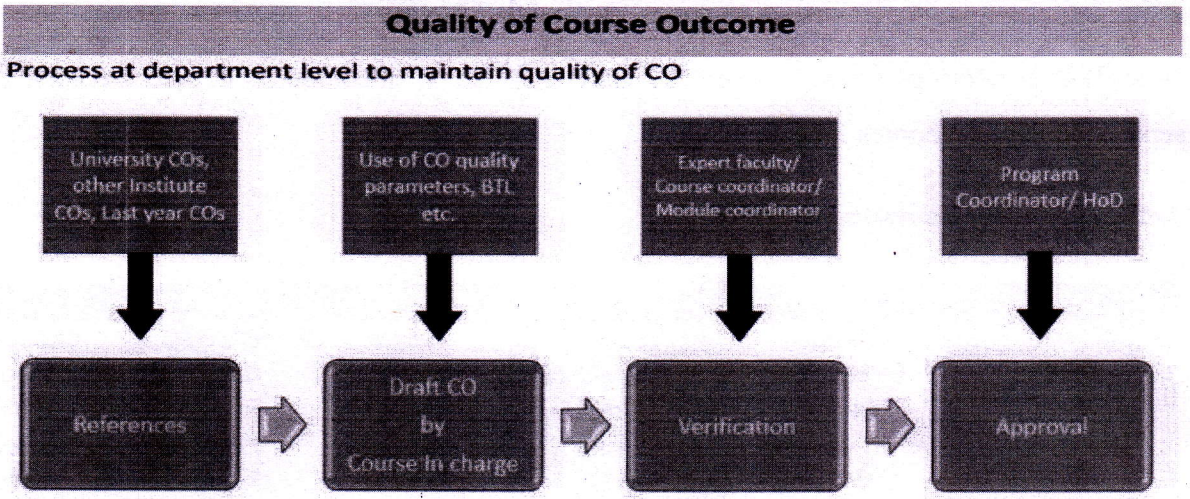
Review and Revise: Regularly review and revise the COS to ensure they remain current and aligned with the evolving needs of the course and industry standards

Note: If Laboratory practical is given as separate course (with course code) then there should be separate course outcomes for practical

Action verbs for course outcomes:

Remembering	Understanding	Applying	Analysing	Evaluating	Creating
acquire	arrange	apply	analyse	appraise	calculate
choose	categorize	calculate	appraise	argue	change
collect	change	change	break down	assess	combine
complete	chart compile	choose	classify	compare	compose
copy	conclude	classify	combine	conclude	constitute
define	convert	compute	compare	contrast	create
describe	defend	conduct	contrast	critique	derive
detect	determine	construct	criticize	decide	devise
distinguish	diagram	demonstrate	deduce	discriminate	discover
duplicate	differentiate	develop	defend	interpret	document
find	document edit	discover	detect	judge	generalize
identify	estimate	employ	differentiate	justify	modify
indicate	explain	generalize	distinguish	recommend	originate
isolate	extrapolate	manipulate	evaluate	relate	plan
label	formulate	modify	formulate	standardize	produce
list	generalize	operate	generate	validate	rearrange
mark	give example	organize	illustrate		relate
match	illustrate	predict	infer		revise
name order	interpret	prepare	outline		signify
outline place	organize	produce	paraphrase		specify
recall recognize	paraphrase	relate	plan		synthesize
reproduce select	predict	restructure	relate		tell
state underline	prepare	show	save		write
	relate	solve transfer	separate		
	summarize	use	shorten		
	update		structure		
			subdivide		

Quality of Course outcomes



Guidelines/Checklist for Cos:

Number of COs	2 to 4
CO essentials	Action Verb, Action Verb, Subject Content, Level of Achievement, Modes of Performing task (If Applicable)
Based on BTL	Understand, Remember, Apply, Analyse, Evaluate, Create
Number of BTL Considered in one course	Minimum 3
Technical Content/ point of curriculum	All curriculum contents are covered
Curriculum gap	Additional CO for gap identified/filling

CO-PO Mapping guidelines

Course Outcome-Program Outcome (CO-PO) mapping is a process that involves aligning the specific outcomes of individual courses with the broader outcomes of the overall academic program. This mapping helps ensure that courses contribute meaningfully to the achievement of program-level goals. Here are some guidelines for CO-PO mapping:

Understand Program Objectives: Before mapping, thoroughly understand the program objectives and outcomes. These are typically stated in the program curriculum or accreditation standards.

Review Course Outcomes (COs): Review and clearly define the Course Outcomes (COs) for each course. These outcomes should articulate what students are expected to know or be able to do by the end of the course.

Identify Corresponding Program Outcomes (POs):

Identify the Program Outcomes (POs) that are most directly related to the content and goals of each course. POs are often overarching statements representing the knowledge, skills, and attitudes students are expected to acquire by the end of the program.

Use a Matrix or Table:

Create a matrix or table that aligns COs with corresponding POs. This matrix visually represents the relationship between the specific course-level outcomes and the broader program-level outcomes.

Align Levels of Bloom's Taxonomy:

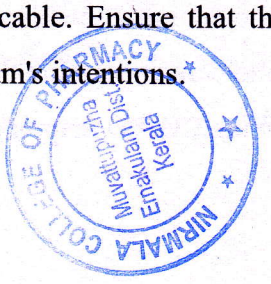
Ensure that the cognitive levels specified in the COs align with those specified in the POs. For example, if a program outcome requires critical thinking, the corresponding course outcomes should also emphasize critical thinking skills.

Ensure Comprehensive Coverage:

Aim for comprehensive coverage. Ensure that each program outcome is addressed by multiple courses and that each course outcome contributes to the achievement of several program outcomes.

Prioritize Essential Alignments: Prioritize alignments that are essential for achieving program goals. Some course outcomes may have stronger connections to certain program outcomes, and these should be emphasized in the mapping.

Validate with Stakeholders: Validate the CO-PO mapping with stakeholders, including faculty members, program coordinators, and industry professionals if applicable. Ensure that there is consensus on the alignment and that it accurately reflects the curriculum's intentions.



Update Periodically: Periodically review and update the CO-PO mapping. Courses and programs evolve, and mapping should be a dynamic process that reflects changes in curriculum, industry needs, and educational objectives.

By following these guidelines, an effective CO-PO mapping can be developed that enhances the cohesiveness of their programs and ensures that individual courses contribute meaningfully to the broader educational objectives.

CO-PO mapping matrix

Creating a CO-PO mapping matrix involves organizing Course Outcomes (COs) and Program Outcomes (POs) in a table format to visually represent the alignment between them.

Here's an example of how you might structure a CO-PO mapping matrix

COs	POs												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	-	-	-	-	-	-	-	1	2	-
CO2	2	2	2	1	3	-	-	-	-	-	-	-	1	2	-
CO3	3	3	2	2	3	-	-	-	-	-	-	-	2	3	-
CO4	2	2	1	1	3	-	-	-	-	-	-	-	1	3	-
CO5	3	3	2	2	3	-	-	-	-	-	-	-	2	3	-

When filling in the matrix, indicate the relationships between specific course-level outcomes and the broader program-level outcomes. This matrix can serve as a visual guide for curriculum development, assessment, and continuous improvement efforts. Ensure that each CO aligns with one or more Pos.

CO-PO mapping justification guidelines

When creating a Course Outcome-Program Outcome (CO-PO) mapping, it's important to provide a justification for the alignment between specific course-level outcomes and the broader program-level outcomes. Justifying the mapping enhances transparency, accountability, and helps stakeholders understand the rationale behind the chosen alignments. Here are some guidelines for justifying CO-PO mapping

Use Clear and Specific Language: Clearly articulate why each course outcome is aligned with a particular program outcome. Avoid vague statements and use specific language to convey the relationship.

Reference Course Content: Refer to specific elements of the course content that directly support the chosen program outcomes. This could include key topics, skills, or experiences that contribute to the development of the broader competencies.

Highlight Skill Development: Emphasize how the achievement of each course outcome contributes to the development of specific skills or competencies outlined in the program outcomes. Explain how these skills are essential for success in the field

Align with Course Objectives: Connect the CO-PO mapping to the objectives of the course. Explain how achieving the course outcomes aligns with the overall goals and objectives of the course.

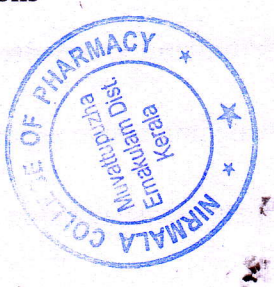
Consider Bloom's Taxonomy: Discuss the cognitive levels addressed in both the course and program outcomes. Explain how the course outcomes build upon lower-order thinking skills and contribute to the development of higher-order thinking skills specified in the program outcomes.

Address Sequential Learning: If applicable, justify the mapping based on a sequence of learning experiences. Explain how the course outcomes are designed to build upon each other and how they collectively contribute to the attainment of program-level goals.

Reference Industry Standards: If relevant, justify the mapping by referencing industry standards, accreditation requirements, or professional expectations. This provides external validation for the alignment

Incorporate Feedback: If there has been feedback from stakeholders, industry professionals, or accreditation bodies, incorporate this feedback into the justification. Explain how the CO-PO mapping responds to external input and aligns with expectations.

Demonstrate Stakeholder Involvement: If there has been feedback from stakeholders, industry professionals, or accreditation bodies, incorporate this feedback into the justification. Explain how the CO-PO mapping responds to external input and aligns with expectations



By following these guidelines, you can provide a robust and well-justified rationale for the Course Outcome-Program Outcome mapping, ensuring that the alignment is meaningful and contributes to the overall success of the educational program.

Teaching-Learning Strategies

Innovative teaching and learning methods play a crucial role in engaging students, fostering critical thinking, and preparing them for the challenges of the 21st century. Some innovative approaches to teaching and learning practiced by Nirmala College of Pharmacy include

Project based learning

Students work on real-world projects that require critical thinking, problem-solving, and collaboration

Encourages inquiry and exploration

Flipped classroom:

Students learn basic concepts through online materials before class

Class time is then used for discussions, problem-solving, and application of knowledge

Gamification

Integrate game elements into the learning process to make it more engaging

Use of rewards, points, and competition to motivate students

Blended learning

Combine traditional face-to-face teaching with online resources and activities

Allows for a personalized and flexible learning experience

Virtual and augmented reality

Create immersive experiences for students to explore concepts in a virtual environment

Enhances visualization and understanding of complex subjects

Collaborative learning

Promote teamwork and collaboration among students

Use of group projects, discussions, and peer teaching

Personalized learning

Tailor teaching methods and content to meet individual student needs

Utilize adaptive learning technologies

Mind mapping and concept mapping

Visual tools that help students organize and connect ideas

Enhances understanding and promotes creative thinking

Experiential learning

Learning through hands-on experiences and real-world applications

Internships, field trips, and simulations

Peer teaching and mentoring

Encourage students to teach concepts to their peers

Enhances understanding and communication skills

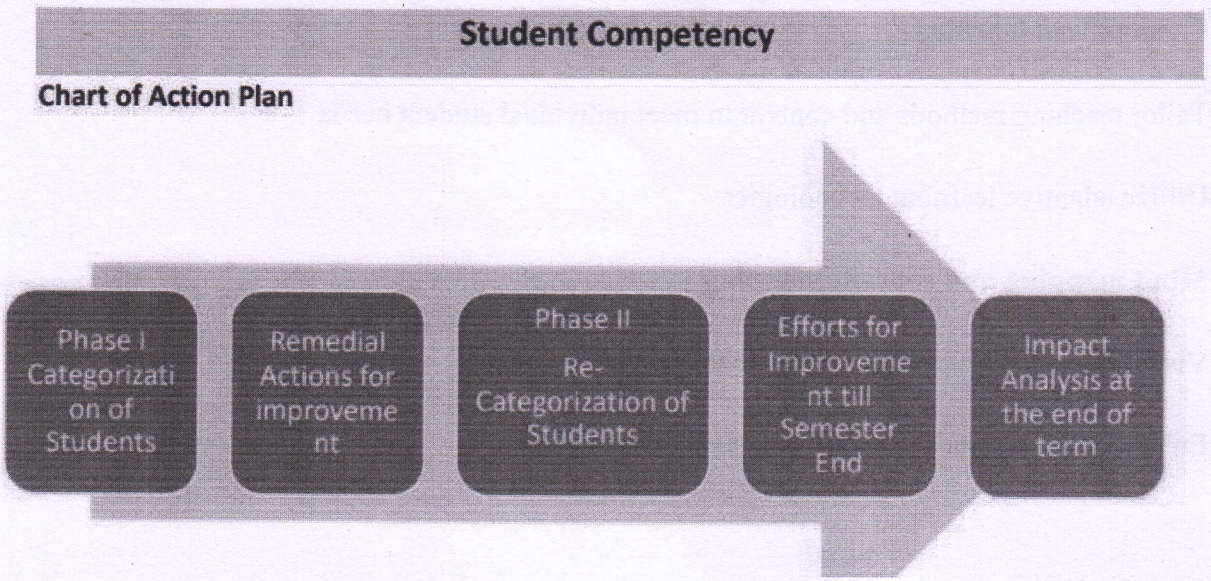
Interactive white boards and technology integration

Use interactive whiteboards, tablets, and other technology to enhance presentations and engage students

Interactive simulations and educational apps

Incorporating a mix of these innovative teaching and learning methods can cater to different learning styles, enhance student engagement, and better prepare students for the challenges they will face in the future.

Student Competency



Base Score for student category

80% - Advanced Learners

60-80%-Average learners

Less than 60%-- Slow learners

Strategies for Slow, Average and Advanced Learners

For Slow learners

- Document/record of remedial classes with timetable & attendance
- Specially designed assignment/ task
- Student study group for peer to peer learning
- Individual Counseling
- Student help desk

Note: Remedial sessions should be conducted once every week

For Average Learners

- Additional assignment/ task
- Encouraging for timely and effective completion of work
- Conduction of quiz, orals etc.
- Solving previous year University question papers and test papers

➢ Presentation on technical topics/ case studies/mini projects

Note: Activities should be on continuous basis

For Advanced Learners

➢ Encouraging to present & publish papers in journals/conferences/competitions

➢ Guidance for GATE/ competitive Examination

➢ Encouraging to participate in professional activities

➢ Special designed activities to improve the portfolio of students.

➢ Special guidance for career building

Note: Activities should be on continuous basis.

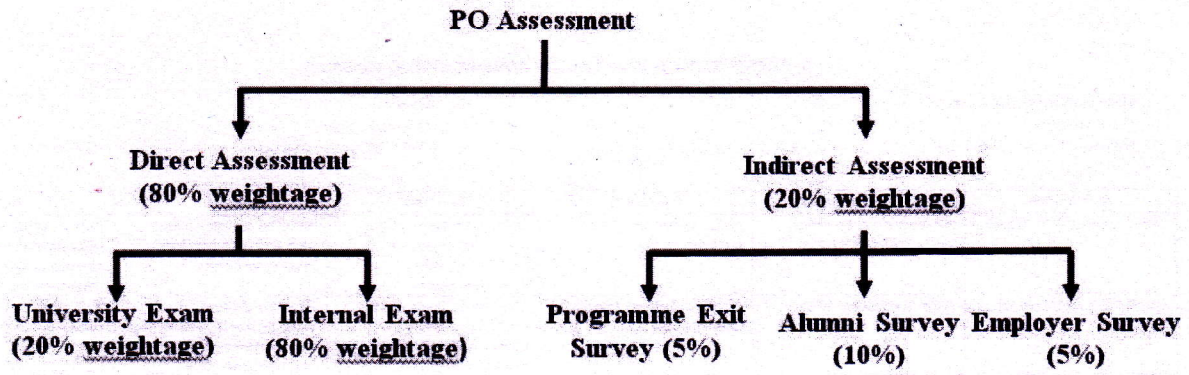
Assessment Tools and Rubrics for Assessment

Assessment tools are instruments or methods used to measure and evaluate the knowledge, skills, abilities, or characteristics of individuals or groups. These tools play a crucial role in, helping the faculty members, parents and management to understand the progress and achievements of students. We employ the following assessment tools in Nirmala College of Pharmacy.

DIRECT ASSESSMENT TOOLS			
Course Type		**Assessment Tools**	**Minimum Frequency**
Theory		Continuous assessment	Continuous
		Sessional exams	Thrice per course for year system and twice per course for semester system.
		University Exam	Once per course.
Practical		Daily Performance & viva	Every lab session
		Sessional Lab exam	Twice per course for semester system and thrice per course for year system
		University Exam	Once per course
Project	Phase I	Review	Once per course
	Phase II	Presentation	Once per course
		Evaluation by Guide and external examiner	Continuous evaluation, interim evaluation and final evaluation

INDIRECT ASSESSMENT TOOLS		
Method	**Assessment Tools**	**Minimum Frequency**
Surveys	Graduate Exit Survey	Once in every year
	Alumni Survey	Once in every year
	Employer Survey	Once in every year

PO Assessment tools:



Indirect PO assessment Tools

- Program Exit Survey
- Alumni Survey
- Employer Survey of Alumni

When selecting or designing assessment tools, it is crucial to consider the specific learning objectives, the nature of the content, and the desired outcomes. Our well-rounded assessment strategy involves a mix of these tools to provide a comprehensive understanding of students' capabilities.

Rubrics for Assessment

Rubrics are scoring tools that provide a systematic and consistent way to evaluate student performance based on predefined criteria. They are valuable for assessing a variety of tasks, including assignments, projects, presentations, and discussions. Rubrics are used to examine how well students have met CO or PO rather than how well they perform compared to their peers. Rubrics typically include measurable descriptors that define expectations at each level of performance for each criterion.

PRESENTATION (VERBAL COMMUNICATION) RUBRICS

Name of the student: ID No.:
Course Name: Course code:
Name of evaluator: Date of presentation:

Attributes	5 – Very Good	4 – Good	3 – Fair	2 – Weak	1 - Very weak
Clear delivery of ideas	Able to deliver ideas with great clarity	Able to deliver ideas clearly	Able to deliver ideas fairly clearlyand require minor improvements	Able to deliver ideas and require further improvements	Not able to deliver ideas clearly and require major improvements
Confident delivery of ideas	Able to deliver ideas with great confidence	Able to deliver ideas confidently	Able to deliver ideas fairly confidently and require minor improvements	Able to deliver ideas with limited confidence and require further improvements.	Not able to deliver ideas confidently
Effective and articulate delivery of ideas	Ability to deliver ideas with great effect and articulate	Able to deliver ideas effectively and articulately	Able to deliver ideas fairly effectively and require minor improvements	Able to deliver ideas with limited effect and require further improvements	Not able to deliver ideas effectively
Understand and respond to questions	Able to fully understand and respond to questions very well	Able to respond to questions well	Able to understand and answer questions satisfactorily	Able to deliver ideas with limited effectand require further improvements	Not able to understand and respond to a question
Adapt delivery to audience level	Able to fully deliver ideas appropriately very well	Able to deliver ideas appropriately to the target audience well	Able to deliver ideas appropriately to the target audience Satisfactorily	Able to deliver ideas with limited appropriateness to the target audience and require further improvements	Not able to deliver appropriately to the audience level

Total Score: _____/25* *The total 25 marks will be converted according to individual course assessment weightage

Continuous Improvement:

Continuous improvement is a fundamental aspect of Outcome-Based Education (OBE), ensuring that educational institutions evolve and enhance their processes to achieve optimal outcomes. Nirmala college of Pharmacy, embrace a culture of Continuous improvement in Outcome-Based Education (OBE) as it is not a static framework but a dynamic and adaptive approach to learning. The essence of OBE lies not only in achieving predetermined outcomes but also in the ongoing process of evaluation, reflection, and refinement. Continuous improvement, therefore, becomes the lifeblood of an effective OBE system in Nirmala College of Pharmacy.

Embracing a culture of continuous improvement ensures that OBE remains relevant, responsive, and impactful, ultimately fulfilling its promise of equipping students with the skills and knowledge needed for success in a rapidly changing world. As Nirmala college of Pharmacy commit to this journey of perpetual enhancement, the benefits will extend not only to students but also to the broader community and society as a whole. The system we practice for continuous improvement is given as a table below.

Continuous Improvement

A) Contribution of CO in PO attainment and Continuous Improvement (Faculty Level)

Outcome	Action to be taken by faculty
All CO-PO attained highly (>2.5 out of 3)	Set new higher targets or attainment levels for next Academic Year (A.Y.).
All CO-PO attained moderately (1.8 to 2.49 out of 3)	Record observations, Continue action plan of last A.Y. with plan for improvements.
All CO-PO attained lowly (0.9 to 1.79 out of 3)	Record observations, assess the target set, revise/improve action plan of last A.Y. to achieve the attainment with plan for improvements.
CO-PO not attained, poor performance (<0.9 out of 3)	Record observations, Critical assessment of target with Program Assessment Committee (PAC), Revise action plan of last A.Y. at faculty/department level.

B) PO attainment and Continuous Improvement (PC and HoD Level)

Category	Outcome	Action by PC and HoD
Course related	PO attained highly	Include activities with HOT.
	PO not attained highly	Identify concerned courses, plan for immediate improvements, guide, support and monitor its execution.
Activity related	Activities Conducted	Critical assessment, impact analysis to be done and revise as per the need for improvements.

Conclusion:

In conclusion, this Outcome-Based Education (OBE) manual serves as a comprehensive guide for the stakeholders of Nirmala College of Pharmacy committed to fostering a dynamic and effective learning environment. Throughout this manual, we have delved into the principles, strategies, and implementation techniques essential for aligning education with measurable outcomes.

OBE, with its emphasis on clearly defined learning outcomes, has proven to be a transformative approach in the educational landscape. By shifting the focus from mere content delivery to demonstrable student achievement, OBE empowers educators to create meaningful and engaging learning experiences. The emphasis on measurable outcomes not only enhances the quality of education but also ensures that learners are equipped with the skills and knowledge needed for success in the real world.

As highlighted in this manual, the key components of OBE include the development of clear learning objectives, the design of relevant assessments, and the continuous feedback loop for improvement. By adopting these principles, educators can create a structured and purposeful educational experience that prepares students for the challenges of the 21st century.

The success of OBE is not only evident in improved student performance but also in the development of critical thinking, problem-solving, and communication skills. As educational institutions worldwide face evolving challenges, OBE stands as a resilient and adaptable framework that can be tailored to meet the diverse needs of learners.

In closing, this OBE manual is a valuable resource for educators seeking to embrace a student-centered approach that prioritizes learning outcomes. By incorporating the principles outlined in this manual, educators can contribute to the creation of a more effective, relevant, and impactful educational system that empowers students to thrive in an ever-changing world. As we embark on this journey toward outcome-based education, let us remain dedicated to the pursuit of excellence, innovation, and continuous improvement in the service of our students and the broader educational community