Janta Shikshan Prasarak Mandal's

Marutraoji Ghule Patil Art's, Commerce and Science College, Ahmednagar

(Affiliated to Savitribai Phule Pune University, Pune)

Program Outcomes(PO), Program Specific Outcomes(PSO) and Course Outcomes(CO)

Assessment and Attainment Manual

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CONTENT

PREFACE

This manual is a reference to help faculty, staff and stakeholders to understand OBE is an Outcome Base Education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). Each student should have achieved the goal by the end of the educational experience. the Outcome Based Education (OBE) system implemented at Marutraoji Ghule Patil Art's, Commerce and Science (MGPC).

The manual serves as valuable guidelines for the faculty to develop an assessment plan in the process to measure the outcome of the students during their course of study and also after their graduation. The manual outlines the process involved in developing a constructive curriculum development and content delivery or teaching plan.

DEFINITIONS

Graduates Attributes (GAs) are the components indicative of the graduate‟s potential to acquire competence to practice at the appropriate level. GAs form a set of individually assessable outcomes of the programme.

Programme Educational Objectives (PEOs) describe the career and professional developments of graduates, which are to be assessed after 2 or 3 years of graduation.

Programme Outcomes (POs) explain the Knowledge, Skills and Attitude that the students are expected to attain upon graduation.

Course Outcomes (COs) outline the course specifications to be acquired by students.

Knowledge, Skills and Attitude (KSA) are the three types of behavior elements, also known as educational activities that are selected from Bloom‟s taxonomy.

Course Syllabus (CS) provides a comprehensive description of a curriculum offered by the respective programme of study from Board of Studies.

Faculty Record Book (FRB) is a teaching-learning plan developed by the Course Coordinator for a semester.

Comprehensive Examination Analysis (CEA) is an in-house developed tool to measure the achievement of COs and POs.

Course End Survey Analysis (CESA) (Indirect method) is a technique to measure the attainment of COs and POs indirectly from the components of course outcomes.

Course End Analysis (CEA) (Direct method) is a technique to measure the attainment of COs and POs directly from levels of internal components.

Institute Vision & Mission

Vision:

"Empower and upliftment of students of socially, educationally and economically weaker section of society through quality education."

Mission:

- To make competent students with scientific attitude, sensible and noble democratic minded and responsible citizens of India.
- To provide quality education with arts, culture, sports and scientific innovation.
- To create awareness among students to preserve our environment, culture and national heritage.
- To foster holistic personality of the students with special focus on girls.
- To promote research culture among the faculty and students for the benefits of the society.

OUTCOME BASED EDUCATION (OBE)

3.1 OBE DEFINITION

Outcome-Based Education (OBE) is an academic process and approach focuses in developing expected outcomes (i.e. Knowledge, Skills and Attitude) for the students to achieve during graduation.

3.2 OBE IMPLEMENTATION

Implementing OBE is important process in order:

- To ensure a well-structured education system (i.e. PEOs, POs, COs, Course plan, CS, FRB, CEA and CESA) is achieved.
- To support accreditation process from NAAC.

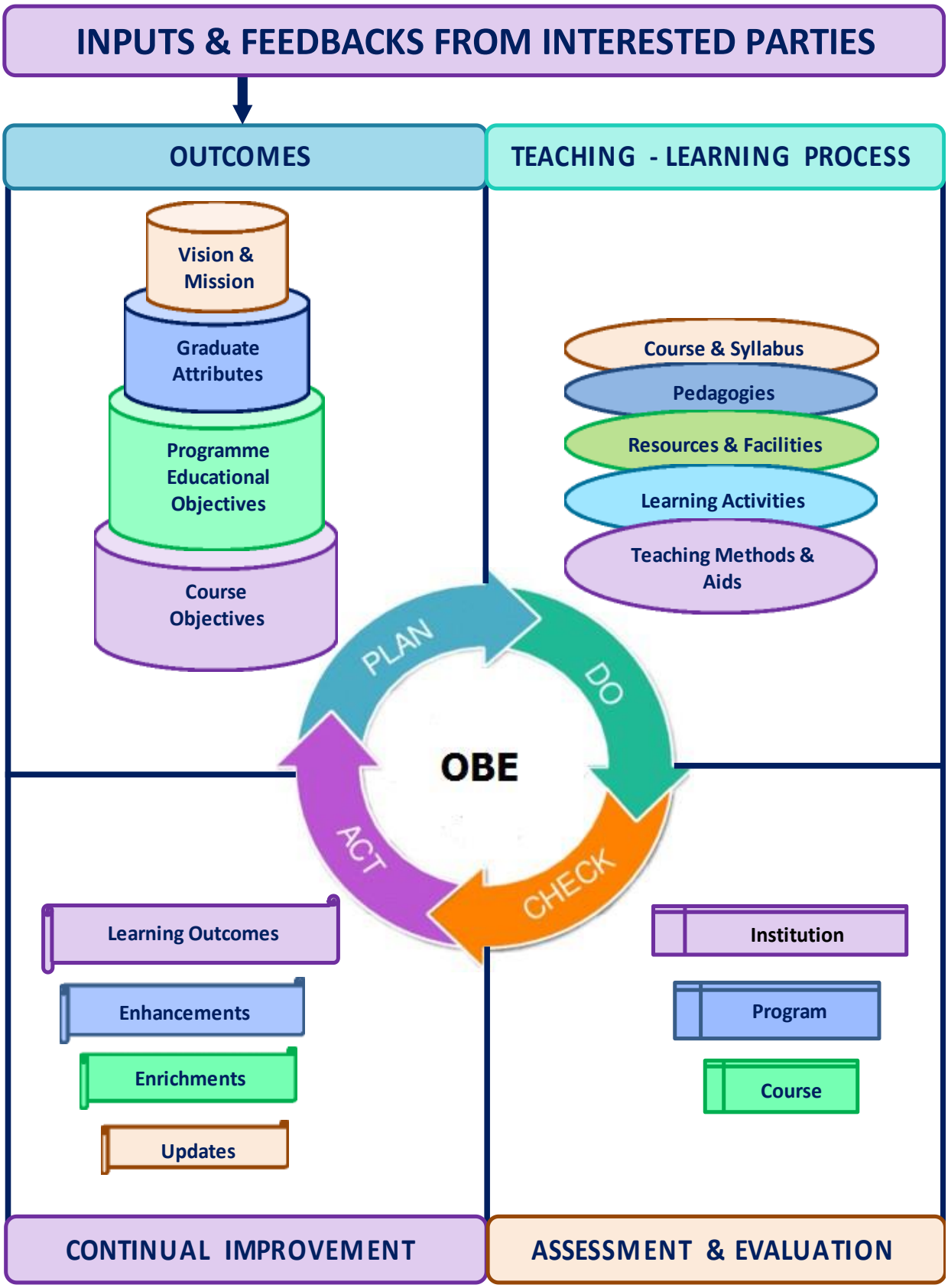
3.3 OBE IMPLEMENTED

The OBE was initially implemented from 2016 onwards, the implementation of OBE is based on teaching-learning approaches (i.e. delivery and assessment) in compliance with the FRB book. The curriculum must be designed using the constructive alignment approach.

3.4 OBE INVOLVEMENT

All faculty members (i.e. academic, technical and supporting staff) are involved in the OBE implementation.

Concerned Programme Coordinator is responsible to monitor the implementation of OBE in the teaching-learning and evaluation activities by the faculty member.


INPUTS & FEEDBACKS FROM INTERESTED PARTIES
OUTCOMES
TEACHING - LEARNING PROCESS
Vision & Mission
Graduate Attributes
Programme Educational Objectives
Course Objectives
Course & Syllabus
Pedagogies
Resources & Facilities
Learning Activities
Teaching Methods & Aids
PLAN
DO
CHECK
ACT
OBE
Learning Outcomes
Enhancements
Enrichments
Updates
Institution
Program
Course
CONTINUAL IMPROVEMENT
ASSESSMENT & EVALUATION

Graduate Attributes

The graduate attributes reflect the particular quality and feature or characteristics of an individual, including the knowledge, skills, attitudes and values that are expected to be acquired by a graduate through studies at the higher education institution (HEI) such as a college or university. The graduate attributes include capabilities that help strengthen one's abilities for widening current knowledge base and skills, gaining new knowledge and skills, undertaking future studies, performing well in a chosen career and playing a constructive role as a responsible citizen in the society. The graduate attributes define the characteristics of a student's university degree programme(s), and describe a set of characteristics/competencies that are transferable beyond study of a particular subject area and programme contexts in which they have been developed. Graduate attributes are fostered through meaningful learning experiences made available through the curriculum, the total college/university experiences and a process of critical and reflective thinking. The learning outcomes-based curriculum framework is based on the premise that every student and graduate is unique. Each student or graduate has his/her own characteristics in terms of previous learning levels and experiences, life experiences, learning styles and approaches to future career-related actions. The quality, depth and breadth of the learning experiences made available to the students while at the higher education institutions help develop their characteristic attributes. The graduate attributes reflect both disciplinary knowledge and understanding, generic skills, including global competencies ,that all students in different academic fields of study should acquire/attain and demonstrate. Some of the characteristic attributes that a graduate should demonstrate areas follows:

1. **Disciplinary knowledge:** Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

2. Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

3. Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

4. Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

5. Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyse and synthesise data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.

6. Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.

7. **Cooperation/Team work**: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

8. Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

9. Reflective thinking: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.

10. Information/digital literacy: Capability to use ICT in a variety of learning situations,demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

11. Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

12. Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.

13. Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

14. Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

15. Lifelong learning: Ability to acquire knowledge and skills, including learning how to learn", that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskillin

Undergraduate Degree Program Outcomes (PO),Programme Specific Outcome(PSO'S) and Course Outcome(C.O.)

As per the LOCF of UGC Savitribai Phule Pune University's Board of Studies Developed the Syllabus for the affiliated colleges and the particular Programme rum in our Affiliate college .Program is defined as range of learning experiences offered to students in formal manner over a period of one to four years leading to certificates/diplomas/degrees. E.g. B. A. ,B.Com., B. Sc and B. Sc. Computer Undergraduate Degree Programmes Programme outcome (P.O.) and Programme Specific Outcome (PSO'S) with the Course wise Course Outcome(C.O) are mention in Marutraoji Ghule Patil P.O,PSO'S and C.O. Manual 2021-22 created by IQAC department.

PROGRAMME OUTCOME OF ALL PROGRAMME GIVEN BELOW

Statements of Programme Outcome

Program outcomes: Describe what students are expected to know and would be able to do by the time of graduation. These relate to the skills, knowledge, and behaviours that students acquire as they progress through the program.

UNDERGRADUATE PROGRAMMES – B.A/ B.Com/ B.Sc

PO1 **Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2 **Problem Solving**: Identify, formulate, conduct investigations, and find solutions to problems based on in-depth knowledge of relevant domains.

PO3 **Communication**: Speak, read, write and listen clearly in person and through electronic media in English/language of the discipline, and make meaning of the world by connecting people, ideas, books, media and technology.

PO4 **Responsible Citizenship**: Demonstrate empathetic social concern, and the ability to act with an informed awareness of issues.

PO5 **Environment and Sustainability:** Understand the impact of technology and business practices in societal and environmental contexts, and sustainable development

PO6 **Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO7 **Computational Thinking:** Understand data-based reasoning through translation of data into abstract concepts using computing technology-based tools

Faculty of Arts

Program Specific Outcome of English	
PSO1	Reading
PSO2	Nation and Tradition
PSO3	Critical Insight in Literary Texts
PSO4	Issues and awareness of Sexuality and Gender: Arts
PSO5	Realizing Moral Values
PSO6	Writing skills.
PSO7	Learning Effective Communication
Objectives:	
PO1	To expose students to the best examples of prose and poetry in English so that they realize the beauty and communicative power of English
PO2	To instill human values and develop the character of students as responsible citizens of the World
PO3	To develop the ability to appreciate ideas and think critically
PO4	To enhance employability of the students by developing their linguistic competence and communicative skills
PSO5	To revise and reinforce structures already learnt in the previous stages of learning.
B.A. Economics	
Program Specific Outcomes	
The principal aims of objective of the BA Economics programme are To provide students a well-founded education in Economics	
PSO1	To provide structured curricular which support the academic development of students
PSO2	To provide and adapt curricular that prepare our graduated for employment and further study as economists.
PSO3	To provide students with the opportunity to pursue courses that emphasizes quantitative and theoretical aspects of Economics.
PSO4	To provide students with the opportunity to focus on applied and policy issues in Economics
PSO5	To provide students programmers that allows the students to choose from a wide range of economics specialization.
PSO6	To provide a well –resourced learning environment for Economics.
	Department of Marathi **Program Outcome of Bachelor of Arts (B.A.)** Students seeking admission for B.A. programme are expected to imbue with following quality which help them in their future life to achieve the expected goals. PO-1. Realization of human values. PO-2. Sense of social service. PO-3. Responsible and dutiful citizen. PO-4. Critical temper. PO-5. Creative ability. **Programmes Specific Outcomes B.A. (MARATHI)** PSO-1. Creating an interest in literature. PSO-2. Availing the job opportunities in transformation and media. PSO-3. Developing language. PSO-4. Increasing the critical attitude about literary studies. PSO-5. Imbuing the literary research attitude. **Department of Hindi** **Program Outcome of Bachelor of Arts (B.A.)**

	Students seeking admission for B.A. programme are expected to imbue with following quality which help them in their future life to achieve the expected goals. PO-1: Realization of human values. PO-2: Sense of social service. PO-3: Responsible and dutiful citizen. PO-4: Critical temper. PO-5: Creative ability. 10 **Programmes Specific Outcomes B.A. (Hindi)** PSO-1: Creating an interest in literature. PSO-2: Availing the job opportunities in transformation and media. PSO-3: Developing language. PSO-4: Increasing the critical attitude about literary studies. PSO-5: Imbuing the literary research attitude.

Programme Bachelor of Commerce

Bachelor of Commerce B.Com	
After successfully Completing B.Com programme, students will able to	
PO1	In depth knowledge, understanding and skills in commerce.
PO2	Build a strong foundation of knowledge in different areas of Commerce.
PO3	Develop the skill of applying concepts and techniques used in Commerce for real life problems.
PO4	Inculcate reading, writing, speaking skills and Business correspondence.
PO5	Creates awareness among society about Law and Legislations related to commerce and business.
PO6	Use effectively recent Trends in Business, Organizations and Industries.
PO7	Communicate effectively about Economic Environment of Country as well as World
PO8	Use effectively practical skills in real life related to banking and corporate world.
PO9	Provides a platform for overall development and develop knowledge level and awareness about Recent Trends of World
PO10	Use new technologies effectively to communicate ideas in the area of commerce.
PO11	Critically evaluate new research findings, ideas, methodologies and theoretical frame work in specialized study.
PO12	Work collaboratively and productively in groups.
PSO1	Students will be able to apply basic skills learnt in commerce necessary for analysis of various problems in accounting, marketing, business economics, management and finance.
PSO2	Students will demonstrate progressive affective domain development of values, the role of accounting in society and business.
PSO3	Students will able to demonstrate quantitative and qualitative knowledge in key areas of organization behavior.
PSO4	: Students will able to evaluate national and international issue and discussion on economic, commercial and business related topics

Department of Chemistry

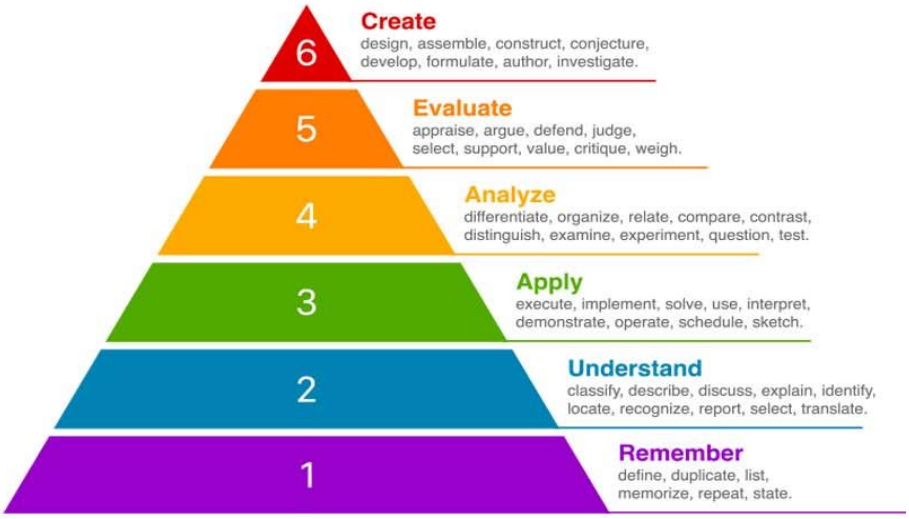
Programme : B.Sc. (Bachelor of Science)

Knowledge outcome	
PO1	Transfer and apply the acquired fundamental knowledge of chemistry, including basic concepts and principles of 1) Physical, Analytical Chemistry, organic chemistry, Inorganic chemistry and biochemistry; (2) analytic techniques and experimental methods for chemistry to study different branches of chemistry;
PO2	Demonstrate the ability to explain the importance of the Periodic Table of the Elementsand represent key aspects of it and its role in organizing chemical information.
Skills Outcomes	
PO1	Apply and demonstrate knowledge of essential facts, concepts, laws, principles andtheories related to chemistry.
PO2	Demonstrate the learned laboratory skills, enabling them to perform qualitative andquantitative analysis of given samples and able to make conclusions on it.
PO3	Set procedure and synthesize simple compounds like soap of commercial importance.
PO4	Engage in oral and written scientific communication, and will prove that they can think and work independently.
PO5	Respond effectively to unfamiliar problems in scientific contexts
PO6	Plan, execute of design experiment, make documentation of it, interpret data at entrylevel of chemical industry and report the results.

After successfully completing **B.Sc. Chemistry** Programme students will be able to:

Programme : B.Sc. (Bachelor of Science)	
PSO1	Understand the nature and basic concepts of Physical, Organic and Inorganic Chemistry
PSO2	Analyze Organic and inorganic compounds qualitatively and quantitatively;
PSO3	Understand the applications of physical, organic, inorganic and analytical chemistry in pharmaceutical, agriculture and chemical industries.
PSO4	Able to perform experimental procedures as per laboratory manual in the area of physical, Inorganic and organic chemistry;
PSO5	Interpretation and synthesis of chemical information and data obtained from chemical and instrumental analysis
	B.Sc. (Computer Science)
	Programme Outcome • Develop ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution. • To prepare students to undertake careers involving problem solving using computer science and technologies. • Develop ability to pursue advanced studies and research in computer science. To produce entrepreneurs who can innovate and develop software product

BLOOM'S TAXONOMY



Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analysing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes. often used when designing educational, training, and learning processes.

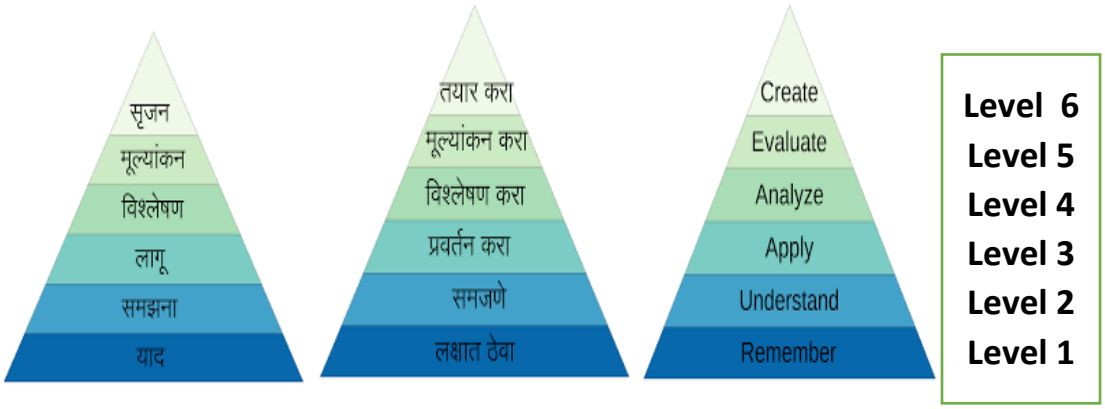


Figure -Pictorial representation of Blooms Taxonomy

Level 1, Remembering

is the most basic, requiring the least amount of cognitive rigour. This is about students recalling key information, for example, the meaning of a word.

Arrange | Define | Describe | List | Match | Name | Order | Recall | Reproduce

Level 2, Understanding

is to do with students demonstrating an understanding of the facts remembered. At this level, the student who recalls the definition of a word, for example, would also be able to show understanding of the word by using it in the context of different sentences.

Classify | Discuss | Explain | Identify | Report | Summarise

Level 3, Applying

is concerned with how students can take their knowledge and understanding, applying it to different situations. This usually involves students answering questions or solving problems**.**

Apply | Calculate | Demonstrate | Interpret | Show | Solve | Suggest

Level 4, Analysing

is about students being able to draw connections between ideas, thinking critically, to break down information into the sum of its parts.

Analyse | Appraise | Compare | Contrast | Distinguish | Explore | Infer | Investigate

Level 5, Evaluating

is reached when students can make accurate assessments or judgements about different concepts. Students can make inferences, find effective solutions to problems and justify conclusions, while drawing on their knowledge and understanding.

Argue | Assess | Critique | Defend | Evaluate | Judge | Justify

Level 6, Creating

is the ultimate aim of students' learning journey. At this final level of Bloom's taxonomy, students demonstrate what they have learnt by creating something new, either tangible or conceptual. This might include, for example, writing a report, creating a computer program, or revising a process to improve its results.

Compose | Construct | Create | Devise | Generate | Organise | Plan | Produce

The Cognitive Process Dimensions-Categories

As per the blooms taxonomy level there are two major part of thinking

1.**Lower Order Thinking(LOT)**

2. Higher Order Thinking(HOT)

The six level of blooms taxonomy are divided in thinking order are explain in the following chart.

The Cognitive Process Dimensions-Categories					
Lower Order Thinking (LOT)			**Higher Order Thinking (HOT)**		
Remember	**Understand**	**Apply**	**Analyse**	**Evaluate**	**Create**
Recognizing (identifying) Recalling (retrieving)	Interpreting Illustrating Classifying Summarizing Inferring (concluding) Comparing	Executing Implementing	Differentiating Organizing Attributing	Checking (coordinating, detecting, testing, monitoring) Critiquing (judging)	Planning Generating Producing (constructing)

Explaining

Action Verbs for Course Outcomes

Lower Order Thinking(LOT)			Higher Order Thinking (HOT)		
Remember	**Understand**	**Apply**	**Analyse**	**Evaluate**	**Create**
Define	Explain	Solve	Analyse	Reframe	Design
Describe	Describe	Apply	Compare	Criticize	Create
List	Interpret	Illustrate	Classify	Judge	Plan
State	Summarise	Calculate	Distinguish	Recommend	Formulate
Match	Compare	Sketch	Explain	Grade	Invent
Tabulate	Discuss	Prepare	Differentiate	Measure	Develop
Record	Estimate	Chart	Appraise	Test	Organize
Label	Express	Choose	Conclude	Evaluate	Produce

Attainment of Course outcomes

The major components of Learning outcomes are Course Outcome(CO) and Program Outcome(PO). Based on how well these two parts are defined and evaluated, attainment CO is measured.

COs are the statements of knowledge/ skills/ abilities that students are expected to know, understand and perform as a result from their learning experiences in each course.A well written CO facilitates lecturers in measuring the achievement of the CO at the end of the semester. It also helps the teachers in designing suitable delivery and assessment methods to achieve the designed CO.

CO can be defined and verified by using SMART principle as given below.

Specific	They must provide description of precise behaviour and situation it will be performed. And must be concrete, focused and detailed
Measurable	The performance of the objective must be observed and measured
Achievable	The objective must be achieved by using reasonable amount of effort
Realistic	They must be appropriate for the student and the situation
Time-bound	Must be clearly stated with a time limit for accomplishing objective

Calculating Course Outcome(CO)

Calculating Course Outcomes (CO) involves calculations from the marks obtained by the students in their internal exams, university exams and internal assessment metrices such as quiz, seminar, presentation, mini project, assignment etc., The indirect method represents a part of Program Outcome is purely survey oriented, so the calculations are based on data and surveys collected from the Current passing out students, Stakeholders, Alumni, Survey from placement officers etc.,

Things to be considered for Calculating CO attainment

- Every internal assessment metrices must be mapped to their corresponding CO's

Test	CO1
Quiz	CO2
Presentation	CO3
Seminar	CO4
Group Mini Project	CO5

- While defining question paper for exams, questions must be chosen based on their corresponding CO's weightage and must be mapped to their CO's. This helps us to calculate the performance of a student for a CO

Calculating CO level for internal examinations

- As discussed above, the internal exam questions must be mapped to their CO's, this help us to list the marks obtained by students for CO in the below image.
- RUBRICS helps us to define the threshold through which level of attainment of a CO's are calculated.
- Rubrics are a simple way to set up some grading criteria through which level of attainment is calculated by using some predefined values.
- Rubrics example used in sample calculation is given below
- The Threshold value is the Minimum pass percentage for each CO in a subject

RUBRICS

50% OF STUDENT ABOVE 50%	1 (LOW)
60% OF STUDENT ABOVE 50%	2 (MEDIUM)
70% OF STUDENT ABOVE 50%	3 (HIGH)

Step 1: Calculating CO level for internal exams

- The marks obtained the students for each CO in an exam (internals) are listed out as shown in the below figure based on the weightage allocated (max mark CO wise) for the CO's in the exam. Level of CO attainment is based on the percentage of students above the threshold percentage.
- For example: In the table below to calculate the level of CO1 for Test 1, the marks scored by 4 students are listed CO-wise and their max mark is specified. Since 50 is the pass percentage threshold and rubrics are set for 50%, by calculating number of students above threshold (only 2 out of 4 which is 50%) the level is defined as 1(low) as specified in the rubrics

Students	Test 1(marks obtained out of 50)		Test 2 (Marks obtained out of50)	
	CO1	CO2	CO1	CO
Student 1	30	20	25	35
Student 2	26	10	25	35
Max marks	50	50	50	50
Threshold level(50%)	25	25	25	25
No of students above	2	0	0	2
Level	3	1	1	3 level

RUBRICS

50% OF STUDENT ABOVE 50%	1 (LOW)
60% OF STUDENT ABOVE 50%	2 (MEDIUM)
70% OF STUDENT ABOVE 50%	3 (HIGH)

Step 2: Calculating Final CO attainment for the subject

Based on the level of CO obtained for internal and external from the above method the final CO attainment is calculated. The level of CO of each test are listed in the below format.

Such calculations can be done for each course

Internal exams and assessments			
Course	TEST1	TEST2	Average of internal assessment
CO1	3	1	2
CO2	1	3	2
INTERNAL ATTAINMENT: 2(average of total)			
Final attainment is out of 3 for the course is 2 i.e. 60%			

Attainment of Program outcomes

Programme Outcomes (PO) are the knowledge, skills, and abilities students should possess upon graduation, they are the central organising feature of student learning. Program Outcomes (PO) can only be achieved and demonstrated through the integration of course components and Course Outcomes (CO).

Characteristics of Program Outcome (PO)

To effectively define your PO statement check them whether they satisfy following characters

- Must define the scope and depth of the program
- Should focus on the end-point of the program
- Identify what typically students will know and be able to do on graduation
- Should be measurable, realistic and achievable within the context and timeframe
- Must be realised through component courses over the extent of the program
- They should be demonstrated through course assessment, particularly in final year courses, and especially through capstones.

Process involved in CO-PO mapping

Step 1: Obtain Course Outcome.
Step 2: Mapping of Course Outcome with Program Outcome by the course coordinator
Step 3: The faculty advisor and head of the department review the CO statement and CO-PO mapping
Step 4: The documentation for the CO attainment target level prepared by course coordinator
Step 5: Setting weightage for CO assessment by course coordinator for internal exam question paper, assignment and seminar.
Step 6: CO measurement through assessment by course coordinator
Step 7: Obtain CO attainment table through direct assessment methods.
Step 8: Obtain PO attainment table through direct assessment methods.
Step-9: Submit CO PO attainment report to Faculty advisor.
Step-10: The faculty advisor submit the CO-PO attainment along with curriculum gap identified in the course and recommendations for the actions to be taken to Head of the department.
Step-11- H.O.D would consolidate the CO and PO attainment of the

programme with all the identified gaps and submit report to IQAC.

Step-11- IQAC will list out the steps to be taken to bridge the curricular gap. Contend beyond the syllabus may be delivered to the students through teaching, arranging guest lectures, providing online videos courses, external training, online quiz etc.

As per OBE, two methods are used for calculating and obtaining Program Outcomes and they are

- Direct method.
- Indirect method.

For measure PO in direct method a CO/PO matrix is used to measure PO. The CO are linked to the PO using the CO vs PO matrix as stated in Course Syllabus blueprint. When designing the CO, lecturers of each course map their CO to the appropriate PO to ensure that all PO are delivered throughout the study.

Defining CO weightage for a PO in CO/PO matrix, the weightage scale can be of any format (1-10, 1-100) but by using the scale 1-3 helps us to simplify our calculations

Where 1 represents Low
2 represents Medium
3 represents High

The indirect program attainment is calculated by using the formula
Indirect program attainment = Sum of levels of attainment of a PO / **3**

For Example, to calculate indirect program attainment for PO1

PO1 attainment = 3+3+3 / 3

PO1 attainment = 3

Similarly PO attainment is measure for all subjects and the cumulative PO is calculated. The results from PO calculation are further used for Graduate Attribute (GA) respective matrices.

Survey	Indirect PO Attainment														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Current Passing student	3	2	1	1	2	3	1	3	1	2	2	2	2	2	1
Alumni	3	2	2	1	2	2	2	1	2	2	3	2	3	3	1
Placement Officers	3	2	3	2	2	2	1	1	3	2	2	3	2	1	1
Indirect Program Attainment	3.00	2.00	2.00	1.33	2.00	2.33	1.33	1.67	2.00	2.00	2.33	2.33	2.33	2.00	1.00

CO – PO AND CO – PSO MAPPING OF COURSES

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
"-"	indicates there is no correlation.

Levels of Outcomes

There are four levels of outcome such as Course Outcome (CO), Program Outcome (PO), Program Specific Outcome (PSO) and Program Educational Objective (PEO). Course Outcomes are the statements that declare what students should be able to do at the end of a course.

Process involved in CO-PO Mapping

The role of CO-PO mapping will be assigned to the faculty as per hierarchy followed the course (subject) allotment from the department, the course in-charge of the course has to write appropriate COs for their corresponding course. It should be narrower and measurable statements. By using the action verbs of learning levels, CO's will be designed. CO statements should describe what the students are expected to know and able to do at the end of each course, which are related to the skills, knowledge and behaviour that students will acquire through the course.

After writing the CO statements, CO will be mapped with PO of the department. If the department is having more than one section in a year or the same course is available for more than one program of the same institute in a semester, the subject expert will be nominated as course coordinator of the corresponding course. The role of the course coordinator is to review the CO statements and the CO-PO mapping which has been done by department.

Process used to identify the curricular gaps to the attainment of COs/POs

The process used to identify the curricular gaps to the attainment of COs/POs is given as below:

Step-1: The course handling faculty, after CO-PO mapping, would submit CO attainment to Course coordinator.

Step-2: The course coordinator would submit the CO-PO attainment along with curriculum gap identified in the course and recommendations to conduct co-curricular activities & identify content beyond the syllabus to Year wise coordinator.

Step-3: The year wise coordinators who are the members of the Department Assessment Audit Committee would consolidate the CO attainment of the respective year along with curricular gaps and recommendations to conduct co-curricular activities reported by course coordinators.

Step-4: The Department Assessment Audit Committee would consolidate the CO and PO attainment of the programme with all the identified gaps and submit report to DAC.

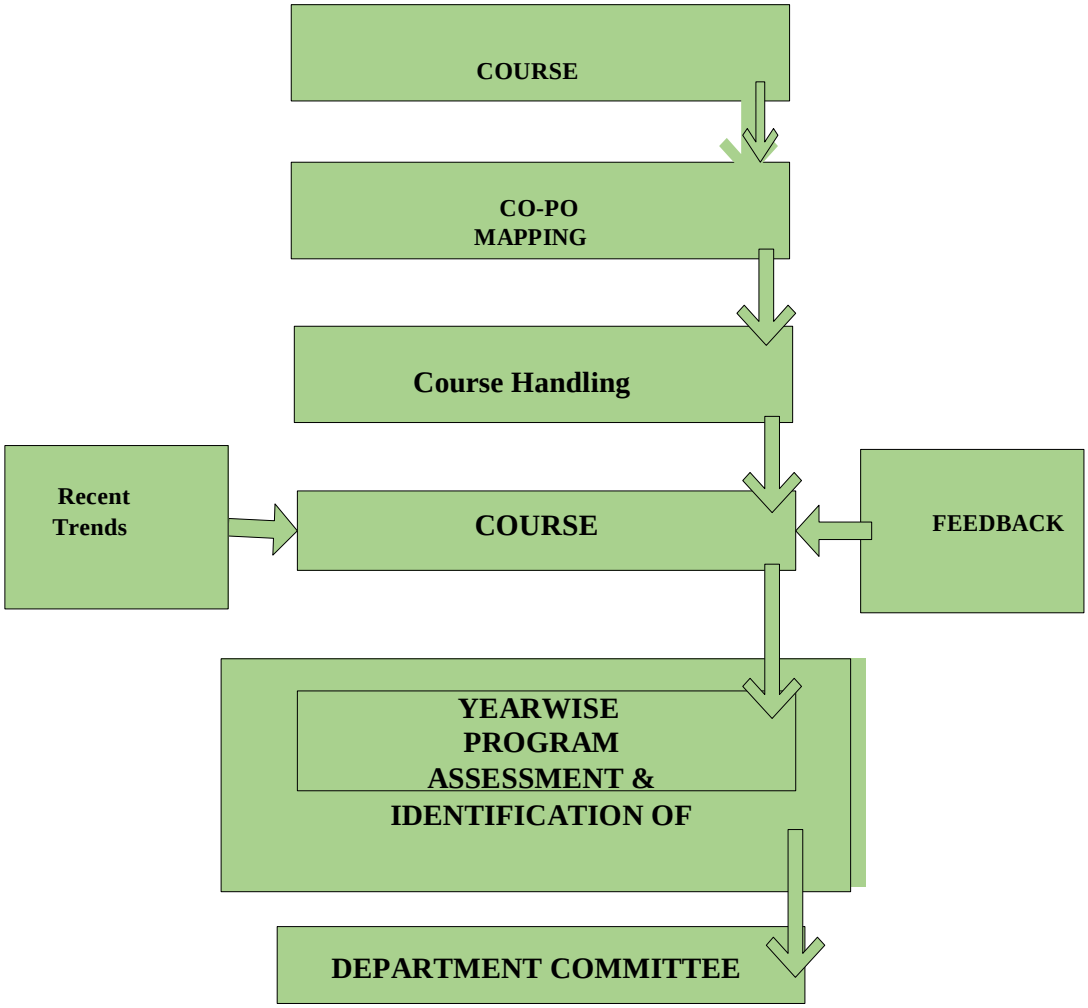


Figure : Identification of curricular gap

Department Assessment Audit Committee after getting prior approval from Department Academic Committee about the steps to be taken to bridge the curricular Gap and content beyond the syllabus may be delivered to the students through teaching, arranging guest lectures, industrial visit, in plant training, online quiz, etc.

Format For Mapping

		Format of Course outcome Attainment
		janata shikshan Prasarak Mandals **Marutraoji Ghule Patil Arts, Commerce and Science college Ahemdnagar**

Name of course	course code	**Academic year 20…….**	Name of Teacher

Course outcome Attainment

course outcome	**P.O. 1**	**P.O. 2**	**P.O. 3**	**P.O.4**	**P.O. 4**	**P.O. 5**	**P.O. 6**	**P.O. 7**	**P.O. 8**	**P.S.O 1**	**P.S.O 2**	**P.S.O 3**	**P.S.O 4**
C.O.1													
C.O.2													
C.O.3													
C.O.4													
C.O.5													
C.O.6													
C.O.7													
Avg.													

Sign of Course Co-Ordinator Head of Dept. Principal

Format of Course outcome Attainment

janata shikshan Prasarak Mandals

Marutraoji Ghule Patil Arts, Commerce and Science college Ahemdnagar

Name of course	**Academic year 20…….**	course code	Name of Teacher

Course outcome Attainment

Roll no	Name of student	**Concurrent assessment As Per C.O.**						**University Evaluation**		**Total marks**	**Level**
		Test	**Quiz**	**Assignment/ tutorial**	**Seminar**	**Oral**	**Practical**	**Internal**	**Final**		
Total in Average											

Format of Course Wise Programme outcome Mapping

janata shikshan Prasarak Mandals

Marutraoji Ghule Patil Arts, Commerce and Science college Ahemdnagar

	Name of Programme	**Academic year 20…….**

Course wise P.O. Mapping Chart

YEAR	Course Code	**P.O .1**	**P . O .2**	**P.O. 3**	**P.O. 4**	**P.O. 5**	**P.O 6**	**P.O. 7**	**P.O. 8**	**P.O. 9**	**P.S. O 1**	**P.S. O 2**	**P.S.O 3**	**P.S. O 4**
Frist year	XXX													
	XXX													
	XXX													
Second year	XXX													
	XXX													
	XXX													
Third Year	XXX													
	XXX													
	XXX													
	XXX													
	Avg.													

Faculty Incharge IQAC Dept. Principal

Janata shikshan Prasarak mandal's
MARUTRAOJI GHULE PATIL ARTS'S,COMMERCE AND SCIENCE COLLEGE,AMHEDNAGAR.

Department of ……

Academic Year 20… - 20 …

Course Exit Survey

Dear students,
We would be grateful if you could fill out and submit the following Exit Survey.We assure you that your feedback will be treated confidentially for our continuous improvement.

Name of the Student: _____Branch (faculty)----------

Mobile No.: _____ Subject /Course Name : _____

Questionnaire	Excellent (5)	Very Good (4)	Good (3)	Satisfactory (2)	Poor (1)
Teaching Learning					
Teaching & learning methods adopted were					
Overall quality of teaching and learning activities in the college is					
The learning materials and resources provided were					
Facilities / Activities					
Infrastructure and lab facility / Library					
Student's counseling and guidance					
Internet / Wi-Fi facility					
Extracurricular activities and sports					
Safety & Security					
Curriculum					
The curriculum of the program is well designed and promotes learning experience of the students.					
Employability is given focus in the curriculum design					
The curriculum incorporates recent technological developments in the area.					
Career Guidance / Employability					
The guidance received for employment / higher studies / entrepreneurship was					

For your branch, please let us know what level of learning outcomes you have attained, through your degree program.

Course Outcomes (C.O's)	Level of Learning Outcome				
	Excellent (5)	Very Good (4)	Good (3)	Satisfactory (2)	Poor (1)
CO 1:					
CO 2:					
CO 3:					
CO5 :					
CO 6:					

Date: **Signature:**

Janata shikshan Prasarak mandal's
MARUTRAOJI GHULE PATIL ARTS'S,COMMERCE AND SCIENCE COLLEGE,AMHEDNAGAR.

Department of ……

Academic Year 20… - 20 …

Programme Exit Survey

Dear students,
We would be grateful if you could fill out and submit the following Exit Survey.We assure you that your feedback will be treated confidentially for our continuous improvement.

Name of the Student: _____Branch (faculty)----------

Mobile No.: _____ **E-mail Id:** _____

Questionnaire	Excellent (5)	Very Good (4)	Good (3)	Satisfactory (2)	Poor (1)
Teaching Learning					
Teaching & learning methods adopted were					
Overall quality of teaching and learning activities in the college is					
The learning materials and resources provided were					
Facilities / Activities					
Infrastructure and lab facility / Library					
Student's counseling and guidance					
Internet / Wi-Fi facility					
Extracurricular activities and sports					
Safety & Security					
Curriculum					
The curriculum of the program is well designed and promotes learning experience of the students.					
Employability is given focus in the curriculum design					
The curriculum incorporates recent technological developments in the area.					
Career Guidance / Employability					
The guidance received for employment / higher studies / entrepreneurship was					

For your branch, please let us know what level of learning outcomes you have attained, through your degree program.

Program Specific Outcomes (PSOs)	Level of Learning Outcome				
	Excellent (5)	Very Good (4)	Good (3)	Satisfactory (2)	Poor (1)
PO 1:					
PO 2:					
PO 3:					
PO5 :					
PO 6:					

Date: **Signature:**