

# OUTCOME BASED EDUCATION(OBE) MANUAL

## INDEX

S. No.	Topic
1	Vision, Mission Objectives and Quality Policy of the University
2	Outcome Based Education (OBE) Overview
3	OBE Framework
	a. Establishing PEOs using Vision, Mission Statements
	b. POs, PSOs and COs
	c. Design of Curriculum
	d. CO-PO Mapping
	e. CO-PO Attainment
4	Measures for Continuous Improvement

## **Abstract**

Outcome based education (OBE) is a student-centric educational model that maps and measures students' performance at every step. The OBE model aims to maximize student learning outcomes by developing their knowledge and skills. The outcome based education system, also referred to as standard based education, and has proven to be a success in helping institutions measure their learning outcomes and at the same time enabling students to develop new skills that prepare them to stand out with their global counterparts. This document gives an overview of the OBE then followed by the ways of achieving the outcome based education. The process of defining the PEO based on vision and mission of university and then defining the course outcomes. The COs are mapped to POs and procedure used to attaining the CO with PO and finally the ways to improve the attainment.

## **1. Vision, Mission, Objectives and Quality Policy**

### **Vision of University**

The Shobhit University will be internationally recognized as a premier Indian University with a global perspective that educates leaders who will fashion a more humane and just world.

### **Mission of University**

The core mission of the University is to promote learning in Indian tradition with international outlook. The University offers undergraduate, graduate, research scholars and professional students, the knowledge and skills needed to succeed as persons and professional in niche technical areas, and the values and sensitivity necessary to be men and women for others.

The University will distinguish itself as a diverse, socially responsible learning community of high quality scholarship and academic rigor, sustained by Indian ethics & values. The University will draw from the cultural, intellectual and economic resources of the nation to enrich and strengthen its educational programmes.

### **Objectives**

- Developing a sense of ethics in the University and community, making it conscious of its obligations to society and the nation
- Performing all the functions of interest to its major constituents like faculty, staff, students, and the society to reach a leadership position

- Smooth transition from teacher-centric focus to learner-centric processes and activities
- To offer high-quality education in a competitive manner
- Creation, preservation and dissemination of knowledge and attainment of excellence in different disciplines

## **Quality Policy**

Aspire to provide education with excellence that will enable us advance to the frontiers of knowledge encompassing teaching, research, consultancy, and progressive education; while inculcating moral, ethical and social values to build a quality culture amongst all the stakeholders.

## **2. Outcome-Based Education (OBE)**

Outcome-Based Education (OBE) is an approach to education that focuses on the desired outcomes or results of the learning process, rather than just the delivery of content or the completion of courses. OBE process is a result-oriented approach to education that aims to produce students who are not only knowledgeable in their field of study but who are also able to apply that knowledge to real-world situations. It is a student-centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills, and attitudes. It focuses on the evaluation of outcomes of the program by stating the knowledge, skill, and behavior a graduate is expected to attain upon completion of a program after graduation. In the OBE model, the required knowledge and skill sets for a particular degree are predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

The key features for the implementation of Outcome-based education include –

- Development of a curriculum framework that outlines specific and measurable outcomes.
- Instructional Methodology to ensure delivery for specified outcomes.
- Assessments to determine if students have achieved the stated standard.

## **Title and Application**

These Guidelines called Outcome Based Education Guidelines shall apply to all students, faculty members and administrators.

## Objective

The objective of these Guidelines is to ensure a fair and reliable measure of students' performance, knowledge, and skills against the learning outcomes. These also discipline pedagogy by evaluating the effectiveness of the teaching process that can facilitate continuous improvement and promote subsequent learning through clear, timely, and relevant feedback.

### The benefits of OBE include:

- **Improved student learning outcomes:** The focus on outcomes helps students to see the relevance of what they are learning and to develop the skills and knowledge they need to be successful in their future careers.
- **Increased accountability:** By emphasizing the outcomes that students are expected to achieve, OBE helps to hold educators and institutions accountable for the quality of education they provide.
- **Better alignment with workforce needs:** OBE helps to ensure that students are learning the skills and knowledge that are relevant and in demand in the workforce.
- **More effective assessment:** By focusing on outcomes, OBE allows for a more meaningful and relevant assessment of student learning, which can provide valuable feedback to students and educators.
- **Personalized learning:** OBE emphasizes the individual needs and learning styles of each student, which can lead to more personalized and effective learning experiences.

## Definitions

Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery and assessment are planned to achieve stated objectives and outcomes. It focuses on measuring student performance i.e. outcomes at different levels. Some important aspects of Outcome Based Education -

1. **Course** is defined as a theory, practical, or theory cum practical subject studied in a semester.
2. **Course Outcome (CO)** Course outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Outcomes may be specified for each course based on its weightage.
3. **Program** is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, and co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For e.g.: B.Tech. (CSE), MBA etc.

4. **Program Outcomes (POs)** Program outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.
5. **Program Educational Objectives (PEOs)** of a program are the statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation.
6. **Program Specific Outcomes (PSO)** are what the students should be able to do at the time of graduation with reference to a specific discipline. Usually there are two to four PSOs for a Program.
7. **Graduate Attributes (GA):** The graduate attributes, are exemplars of the attributes expected of a graduate from a Program.

### 3. OBE Framework

#### 3a. Establishing PEOs using Vision, Mission statements

##### **Program Educational Objectives (PEOS)**

The program educational objectives help to develop critical, analytical, innovative, creative and problem-solving abilities among its graduates. The program makes the graduates employable across sectors. With further education and earning of higher level degrees help the graduates to pursue a career in academics or scientific organizations as researchers.

##### **The process for defining the PEOs:**

Thus, PEOs are formulated/reviewed through a consultative process involving the Stakeholders including students, alumni, industry, employers, and faculty and staff members and includes the following steps:

**Step 1:** Program outcomes, Vision and Mission of the University and School are taken the basic guide for consultation with various stakeholders.

**Step 2:** Collate the inputs, prepares the draft/revised PEOs and circulates to all stakeholders for suggestion/inputs.

**Step 3:** BoS deliberates on the views given in step 2 and finalize the PEOs.

**Step 4:** The Director/Program Coordinator presents the PEOs to the Board of Studies (BoS) and submits the final Version the Statutory Bodies for approval.

### 3b. POs, PSOs and COs

#### **Program Outcomes (PO):**

- POs are statements that describe what students are expected to know and be able to do upon graduating from the program.
- These relate to the skills, knowledge, analytical ability attitude and behavior that students acquire through the program.
- These parameters are called Graduates Attributes and they vary from discipline to discipline and level to level.
- The POs essentially indicate what the students can do from subject-wise knowledge acquired by them during the program.

#### **Program Specific Outcomes (PSO):**

- These are what the students should be able to do at the time of graduation.
- The PSOs are program specific. PSOs are written by the department/school offering the program.
- There usually are two to four PSOs for a department/school.
- These are decided by the Vice Chancellor/head of the University with the help of the Director/Program Coordinators and Experts.

#### **Course Outcomes (CO):**

- COs are narrower statements that describe what students are expected to know, and be able to do at the end of each course/subject.
- While the POs define the school program outcomes, the COs are more oriented towards the subjects and are mostly defined by the faculties consulting higher authorities.
- The COs are more like statements that relate to the skills, knowledge, and behaviour the students acquire as they go through a specific course within a program.

- They collectively contribute to the program outcomes. They are to be mapped to the POs, and not necessarily to a single one.
- Two or more COs can be mapped to a PO and a CO can be mapped to one or more PO(s). COs are mapped to different POs based on their influence on them.

### 3c. Design of curriculum

All programs include Program Outcomes (POs), Program Specific Outcomes (PSOs), course objectives, and course outcomes (Cos).

Program Outcomes (POs), Program Specific Outcomes (POs) and Course Outcomes (COs) of all Programs and courses are prepared in alignment with University's vision, mission and the learning requirements of the students.

Course outcomes are mapped with the Program Outcomes and aligned with Bloom's taxonomy learning levels. Course outcomes are aligned with the Course Delivery methods. Course outcomes for each course are finalized through discussions with all the course teachers.

### 3d. CO-PO Mapping

The CO-PO (course outcome-program outcome) mapping process is a crucial aspect of educational program design and assessment. It helps in aligning the course outcomes with the program outcomes and ensures that students can develop the desired skills and competencies as per the program objectives. The process helps in determining the extent to which the program outcomes are being achieved through the courses offered and helps in the continuous improvement of the program.

**To perform the CO mapping with PO and PSO, as illustratively shown in the table.**

CO Mapping with PO and PSO															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	-	-	-	-	-	-	2	2	3	2	2
CO2	2	2	2	2	1	-	1	-	-	-	2	2	3	3	2
CO3	2	2	2	2	2	-	-	-	-	-	2	2	3	2	3
CO4	3	3	3	3	-	1	1	1	1	1	2	2	3	3	2
Average	2.25	2.25	2.25	1.75	0.75	0.25	0.5	0.25	0.25	0.25	2	2	3	2.5	2.25
<b>3-High</b>				<b>2-Medium</b>				<b>1-Low</b>							

*Here in the table, '3' corresponds to a high correlation; '2' corresponds to a medium correlation, and '1' corresponds to a low correlation, between CO and PO/PSO.*

### 3e. CO-PO Attainment

Course Attainment is the sum of Direct Attainment and Indirect Attainment. Direct Attainment is computed based on the marks obtained by students in the respective Assessment Tools and Indirect Attainment is computed from the Course End Survey/Feedback.

**Table 1**

**CO Attainment Calculations**

	Direct attainment								Indirect Assessment	
	Internal						External		Course Exit Survey	
	CIA1		CIA2				ESE			
<b>Number of students who have scored more than the target (P)</b> (Target is 60%)		P		P				P		P
<b>Percentage of students who have achieved the target = <math>(P/N) \times 100</math></b> (N is the number of students who appeared in the exam)		$(P/N) \times 100$		$(P/N) \times 100$				$(P/N) \times 100$		$(P/N) \times 100$
Attainment Level (3 for >80%, 2 for >70%, 1 for > 60%)	a =		b =				c =		d =	
Attainment based on internal assessment (CIA) = Average of (a and b);					CIA	=				
Direct CO Attainment Level (DA) = 40% CIA + 60% End-Term © ;					DA	=				
Indirect CO Attainment Level (IA) ( based on Exit Survey (d));					IA	=				
80 % of DA						=				
20 % IA						=				
CO Attainment Level (COA) = 80 % DA+ 20 % IA;					COA	=				

**Note:** After filling in the details in the last step (P and P/N), assign the attainment level (3/2/1 according to (P/N) values) based on Direct Assessment 1, Direct Assessment 2, and Indirect Assessment.

**Attainment level (3 if more than 80% of students achieved the target/2 for >70%/1 for>60%)**

**Direct assessment 1:** refers to evaluation through internal assessments which majorly include Continuous Internal Assessments (CIA1/CIA2) in terms of Internal Assessment Tests, Lab Assignments, Home Assignments, Class/Assignment Tests, Presentations, quizzes, etc.

**Direct assessment 2:** refers to evaluation through End Semester Examinations (ESE)

**Indirect assessment:** refers to the exit feedback survey/feedback taken by students/faculty/employers. The exit feedback survey must be taken up before the end of the semester. The exit survey may be based on a marking scheme (1-3) for each CO.

### **Further steps to follow for the calculation of Course Outcome attainment (COA) level:**

Please refer to the first column in the table 2 for conventions used (A, B, C, D, and E) for each parameter to calculate COA.

**A:** Assign the attainment level (3 for >80%/2 for >70%/1 for >60%) for Direct Assessment 1, Direct Assessment 2, and Indirect Assessment.

**B:** Attainment based on internal assessment (CIA) = Average of [CIA1 (a) and CIA2 (b)]

**C:** Direct CO Attainment Level (DA) = 40% CIA + 60% End-Term (c)

**D:** Indirect CO Attainment Level (IA)

**E:** Finally, Course Outcome Attainment (COA) level = 80% of DA and 20% of IA

**Table 2**

	CO Attainment Calculations										
		Direct Assessment							Indirect Assessment Students/ Faculty/Employer		
		Direct Assessment 1 (CIA)					Direct Assessment 2 (ESE)				
		CIA1	CIA2				ESE		Course Exit Survey/Feedback		
	Number of students who have scored more than target (P)		19		15				22		22
	Percentage of students who have achieved the target = (P/N)*100		86.4		68.2				100		100
A	Attainment Level (3 for >80%, 2 for >70%, 1 for> 60%)	a =	3	b =	1			c =	3	d =	3
B	Attainment based on internal assessment (CIA) = Average of (a and b);					CIA	=	2			
C	Direct CO Attainment Level (DA) =40% CIA + 60% End-Term (C);					DA	=	2.6	= 0.4*2 + 0.6*3		
D	Indirect CO Attainment Level (IA) (based on Exit Survey (d));					IA	=	3			
	80 % of DA						=	2.08			
	20 % IA						=	0.6			
E	CO Attainment Level (COA) = 80 % DA+ 20 % IA;					COA	=	2.68			

**Based on the Course Objectives Attainment (COA) value as calculated at the end, perform the PO/PSO Attainment Calculations as shown below:**

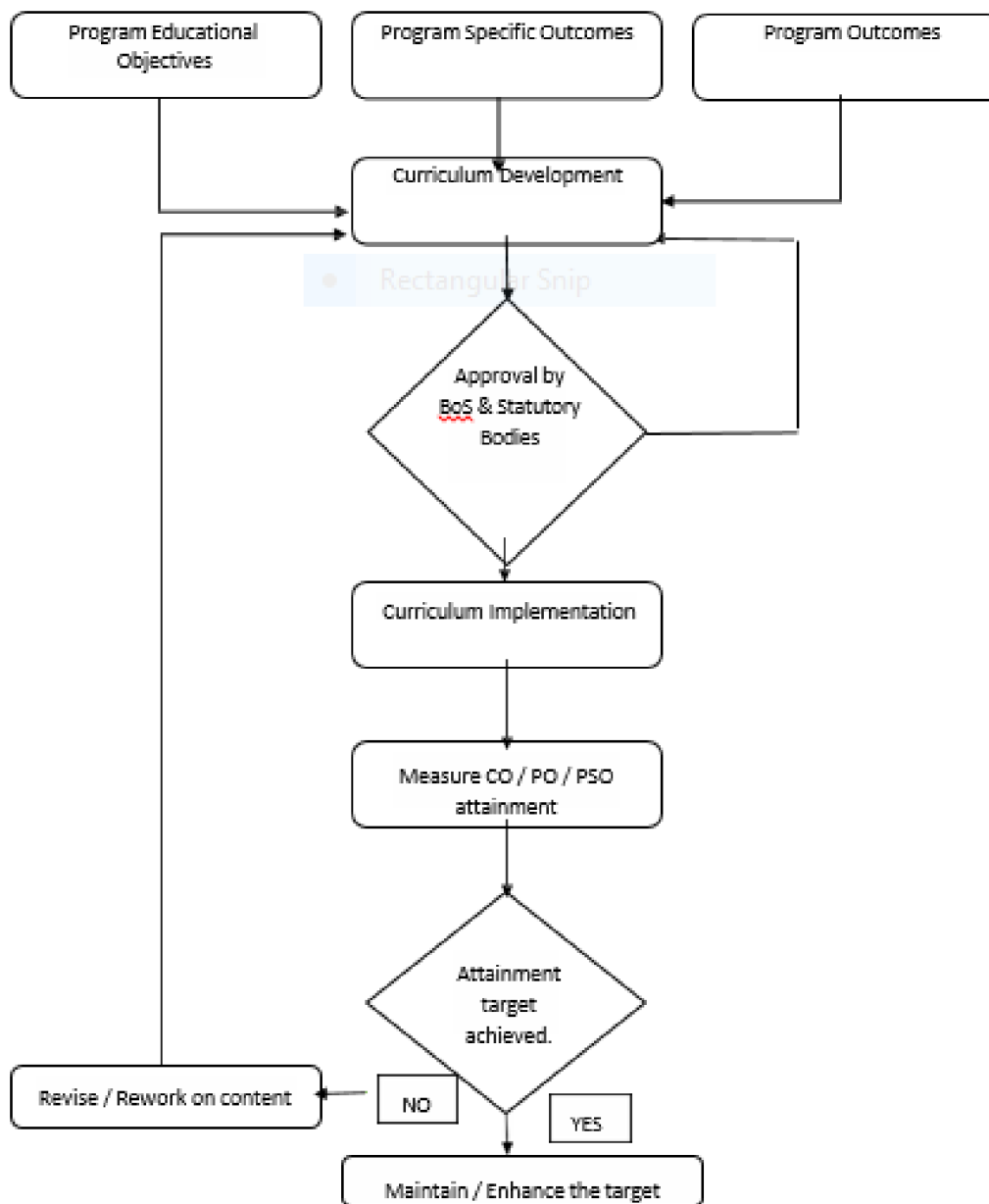
$$\text{PO/PSO Attainment} = \text{COA} \times \text{M}/3$$

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	-	-	-	-	-	-	2	2	3	2	2
CO2	2	2	2	2	1	-	1	-	-	-	2	2	3	3	2
CO3	2	2	2	2	2	-	-	-	-	-	2	2	3	2	3
CO4	3	3	3	3	-	1	1	1	1	1	2	2	3	3	2
Average	2.25	2.25	2.25	1.75	0.75	0.25	0.5	0.25	0.25	0.25	2	2	3	2.5	2.25

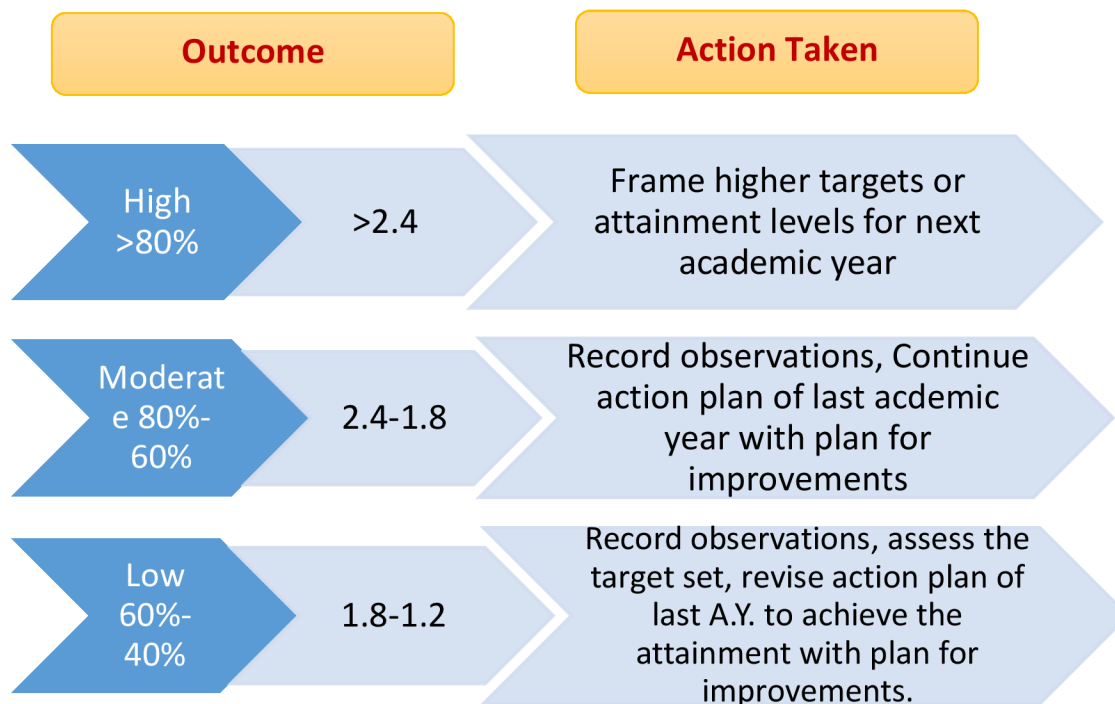
PO Attainment Calculations															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Average Mapping (M)	2.25	2.25	2.25	1.75	0.75	0.25	0.5	0.25	0.25	0.25	2	2	3	2.5	2.25
PO / PSO Attainment Level*	2.01	2.01	2.01	1.56	0.67	0.22	0.45	0.22	0.22	0.22	1.79	1.79	2.68	2.2333	2.01
* = COA x M/3															

## 4. Measures for continuous improvement

### Process to ensure the compliance & attainment of POs & PSOs



### Contribution of CO in PO attainment and Continuous Improvement



**Note:** Not attained <40% (Action Taken: Record observations, Critical assessment of target, and Revise action plan of last A.Y. at faculty/department level)

All PO's can be adequately addressed through the selection of core courses and their CO's. If assessment is in alignment with CO's, then the performance of the students indicates the CO attainment. These measurements provide the basis for continuous improvement in the quality of learning. The attainment at Course Level, Programme Level and Institutional Level ensures the quality assurance for the stake holders. All the attainment analysis is made to provide continuous improvement through either in course delivery, assessment and Curriculum.

## *Course Outcomes*

Establishing clear course outcomes has many benefits for both students and Faculty. Some of these benefits include:

**Improved student learning:** By clearly defining the expected outcomes for a course, students have a clear understanding of what they are expected to learn, which can help them focus their efforts and achieve better learning outcomes.

**Increased student motivation:** When students know what they are working towards, they are more likely to be motivated to engage with the course material and achieve the learning goals. **Better course design:** Developing clear course outcomes requires careful consideration of what students need to learn and how best to help them to achieve that learning. This process can lead to a better-designed course that is more effective at promoting student learning.

**Improved assessment:** When course outcomes are clear and well-defined, it is easier for instructors to assess student learning and determine whether students are meeting the desired outcomes.

**Increased accountability:** With clear course outcomes, both students and faculty are held accountable for achieving the learning goals. This can help to maintain a focus on student learning and ensure that the course is meeting its objectives.

Developing effective course outcomes is an important part of creating a well-designed course. Here are some strategies for writing and measuring effective course outcomes:

**Start with the end in mind:** Identify the overarching goals and objectives of the course, and consider what students should be able to know and do by the end of the course.

**Write measurable outcomes:** The outcomes should be specific, measurable, and achievable. Avoid using vague language such as “understand” or “be familiar with.” Instead, use action verbs such as “analyse,” “evaluate,” or “synthesize.”

**Align outcomes with assessment methods:** Consider how you will measure the attainment of each outcome. This could include exams, essays, projects, or presentations. Make sure that the assessment methods align with the outcomes.

**Use a variety of assessment methods:** Using a variety of methods can provide a more comprehensive picture of student learning. For example, you might use multiple choice exams to assess knowledge, and essays or projects to assess higher order thinking skills.

**Assess student learning regularly:** Regular assessment helps to keep students on track and provides opportunities for mid-course correction. It also helps to establish a culture of assessment in the course.

**Provide feedback to students:** Feedback is a key component of effective assessment. It should be timely, specific, and meaningful, and it should help students understand what they have done well and where they need to improve.

**Reflect and revise:** After each course, reflect on the outcomes and the assessment methods used. Consider what worked well and what could be improved, and revise the outcomes and assessment methods accordingly.

\*\*\*\*\*