Year 2022-2025

MANAGED BY: THE SURATEE SUNNI VOHRA MUSLIM EDUCATION SOCIETY, SURAT.

Institute Manual
Outcome Base Education (OBE)

College Website: https://www.aydadabhaitech.org

Kosamba – Mahuvej Road, Behind Old Mariyam Bai Hospital,
Kosamba-394120, Dist- Surat, Gujarat.

About Institute

A. Y. Dadabhai Technical Institute (AYDTI) is a premier polytechnic institute located in Kosamba, Surat District, offering top-notch technical education to students aspiring to excel in engineering and technology. Established under the management of **The Suratee Sunni Vohra Muslim Education Society (Reg No: F-14)**, AYDTI is dedicated to fostering innovation, skill development, and academic excellence.

Our Credentials

Approved By:	All India Council for Technical Education (AICTE), New Delhi. (Permanent ID: 1-404292091)
Affiliated with:	Gujarat Technological University, Ahmedabad. (Institute Code: 601)
Accredited by NBA:	Four programs (Civil, Mechanical, Computer, and Electrical Engineering).
Ranked by GSIRF:	Recognized for academic excellence and infrastructure.
IIC Registration:	A.Y. Dadabhai Technical Institute (AYDTI) is registered in the IIC portal with **IIC ID:** IC202217034
AISHE Code:	C-364.
National Scholarship Portal ID:	GJ-C07106

Programs Offered

At **A.Y. Dadabhai Technical Institute**, we provide a range of diploma programs aimed at equipping students with technical expertise and practical knowledge.

Sr. No.	Branch	Duration	Intake	Establishment Year
1	Diploma in Civil Engineering	3 Years	60	2008
2	Diploma in Computer Engineering	3 Years	120	2009
3	Diploma in Electrical Engineering	3 Years	60	2008
4	Diploma in Mechanical Engineering	3 Years	60	2008
5	Diploma in Information Technology	3 Years	60	2023

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Abbreviations:

OBE	Outcome Based Education	**BTL**	Bloom's Taxonomy Level
LOT	Lower Order Thinking	**HOT**	Higher Order Thinking
PEO	Program Educational Objectives	**PO**	Program Outcome
CO	Course Outcome	**PSO**	Program Specific Outcome
ESE	End Semester Examination	**PA**	Progressive Assessment
GTU	Gujarat Technological University	**TW**	Term Work
TH	Theory	**PR**	Practical
PAC	Program Assessment Committee	**DAC**	Department Advisory Committee

Important Definitions

1. Course is defined as a theory, practical or theory cum practical subject studied in a semester. For Eg. Engineering Mathematics.

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. Generally three or more course outcomes may be specified for each course based on its weightage.

3. Programme is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For Example: B.E., Marine Engineering

4. Programme 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): The Programme Educational Objectives 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. Programme Specific Outcomes (PSO): Programme Specific Outcomes 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 programme.

7. Graduate Attributes (GA): The graduate attributes, 12 in numbers are exemplars of the attributes expected of a graduate from an accredited programme.

8. End Semester Examination: ESE means the examinations to be held at the end of each semester separately for theory & practical part by the GTU.

9. Progressive Assessment: Continuous Internal assessment is a form of educational examination that evaluates a student's progress throughout a prescribed course.

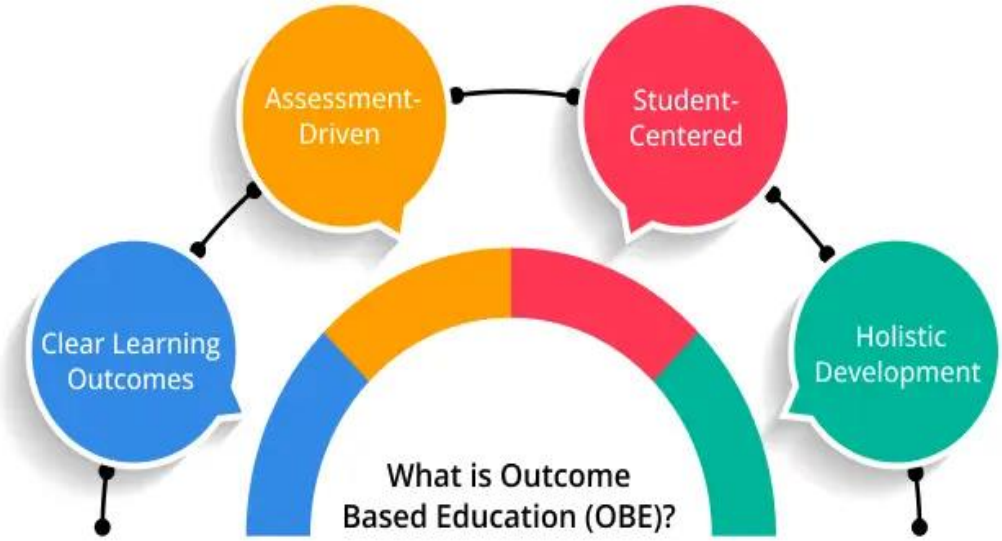
10. Bloom's Taxonomy Level: There are six levels of cognitive learning according to the revised version of Bloom's Taxonomy. Each level is conceptually different. The six levels are remembering, understanding, applying, analyzing, evaluating, and creating.

11. Lower order Thinking: The lower-order thinking skills include Remembering, Understanding and Applying.

12. Higher order Thinking: refer to skills that go beyond memorizing information.

Introduction

Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery, 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 the Outcome Based Education.



Why OBE?

1. International recognition and global employment opportunities.

2. More employable and innovative diploma graduates with professional and soft skills, social responsibility and ethics.

3. Better visibility and reputation of the technical institution among stakeholders.

4. Improving the commitment and involvement of all the stakeholders.

5. Enabling diploma graduates to excel in their profession and accomplish greater heights in their careers.

6. Preparing diploma graduates for the leadership positions and challenging them and making them aware of the opportunities in the technology development.

Benefits of OBE

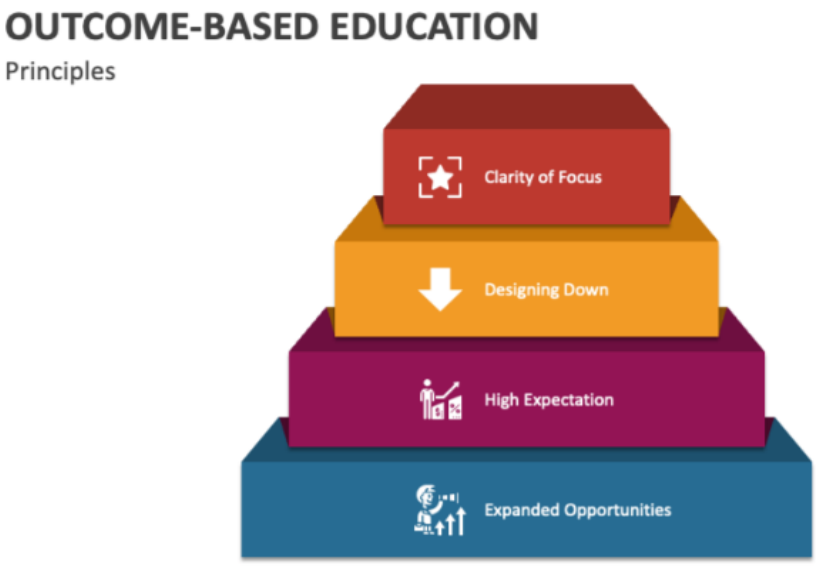
Clarity: The focus on outcome creates a clear expectation of what needs to be accomplished by the end of the course.

Flexibility: With a clear sense of what needs to be accomplished, instructors will be able to structure their lessons around the students' needs.

Comparison: OBE can be compared across the individual, class, batch, program and institute levels.

Involvement: Students are expected to do their own learning. Increased student involvement allows them to feel responsible for their own learning, and they should learn more through this individual learning.

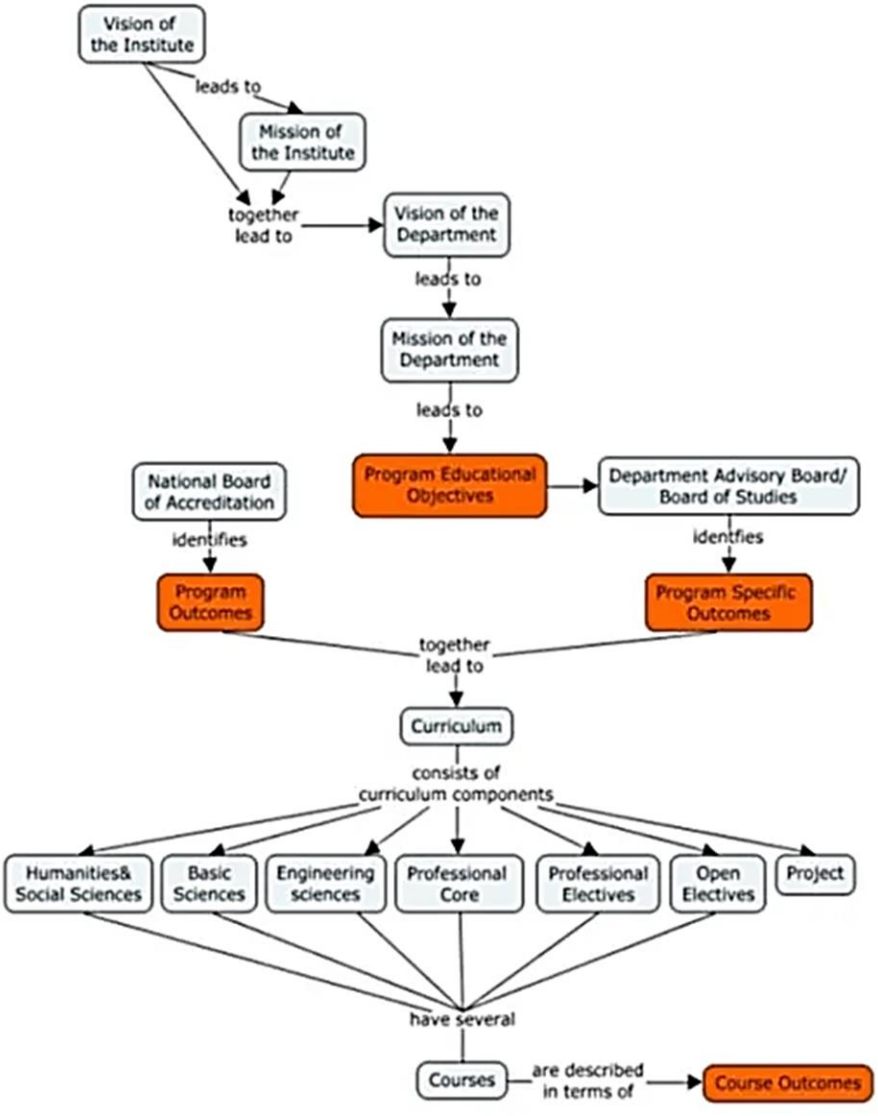
Outcome-Based Education Principles



OBE Principles	Redesign Issues	How to implement
Clarity of focus	Focus on what learners will be able to do successfully	• Help learners develop competencies • Enable predetermined significant outcomes • Clarify short & long term learning intentions • Focus assessments on significant outcomes
Design down	Begin curriculum design with a clear definition of what learners are to achieve by the end of their formal education	• Develop systematic education curricula • Trace back from desired end results • Identity "learning building blocks" • Link planning, teaching & assessment decisions to significant learner outcomes
High expectations	Establish high, challenging performance standards	• Engage deeply with issues of learning • Push beyond where learners would normally have gone
Expanded opportunities	Do not learn the same thing in the same way in the same time	• Provide multiple learning opportunities matching learner's needs with teaching techniques

India, OBE and Accreditation

From 13th June 2014, India has become the permanent signatory member of the Washington Accord. Implementation of OBE in higher technical education also started in India. The National 5 Assessment and Accreditation Council (NAAC) and National Board of Accreditation (NBA) are the autonomous bodies for promoting global quality standards for technical education in India. NBA has started accrediting only the programs running with OBE from 2013. The National Board of Accreditation mandates establishing a culture of outcome-based education in institutions that offer Engineering, Pharmacy, Management program. Reports of outcome analysis help to find gaps and carryout continuous improvements in the education system of an Institute, which is very essential.



Outcomes and Objectives in NBA framework

Features of OBE:

- OBE is an educational process that focuses on what students can do or the qualities they should develop after they are taught.
- It involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of higher order learning and mastery rather than accumulation of course credits.
- Both structures and curricula are designed to achieve those capabilities or qualities in OBE.
- It discourages traditional education approaches based on direct instruction of facts and standard methods.
- It requires that the students demonstrate that they have learnt the required skills and content.

Deficiencies in Traditional education

- Provides students with a learning environment with little attention to whether or not students ever learn the material.
- Students are given grades and rankings compared to each other – students become exam oriented or CGPA driven. Graduates are not completely prepared for the workforce.
- Lack of emphasis on soft skills needed in jobs e.g. communication skills, interpersonal skills, analytical skills, working attitude etc.

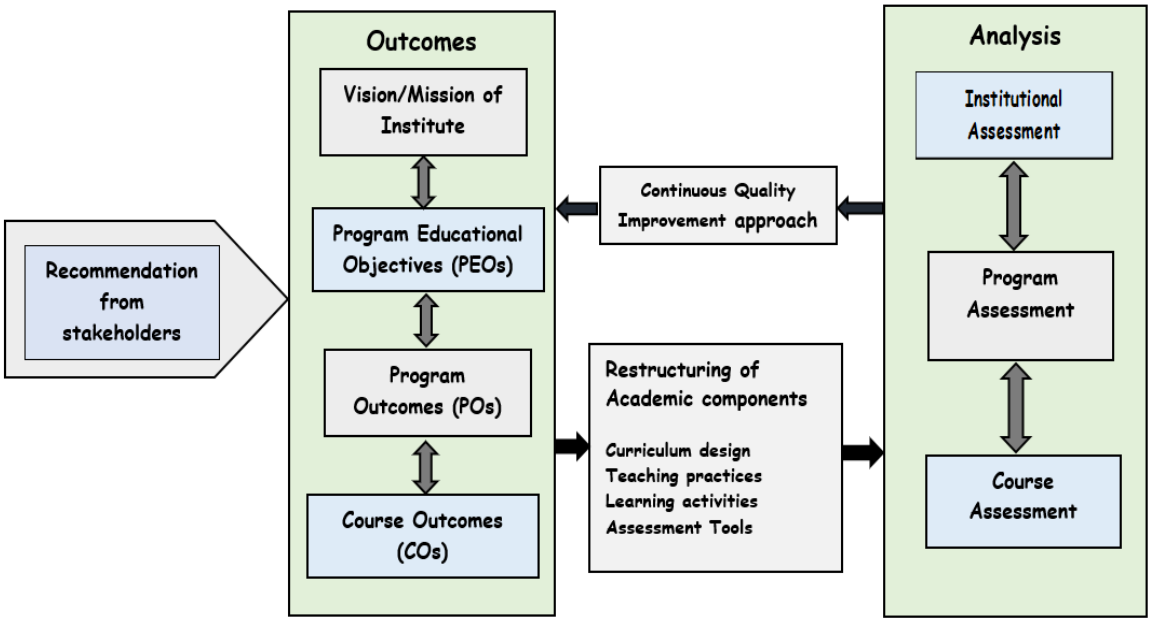
Expectations of students under OBE – the outcome

- Students are expected to be able to do more challenging tasks other than memorize and reproduce what was taught.
- Students should be able to: write project proposals, complete projects, analyze case studies, give presentations, show their abilities to think, question, research, and make decisions based on the findings.
- Be more creative, able to analyse and synthesize information.
- Able to plan and organize tasks, able to work in a team as a community or in entrepreneurial service teams to propose solutions to problems and market their solutions.
- Students should be enriched on three dimensional scales of knowledge, skill and attitude throughout the course.

The OBE model measures the progress of the graduate in three parameters

- Program Educational Objectives (PEO)
- Program Outcomes (PO)
- Course Outcomes (CO)

OBE – Framework in the Institute



1) Institute Vision and Mission

Vision	To impart globally competitive education to all its students, enabling them to fulfil effectively the technological and socio-economic needs of society in a sustainable manner.
Mission	**Skill-Based Training** Develop technical human resources by imparting state-of-the-art skill-based training programs tailored to regional and global needs.
	Innovation and Entrepreneurship Nurture innovation and entrepreneurship among faculty and students, creating opportunities for meaningful and long-term interaction with academia and industries.
	Accountable Governance Ensure effective and transparent governance in all aspects of the institute's functioning to benefit its stakeholders.

1.1) Department Vision and Mission

1. Civil Engineering Department

Vision	To impart knowledge of civil engineering with global perspective to the students and make them technologically creative, ethically strong to meet the ever-changing needs of nation.

Mission	• M1 - Implementing vibrant academic curriculum and various extracurricular activities.
	• M2 - Develop professional skills to serve globally in all aspects of civil engineering.
	• M3 - Inculcate social awareness and responsibility in students to serve the society in sustainable manner.

2. Computer Engineering Department

Vision	To develop the department into an advanced centre of learning to train its students to become computer engineers for contributing towards ever changing needs of the digital world in an effective manner.
Mission	• Provide knowledge and skills in accordance with ever changing trends in the market through effective pedagogies and hands on experience on latest tools and technologies.
	• Encourage engineers for innovation and entrepreneurship through lifelong learning capabilities to fulfil transitional global needs of modern society and industry.
	• Enforce crystalline policies and effectively manage multidisciplinary activities for the benefits of all stake holders.

3. Electrical Engineering Department

Vision	To prepare electrical engineers by imparting innovative technical knowledge and skills for ever-changing needs of industries for sustainable development.
Mission	• Prepare cadre of electrical engineers to cater to industrial development and economic growth of country.
	• Educate and train electrical engineers to meet ever changing requirements of industries.
	• Students will be made to interact with industries and other academic institution to serve society safety, effectively & efficiently.

4. Mechanical Engineering Department

Vision	To groom self-esteemed and creative human potential by enhancing their technical skills to make them market ready in the field of mechanical engineering.
Mission	• To educate and mentor students to excel as professional by imparting them core knowledge of mechanical engineering.
	• Nurture students with innovation and entrepreneurship skills to develop divergent thinking respond productively to the needs of the industries and society.
	• Constantly strive to good governance in technical and soft skill along-with ethics and humanities.

2) Program Educational Objectives (PEOs)

Program Educational Objectives (PEOs) should be defined by the Head of the Department in Consultation with the faculty members. PEOs are a promise by the department to the aspiring Students about what they will achieve once they join the programme. PEO assessment is not Made compulsory by NBA as it is quite difficult to measure in Indian context.

PEOs Of various programs in the institute are as follows
After completing the diploma engineering program students will be able to

1. Civil Engineering

PEO1 - Pursue technical knowledge & Project Management skills with entry-level civil engineering Profession.

PEO2 - Engage in lifelong learning to meet the challenges facing the profession & higher studies.

PEO3 - Having moral value & to contend with recent development in the field of civil engineering.

2. Computer engineering

PEO1 - Preparation:

To educate diploma graduates having strong basic fundamentals, field knowledge and technical skills which is necessary for employment or higher education

PEO2 - Professionalism:

To prepare undergraduates having understanding and appreciation of strong professional ethics and values, social responsibility, effective communication and leadership skills to become productive engineers both as individuals and in team environment.

PEO3 - Lifelong Learning:

To prepare committed diploma graduates capable of adopting new technologies and elevate their skills through professional practice, further education and training towards lifelong learning.

3. Electrical Engineering

PEO1 - Prepare students so that they are technically qualified to analyse complex problems, design create new products& are able to apply skills in engineering domain.

PEO2 - Excel in technical profession, industry OR higher education by providing strong foundation in mathematics Science and Engineering.

PEO3 - Create professional and ethical attitude. Better communication skills and relate engineering issues to address technical and social challenges.

4. Mechanical Engineering

PEO1 -Successfully practice or apply the principles of Mechanical Engineering in a variety of employment areas.

PEO2 -Achieve profession success with an understanding and appreciation of ethical behaviour, social responsibility, and diversity, both as individuals and in team environments with environment awareness.

PEO3 -Pursue continued life-long learning through professional practice, further graduate education or other training programs in engineering science or other professional fields.

3) Program Outcomes (POs)

POs are to be in line with the graduate attributes as specified in the Washington Accord. POs Are to be specific, measurable and achievable. NBA has well-defined 7 POs and it is common for all the institutions in India. In the curriculum given to students, there should be clear mention of course objectives and course outcomes along with CO-PO course articulation matrix for all the courses.

PO1: Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering Problems.

PO2: Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods

PO3: Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs

PO4: Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
PO5: Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices

PO6: Project Management: Use engineering management principles individually, as a team Member or a leader to manage projects and effectively communicate about well-defined Engineering activities.

PO7: Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.

4) Program Specific Outcomes (PSOs)

Program Specific Outcomes (PSOs) are statements that describe what the diploma graduates of a specific engineering program should be able to do. A list of PSOs written by various programs in the institute is given below.

1. Civil Engineering

PSO1 –The civil engineers will able to apply specific program principles of Design, Drawing, planning, surveying, estimating, construction and documentation of basic civil engineering.

PSO2 –The civil engineers will able to use knowledge in Material technology domains to provide solutions, innovations and engage in lifelong learning for professional growth.

2. Computer engineering

PSO1 –Ability to apply logical and mathematical strategic to solve complex computational and Real time problems using proper data structure and appropriate algorithm.

PSO2 –Ability to understand principles and working of computer system and all the security Concerns regarding network and Software application.

PSO3 –Ability to understand design, development and testing methodologies of Software, Networking and Mobile Application.

3. Electrical Engineering

PSO1 –Work professionally to apply principles of electrical engineering and enhance technical skills as per industry and society need.

PSO2 –To select estimate and interpret data's of electrical and electronics system and to test and maintain various electrical equipment and suggest remedial measures.

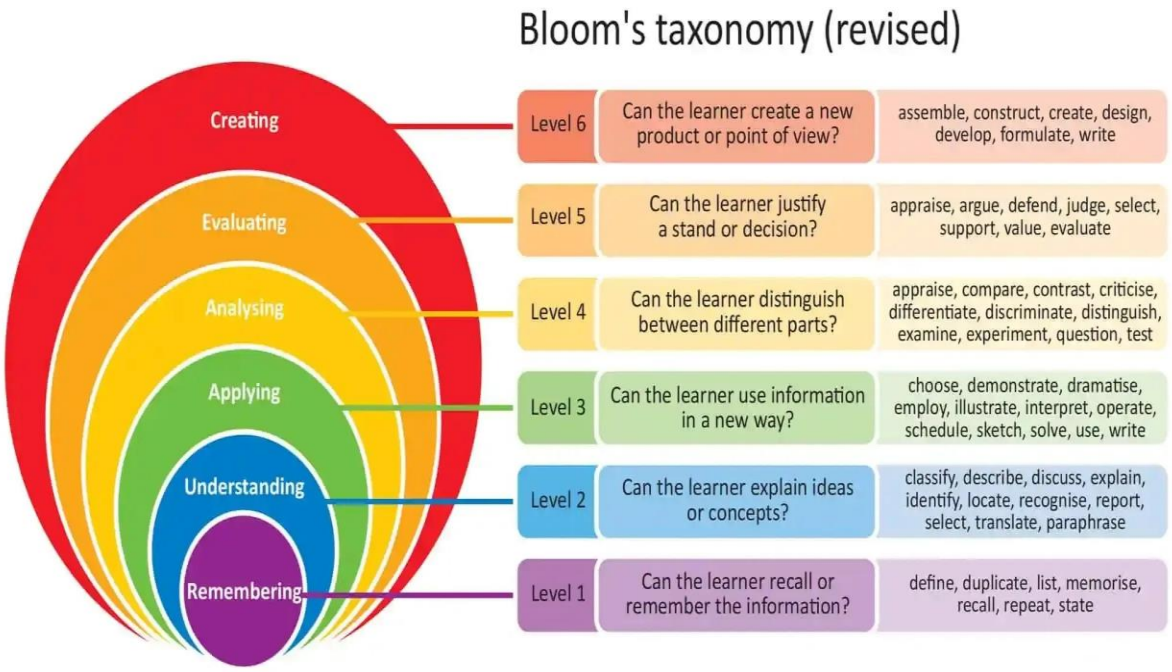
4. Mechanical Engineering

PSO1 –The Mechanical Engineers will be able to comprehend and apply the concept of CAD/CAM in engineering industries.

PSO2 –The Mechanical Engineers will be able to work in manufacturing industries in the field of Operations, Maintenance & Installations.

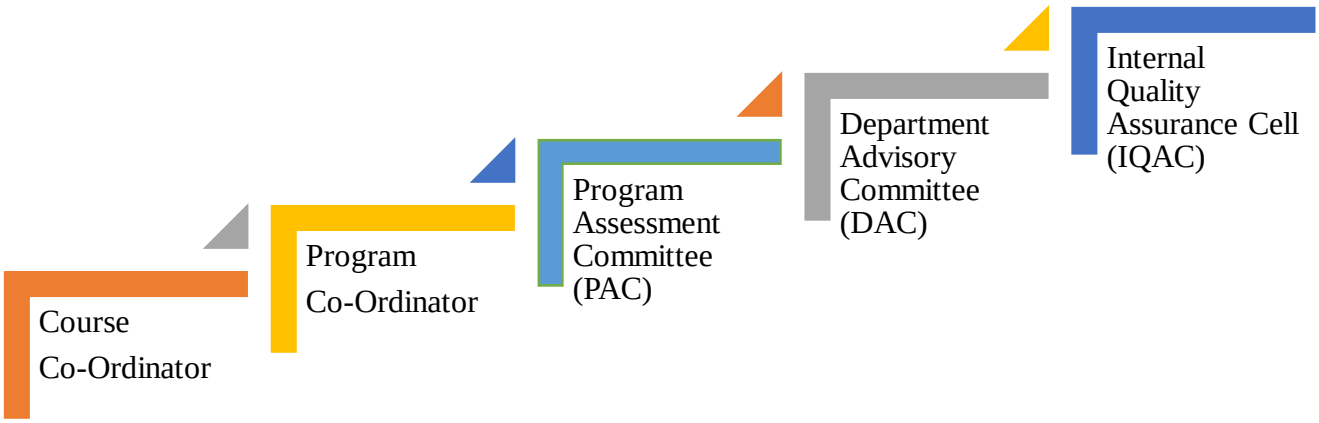
Blooms Taxonomy

Bloom's taxonomy is considered as the global language for education. Bloom's Taxonomy is frequently used by teachers in writing the course outcomes as it provides a readymade structure and list of action verbs.

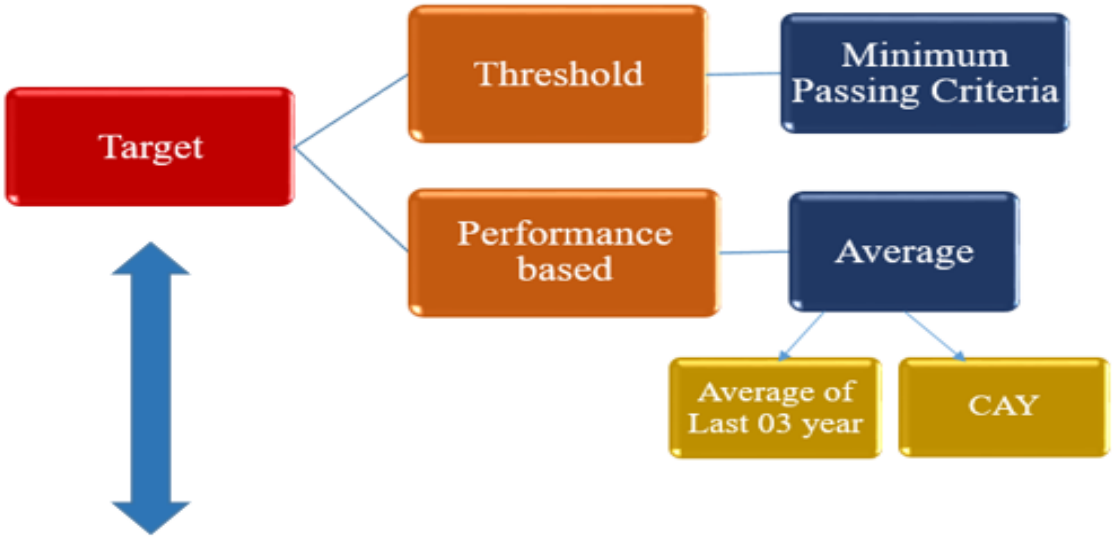


Lower Order Thinking (LOT)			**Higher Order Thinking (HOT)**		
Remember	**Understand**	**Apply**	**Analyse**	**Evaluate**	**Create**
Define	Explain	Solve	Analyse	Reframe	Design
Describe	Describe	Apply	Compare	Criticize	Create
List	Interpret	Illustrate	Classify	Judge	Plan
State	Summarize	Calculate	Distinguish	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

Administrative Setup for OBE/Assessment



Setting of Targets and Attainment Levels



Threshold % for attainment	**35**
Levels of Attainment	
3 ≥ 70% students cross threshold value	High
2 ≥ 60% students cross threshold value	Med
1 ≥ 50% students cross threshold value	Low

- **Target for PO/PSO attainment = (80% of average mapping value of Course-PO/PSO matrix) + (20% of 3)**
- **The program committee may decide the percentage of above value at initial stages.**

Overall CO assessment and attainment process

Course outcome assessment and attainment	
Direct Assessment and attainment	
External Assessment Tools (50 % weightage)	Internal Assessment Tools (50% weightage)
GTU End semester Examination (ESE) (TH, PR,)	2- Mid Semester Exam (TH) End semester Examination (PR) Progressive assessment (PR-PA) Micro project (PA)
[A] Find 50% of overall attainment External and place that value here	[B] Find 50% of overall attainment Internal and place that value here
[C] Overall CO Attainment Level = [A] + [B]	

Attainment of Program Outcomes & Program Specific Outcomes

The table given below describes the assessment tools and processes used for assessing the attainment of each POs and PSOs.

Attainment	Correlation values used	Assessment Process
DIRECT PO/PSO-ATTAINMENT (80%)	OVERALL CO-ATTAINMENT	
OVERALL CO-attainment obtained is used in direct PO/PSO attainment.		
	Assessment Tools used	Assessment Process
INDIRECT PO/PSO-ATTAINMENT (20%)	□ Program Exit Survey: (Once in a year for passed out students)	□ The objective type questionnaire based on program outcome is prepared by the program coordinator. □ Feedback of students is analyzed using said questionnaires.
□ **20 % of the Correlation value (Program Exit Survey) obtained is used in indirect PO/PSO attainment**.		

The POs and PSOs are evaluated by adding attainment from direct attainment (80%) and indirect attainment (20%). The derived attainment level is compared with the desired attainment level to check the attained POs & PSOs. The POs & PSOs which are not attained for concerned academic year are highlighted and the required action plans are prepared for the same and executed in next academic year.

A.Y. DADABHAI TECHNICAL INSTITUTE, KOSAMBA

MECHANICAL ENGINEERING DEPARTMENT

ATTAINMENT SHEET (Winter-2023)

Semester: 3rd

SUBJECT: STRENGTH OF MATERIALS (4331904) FACULTY NAME:

		Target (%)	Internal																														External				
	Theory	0.35	MID - 1								MID - 2								Micro Project		PA Theory	PA (Practical)													ESE (Practical)		GTU GRADE	AA	AB	BB	BC
	Practical	0.50		Targ at level		Targ at level		Targ at level		Targ at level		Targ at level		Target level		Targ at level		Targ at level	Marks	Targ at level			Targ at level		Targ at level		Targ at level		Targ at level		Targ at level		PA Total		Targ at level		CC	CD	DD	FF
		COs	CO 1	0.35	CO 4	0.35	CO 5	0.35	CO	0.35	CO 2	0.35	CO 3	0.35	CO 4	0.35	CO 6	0.35		0.35		CO 1	0.50	CO 2	0.50	CO 3	0.50	CO 4	0.50	CO 5	0.50	CO 6	0.50		Total	0.50	GTU Theory Grade	Total		0.35	
Sr. No.	Student's enrollment	Student's name	8	4	6	3	6	3		0	4	2	8	4	5	2.5	3	1.5	10	5	30	25	12.5	25	15	25	15	25	15	25	15	25	7.5	25	25	12.5		70		24.5	
1	226010319001	ABHINANDANKUMAR	7	Y	1	N	2	N		Y	4	Y	4	Y	3	Y	0	N	7	Y	18	14	Y	15	Y	14	N	19	Y	20	Y	21	Y	17	16	Y	FF	0	0	N	
2	226010319002	ANSARIDANISHHAIMANSARI	0	N	0	N	0	N		Y	1	N	0	N	0	N	0	N	6	Y	13	10	Y	19	Y	15	Y	14	N	17	Y	14	Y	16	17	Y	FF	0	0	N	
3	226010319004	ATODARIYAYUVRAJSINHPRADEEPSINH	8	Y	5	Y	4	Y		Y	4	Y	7	Y	4	Y	1	N	9	Y	26	22	Y	21	Y	23	Y	22	Y	20	Y	22	Y	22	23	Y	FF	0	0	N	
57	8888888888	VASAVA HINAKUMAR CHUNILALKUMAR	8	Y	6	Y	0	N		Y	1	N	3	N	2	N	0	N	7	Y	17	20	Y	21	Y	21	Y	22	Y	19	Y	20	Y	21	21	Y	FF	0	0	N	
	Total number of Students	57																																						
		Y		3		2		1		4		2		2		2		0		4			4		4		3		3		4		4			4			0	
		N		1		2		3		0		2		2		2		4		0			0		0		1		1		0		0			0			4	
		% of Students Achived Threshold marks		5.26		3.51		1.75		7.02		3.51		3.51		3.51		0.00		7.02			7.02		7.02		5.26		5.26		7.02		7.02			7.02			0.00	
		Attainment Level		0		0		0		0		0		0		0		0		0			0		0		0		0		0		0			0			0	
			CO 1		CO 4		CO 5		CO		CO 2		CO 3		CO 4		CO 6					CO 1		CO 2		CO 3		CO 4		CO 5		CO 6								
			MID - 1								MID - 2								MP			PA_PR													ESE_PR			ESE_TH			

Overall CO Attainment Calculations

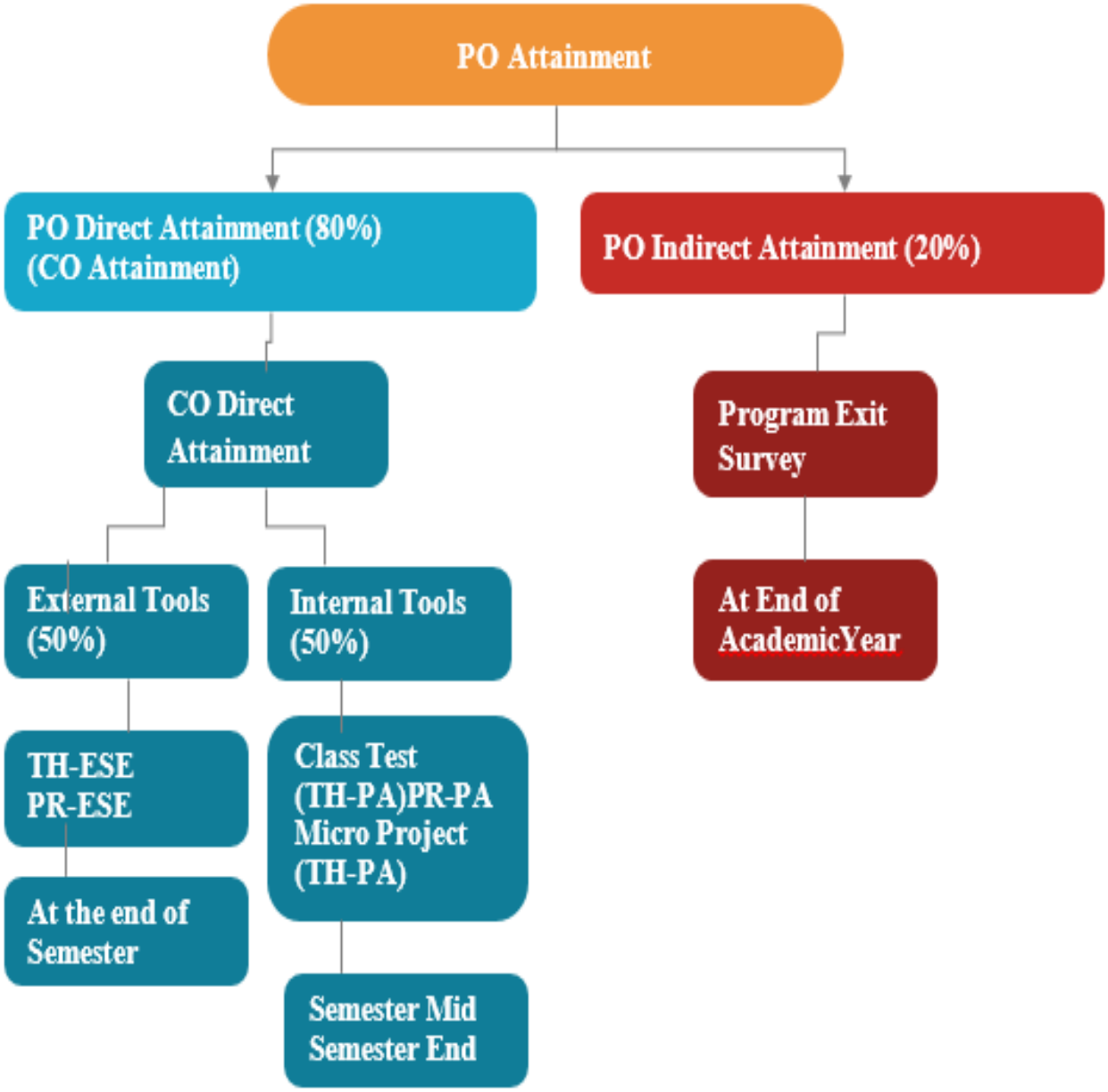
	INTERNAL						External	CO-WISE ATTAINMENT
COs	MID-1	MID-2	MP	PA_PR	ESE_PR	Internal AVG.	ESE_TH	
CO1	3		3	3	3	3.00	0.00	1.50
CO2		2	3	3	3	2.50	0.00	1.25
CO3		0	3	3	3	1.50	0.00	0.75
CO4	1	0	3	3	3	1.33	0.00	0.67
CO5	0	1	3	3	3	1.33	0.00	0.67
CO6		0	3	3	3	1.50	0.00	0.75
Attainment						1.86	0.00	
Final overall CO Attainment						0.93		

CO-PO Mapping

SUBJECT: S.O.M. (4341904)

C306	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
C306.1	2	3		3	2	2	2		
C306.2	2	3		2	2	2	2		
C306.3	2	3			2	2	2		
C306.4	2	3		3	2	2	2		
C306.5	2	3		3	2	2	2		
C306.6	2	3		2	2	2	2		
AVERAGE	2.00	3.00	#####	2.60	2.00	2.00	2.00	#####	#####
ATTAINMENT	0.62	0.93	#####	0.81	0.62	0.62	0.62	#####	#####

PO Attainment Flow Chart



Setting up Action Plan for Improvements

The attainment values for a particular batch are evaluated as per the processes stated. These values are then compared with the set attainment levels for a particular batch. If the Target Attainment level for a particular PO or PSO is not reached, then as per the policy, specific improvements are initiated.

Observations are recorded regarding the attainment of each PO/PSO against set target.

The Action Plan for improvements depends on the POs as follows:

- For POs in the Knowledge domain, namely PO1 and PO2, the action plan includes focus on improving the students' knowledge through lectures, tutorials, pre-requisite courses, numerical practice, and extra tests and so on.

- For POs in the Skill Domain namely PO3 to PO6, the action plan includes more focus on laboratories, including experiments, industrial training on equipment and software etc.

- For POs in the Attitude domain, i.e., PO7 the improvement actions include expert lectures, industrial visits and industrial training, enhanced capstone projects, focus on extension activities along with co-curricular and extra-curricular activities, internships, encouragement to participate in and organize technical events and competitions.

Continuous Improvement

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

Outcome	**Action to be taken by faculty**
High attainment of all CO-PO (>2.5 out of 3)	Set new higher targets or attainment levels for next Academic Year (A.Y.).
Moderate attainment of all CO-PO (1.8 to 2.49 out of 3)	Record observations, Continue action plan of last A.Y. with plan for improvements.
Low attainment of all CO- PO (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.