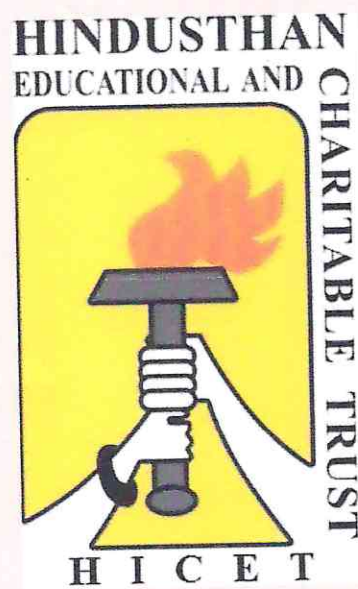


HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution)

Coimbatore – 641 032



OUTCOME BASED EDUCATION MANUAL R-2020

DEPARTMENT OF COMPUTER APPLICATIONS (MCA)

December 2020

PREFACE

This manual is a reference to help faculty members and Stakeholders to understand the Outcome Based Education (OBE) system implemented in the Department of Computer Applications at Hindusthan College of Engineering and Technology (HICET). . This manual provides a detailed description of Outcome Based Education implementation at all the four stages of educational process including Curriculum design, Teaching and Learning process, Assessment & Evaluation and Continuous quality improvement. Also it provides suitable guidelines for the faculty members to develop the course plan, assessment plan etc., in the process to measure the outcome of the students during their course of study and also after their graduation.

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ABOUT THE INSTITUTE

Hindusthan College of Engineering and Technology was established in the year 2000 and offers 15 UG, 7 PG and PhD programmes. The college is approved by the All India Council of Technical Education (AICTE), New Delhi and affiliated to Anna University, Chennai. Five UG programmes: CSE, ECE, EEE, IT, MECH are accredited by NBA. The Institution is accredited with 'A' Grade (CGPA of 3.07 out of 4 in Cycle 1) by NAAC. The College is certified with ISO 9001:2015. Also the institution is Autonomous from the academic year 2016-2017 onwards.

HICET works with the vision of producing qualified Engineering Professionals adorned with moral values and technical skill to uphold jobs at global level. The strength of the institution is the team of well experienced Professors who involve themselves in grooming the students on par with global standard. The institution offers outcome based curriculum and student centric learning.

ABOUT THE DEPARTMENT

The Department of Computer Applications was established in the academic year 2005 - 2006 with the intake of 60. It is an autonomous institution affiliated to Anna University, Chennai. We strive to develop and maintain our high quality in teaching learning process and making responsive and self disciplined individuals who would work for the upliftment of the nation as a whole. The department has a diversified mix of students from varied backgrounds such as computer science, Mathematics, Electronics and Non computer science. This myriad group of students plays a major role in strengthening the overall development of students.

INSTITUTE – VISION

To become a premier institution by producing professionals with strong technical knowledge, innovative research skills and high ethical values.

INSTITUTE – MISSION

IM1: To provide academic excellence in technical education through novel teaching methods.

IM2: To empower students with creative skills and leadership qualities.

IM3: To produce dedicated professionals with social responsibility.

DEPARTMENT – VISION

To be a center of excellence dedicated to providing education in computer applications, fostering a learning environment that cultivates professionals capable of contributing to innovation and social development.

DEPARTMENT – MISSION

DM1: To excel in computer applications education by implementing innovative teaching methods, striving for academic excellence.

DM2: To empower students with creative skills and leadership qualities, fostering an environment that encourages innovation and readies them for successful professional careers.

DM3: To emphasize ethical practices in technology, ensuring that our graduates make meaningful contributions to society by utilizing their expertise for the greater good.

1.PRIMARY DEFINITIONS AND NOMENCLATURE

Vision: A vision statement is a document that states the current and future objectives of a Department. The vision statement is intended as a guide to help the department make decisions that align with its philosophy and declared set of goals.

Mission: The mission statement should define the broad purposes the program /department is aiming to achieve, describe the community the program /department is designed to serve, and state the values and guiding principles which define its standards.

Program Educational Objectives (PEOs): PEOs are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. Knowledge, Skill and Attitude are the three behavioral elements based on which PEOs are constructed.

Program Outcomes (POs): Program outcomes 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.

Course Outcomes (COs) : It is a detailed description of what a student must be able to do at the conclusion of a course.

Course Information Sheet (CIS): This sheet summarizes the information of a particular course and it gives the overall view of how the COs and POs are mapped in each unit.

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

End Semester Examinations (ESE): ESE means the examinations to be held at the end of each semester separately for theory & practical part on such dates as the University/College may determine.

2. OUTCOME BASED EDUCATION (OBE):

It is a process that involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of higher order learning and mastery rather than the accumulation of course credits.

Outcome-Based Education (OBE) model is being adopted in Engineering colleges now-a- days as per AICTE guidelines. It is considered as a giant leap forward to improve technical education in India and help graduates compete with their global counterparts.

Outcome based education (OBE) is student-centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes. Its focus remains on evaluation of outcomes of the program by stating the knowledge, skill and behavior a graduate is expected to attain upon completion of a program and after 3 years of graduation. In the OBE model, the required knowledge and skill sets for a particular engineering degree is predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

The induction of India in the Washington Accord in 2014 with the permanent signatory status of the National Board of Accreditation (NBA) is considered a big leap forward for the higher-education system in India. It means that a Computer Applications graduate from India can be employed in any one of the other countries who have signed the accord. For Indian Engineering Institutions to get accredited by NBA according to the pacts of the accord, it is compulsory that engineering institutions follow the Outcome Based Education (OBE) model. So, for an Engineering Institution to be accredited by NBA it should compulsorily follow the OBE model.

2.1 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.
- OBE 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.
- 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.

2.2 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.

2.3 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 case presentations, show their abilities to think, question, research, and make decisions based on the findings.
- Be more creative, able to analyze 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.

3.PROCESS OF DEFINING VISION AND MISSION OF THE DEPARTMENT

The following steps are followed to establish Vision and Mission of Department.

Step 1.The Vision & Mission of the Institute is taken as the basis.

Step 2: The Department conducts brain-storming sessions with the faculty on the skill-set required by the local and global employers, Industry Advances in Technology and R & D, and the draft copy of the Vision and Mission of the Department is drafted.

Step 3: The views from Parents, Professional Bodies, Industry representatives, Board of Studies (BOS) and Department Advisory Committee (DAC) are collected and incorporated to revise the draft version based on their inputs.

Step 4: The accepted views are analyzed and reviewed to check the consistency with the vision and mission of the institute.

4.PROCESS OF DEFINING PEOs OF THE DEPARTMENT

❖ The Program curriculum is designed by incorporating inputs from members of Board of Studies, Curriculum Development Council and Academic council constituted by members from various academic institutions, R&D organizations and industry.

❖ Inputs are obtained from alumni and other stake holders. Also the inputs are considered from reports like WEF's Future of Jobs, India skills, FICCI and Deloitte.

❖ Besides, a skill in demand analysis is carried out periodically at the Academic council, Programme Assessment Committee and Department Advisory committee to identify the core areas in the Program domain that are consistent with industry needs.

❖ The Centre of Excellence in the department is established based on core areas in the program.

❖ The PEOs are established to reflect the career and professional accomplishments of the graduates based on the three behavioral elements of Knowledge, Skill and Attitude.

5.PUBLICATION AND DISSEMINATION :

The Vision, Mission statement of the Department and Institution, CO statements, PO and PEO statements are reached to all the students and stake holders of the department. The process of publication and dissemination is described below.

- College Website
- Principal Room
- Department
- HOD Chamber
- Laboratories
- Department Library

- Classrooms
- Curriculum and Syllabi
- Lab Manuals
- Course files
- News Letter
- Department Magazines

6. THE PROGRAM OUTCOMES (POS) AS PER NBA GRADUATE ATTRIBUTES

The POs essentially indicate what the students can do from subject-wise knowledge acquired by them during the program. As such, POs define the professional profile of an graduate. Department Advisory Committee with guidance from Board of studies members have developed Program Outcomes as per Graduate Attributes prescribed by NBA. These are in line with the Graduate Attributes as defined by the Washington Accord.

1. Computational Knowledge:

Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

2. Problem Analysis:

Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

3. Design /Development of Solutions:

Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Conduct Investigations of Complex Computing Problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern Tool Usage:

Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

6. Professional Ethics:

Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

7. Life-long Learning:

Recognise the need, and have the ability, to engage in independent learning for continual development as a computing professional.

8. Project management and finance:

Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

9. Communication Efficacy:

Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

10. Societal and Environmental Concern:

Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

11. Individual and Team Work:

Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

12. Innovation and Entrepreneurship:

Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

7. COURSE OUTCOMES

7.1 Course Outcomes (COs): Statements indicate , what a student can do after the successful completion of a course. Every Course leads to some Course Outcomes. The CO statements are defined by considering the course content covered in each module of a course. For every course there may be 5 or 6 COs. The keywords used to define COs are based on Bloom's Taxonomy.

7.2 CO - PO - PEO mapping of courses

All the courses in the curriculum must cover all the POs . For a course, we map the COs to POs through the CO-PO matrix and to POs are mapped to PEOs . The various correlation levels are:

- "1" – Slight (Low) Correlation
- "2" – Moderate (Medium) Correlation
- "3" – Substantial (High) Correlation
- "-" indicates there is no correlation.

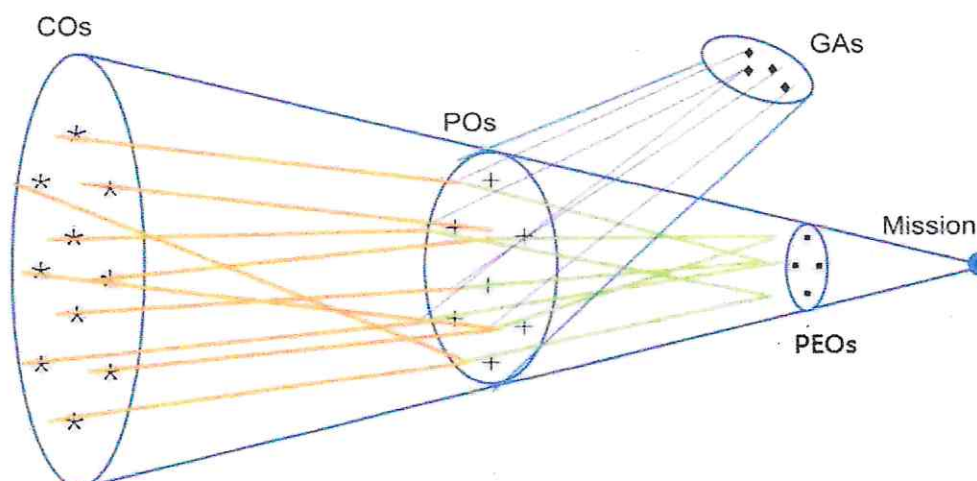


Figure 1. Mapping of the parameters of Outcome Based Education (OBE)

*Course Information Sheet (CIS) is attached as Annexure

7.3 Process involved in CO-PO Mapping

The role of CO-PO mapping will be assigned to the faculty involved in the teaching-learning process of that particular course. After the course (subject) allotment by the department, the faculties handling the subject has to write appropriate COs for their corresponding course discussing with subject handling faculty members. It should be narrower and measurable statements. By using the action verbs of learning levels (Bloom's Taxonomy), 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 behavior that students will acquire through the course.

After writing the CO statements, CO will be mapped with PO of the department. The Course Outcome attainment coordinator has to consolidate the CO's of the respective year and maintain the documentation of the CO attainment level of the respective year courses as well as documentation of the individual students extra-curricular and co-curricular activities for PO attainment evaluation.

7.4 CO attainment

Both direct and indirect method of assessment is followed for Course Outcome (CO) attainment assessment. The weightage for direct attainment is 80% while that for Indirect attainment is 20%. The various assessment tools for direct assessments are Internal Tests, Mid -Semester and End Semester Examination and Assignments .The Indirect tool used is Course Exit survey.

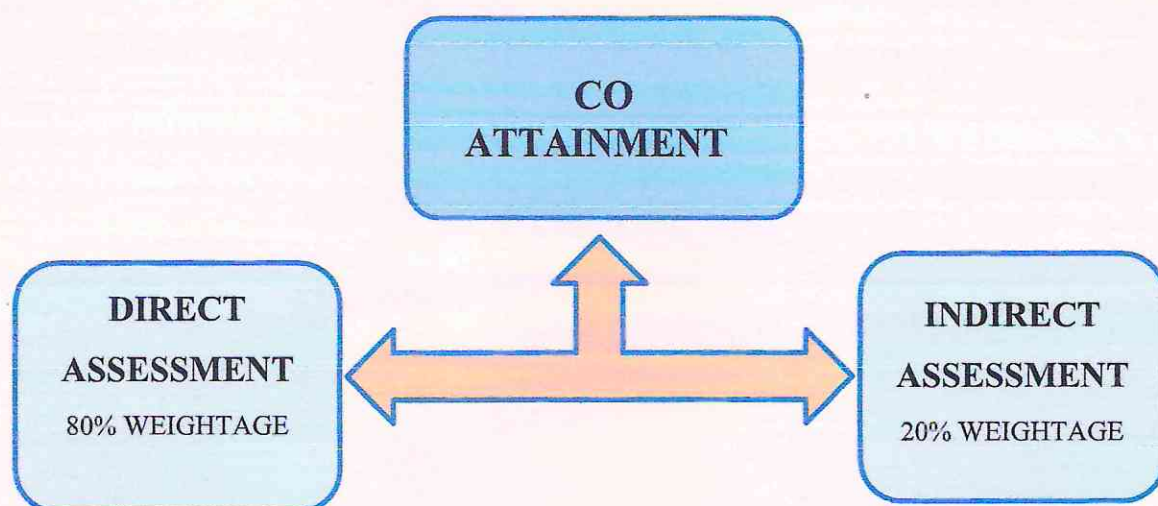


Figure 3: CO Attainment

7.5 CO assessment process for various courses in the curriculum

The curriculum is a bundle of various components like Theory courses, Theory with Lab components, Laboratory courses, Mini-Projects, Projects and Internships / Technical seminar

THEORY COURSES			
METHOD	ASSESSMENT TOOLS	MARKS	WEIGHTAGE
Direct Assessment	a. Internal Examinations and Mid-Semester Examination CO1 & CO2 – Internal Exam I CO1,CO2 & CO3 – Mid semester CO4 & CO5 - Internal Exam II	20	80%
	b. Any 4 internal components	20	
	c. End Semester Examinations	60	
	Total Marks	100	
Indirect Assessment	Course Exit Survey	5	20%

THEORY WITH LAB COMPONENT COURSES			
METHOD	ASSESSMENT TOOLS	MARKS	WEIGHTAGE
Direct Assessment	ASSESSMENT OF THEORY COURSE		
	a. Internal Examinations and Mid-Semester Examination CO1 & CO2 – Internal Exam I CO1,CO2 & CO3 – Mid semester CO4 & CO5 - Internal Exam II	20	80%
	b. Any 4 internal components	20	
	Total Marks	40	
	ASSESSMENT OF LAB COURSE		
	CO1 to CO5 is assessed through each experiment in laboratory.	5	
	Model Examination	25	
	Total Marks	25	
	End Semester Examinations	50	
	Indirect Assessment	Course Exit Survey		5	20%

PRACTICAL COURSES			
METHOD	ASSESSMENT TOOLS	MARKS	WEIGHTAGE
DIRECT	a. CO1to CO5 is assessed through Continuous Internal Assessment of each experiment.	25	80%
	b. Model Exam	25	
	c. End Semester Exam	50	
	Total Marks	100	
INDIRECT	Course Exit Survey	5	20%

MINI PROJECT			
METHOD	ASSESSMENT TOOLS	MARKS	WEIGHTAGE
Direct Assessment	a.CO1, CO2 & CO3 is assessed through Continuous Internal Assessment from Review I, Review II & Review III based on Rubrics.	50	80%
	b.End Semester Exam	50	
Indirect Assessment	Course Exit Survey	5	20%

PROJECT			
METHOD	ASSESSMENT TOOLS	MARKS	WEIGHTAGE
Direct Assessment	a.CO1, CO2 & CO3 is assessed through Continuous Internal Assessment from Review I, Review II & Review III based on Rubrics.	100	80%
	b.End Semester Exam	100	
Indirect Assessment	Course Exit Survey	5	20%

Attainment Levels:

Course outcomes of all courses are assessed with the help of above mentioned assessment tools and attainment level is evaluated based on set attainment rubrics. The target (or set) attainment level should be fixed by the Course coordinator based on the previous year results and quality of current batch of students.

If 80% and more students scored above set attainment level then the Course attainment level is 3. If 70 to 79 % of students scored above set attainment level, then the Course attainment level is 2.

If less than 60 % of students scored above set attainment level, then the Course attainment level is 1.

If the average attainment of a particular course in the previous two consecutive years is greater than 80% of the maximum attainment value (i.e. 80% of 3 = 2.4), then for that particular course the current rubrics for attainment must be changed to analyze continuous improvement.

8. 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 analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes.

BLOOM'S TAXONOMY		
Domains	Keywords	Example
Remembering: Recall or retrieve previous learned information.	defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states	Recite a policy. Quote prices from memory to a customer. Recite the safety rules.
Understanding: Comprehending the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.	comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, gives an example, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates	Rewrite the Principles of test writing. Explain in one's own words the steps for performing a complex task. Translate an equation into a computer spreadsheet.
Applying: Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the workplace.	applies, changes, computes, Constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses	Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test.
Analyzing: Separates material or concepts into component parts so that its organizational structure may be	analyzes, breaks down, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes,	Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers

understood.Distinguishes between facts and inferences.	identifies,illustrates,infers,outlines, relates,selects, separates	information from a department and selects the required tasks for training.
Evaluating: Make judgments about the value of ideas or materials.	appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, justifies, relates, summarizes, supports	Select the most Effective solution. Hire the most qualified candidate. Explainand justify a new budget.
Creating: Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	categorizes,combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells,writes	Write a company Operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Revises and process to improve the outcome.

Bloom's Taxonomy

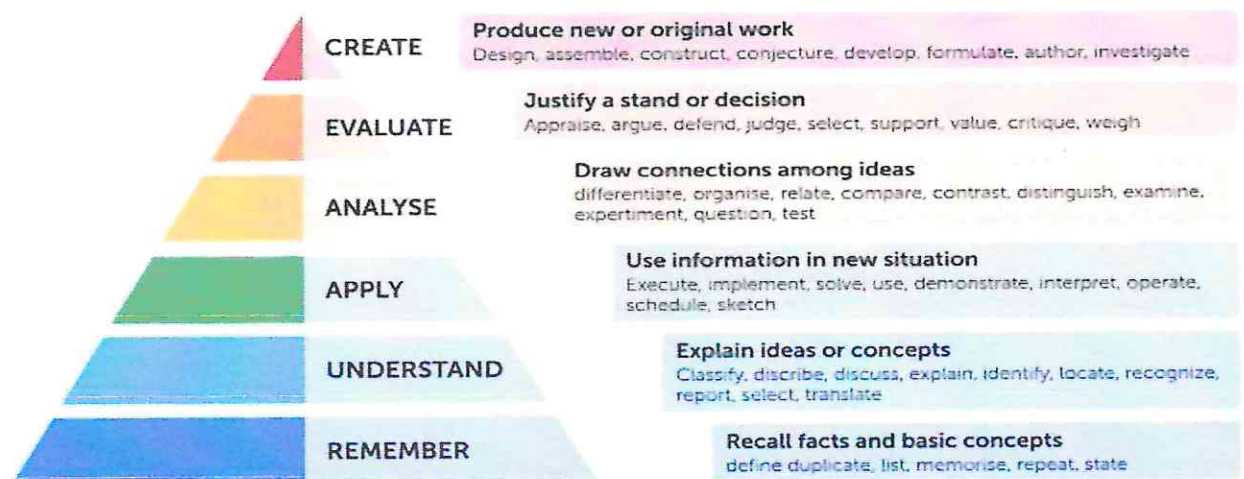


Figure 2: BLOOM'S TAXONOMY

9. PROGRAM OUTCOME (PO) ATTAINMENT

At the end of the each program, the PO attainment is done from the CO attainment of all curriculum components. As per NBA guidelines, program can appropriately define the attainment level. The attainment level may be set by the particular program or commonly by the institution. The attainment can be made as best the choice by the institution or the program by analyzing the student's knowledge. This can be achieved by using different supporting activities. This attainment is mainly for the purpose of creating a graduate with good analytical, practical and theoretical knowledge about the program by attaining the PO's of the program and the institution. For the evaluation and attainment of PO's, assessment tools are used.

The figure4 depicts the assessment tools used for the evaluation of program outcomes.

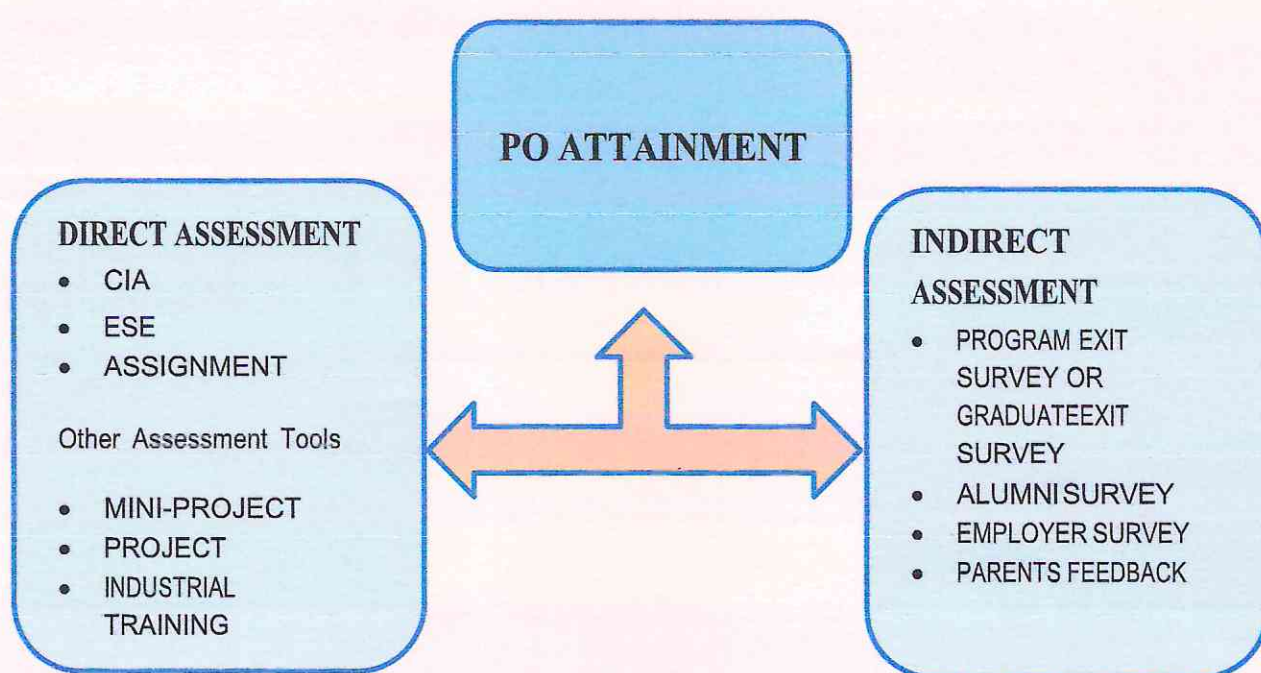


Figure 4 : Assessment Tools for Evaluation of Program Outcomes

The Program Outcome (PO) attainment and are evaluated by direct method with 80% weightage and indirect method with 20% weightage. The Direct attainment level of Particular PO is determined by taking average of all course outcomes mapping that program Outcome. Indirect attainment level of PO is determined based on Surveys and Co-curricular activities. Out of 100%, 30% weightage is given to co-curricular activities and 70% weightage to Surveys. This 100% weightage is converted to 20 % scale for PO attainment calculation. The various Surveys taken are Student exit survey, Employer survey, Alumni survey and Parents feedback. The co-curricular activities are Value added Courses,

Workshops etc related to the unattained POs(less mapped POs in CO-PO matrix). The PO Attainment Level is fixed as Maximum level of 3 & Minimum level of 1.

Course – end Survey:

The course –end survey is based on the feedback taken from the students after studying each course.

Graduate Exit survey:

The graduate exit survey is based on the feedback collected from graduates at the end of the program.

Alumni Feedback

This feedback is about how effectively they can able to implement their knowledge acquired through MCA Programme in their workplace.

Employer Feedback:

This feedback is about how alumni of department can able to implement their knowledge in the company.

Parent's Feedback :

This feedback is collected from the parents about their satisfaction in the knowledge ,skill and employment level of their wards.

Co-curricular activities:

- Workshops
- Placement training programs
- Value added courses in Modern trends

Table:

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	X	3.00	3.00	3.00	2.40	2.80	2.40	2.75	2.67	2.00	2.00	1.33	2.25
2	Y	...	...	...	...	...	...	...	...	...	...	...	...
3	Z	...	...	...	...	...	...	...	...	...	...	...	...
4	M	...	...	...	...	...	...	...	...	...	...	...	...
5	N	...	...	...	...	...	...	...	...	...	...	...	...
6	O	...	...	...	...	...	...	...	...	...	...	...	...

Average (Achievable for 100% from Course Articulation Matrix)	...	...	...	...	...	...	...	...
Reduced Average (Achievable for 50% from Course Articulation Matrix)	...	...	...	...	...	...	...	...
Average of Placement / HS / E (25%)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Average of Graduate Exit Survey (10%)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Average of Employer Survey (5%)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total Achievable for 100%)	1.47	1.58	2.11	2.33	2.03	2.43	2.43	2.58

Where '0' is No Correlation, '1' is Slight Correlation, '2' is Moderate Correlation and '3' is Substantial Correlation.

The achievable POs can be arrived from the Program Articulation Matrix. From the achievable the POs, the target to be achieved is fixed as below.

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Achievable (Outcome from Program Articulation Matrix)	1.457	1.58	2.11	2.33	2.58	1.46	1.87	1.93	1.68	2.09	2.01	1.45
Target to be Achieved (80%)	1.176	1.264	1.688	1.864	1.764	1.524	1.844	1.945	1.754	2.054	2.032	1.545

10. PROGRAM EDUCATIONAL OBJECTIVE (PEO) ATTAINMENT

Attainment of the program educational objectives (PEOs) is done by indirect measurements. Placement record, higher studies and survey forms like alumni survey and employer survey are used to assess the attainment of PEOs. The PEOs are formally reviewed by the Department advisory committee every year. As described above, we solicit feedback from alumni and their employer through formal and informal mechanisms.

The assessment of Programme Educational Objectives (PEOs) involves the use of various tools and processes to gather data, measure outcomes, and evaluate the effectiveness of the programme. A systematic process is established for distributing surveys to alumni, employers, and industry stakeholders. This methodically collects feedback on the relevance of the MCA programme, graduates performance, and the achievement of PEOs.

Assessment Metrics: The programmes assessment metrics are systematically defined in alignment with each Programme Educational Objective (PEO). This involves a structured process to ensure specificity and measurability, facilitating an objective evaluation of the programmes overall effectiveness.

Data Collection: Data collection is a well-defined process that involves gathering information from various sources. Alumni feedback is systematically obtained through surveys, capturing insights on career progression and the relevance of their education. Employer perspectives are systematically sought to evaluate the programmes alignment with industry expectations. Additionally, POs, student performance data with respect to the present employment, higher studies and entrepreneurship ventures, are meticulously collected through established processes.

Classroom Assessment: Implementing various classroom assessments, including quizzes and peer evaluations, is part of a systematic process to gauge students understanding of key concepts, problem-solving abilities, and practical skills. It accounts for COs and POs.

Assessment of Projects: Evaluating the quality and alignment of capstone projects or theses with POs is conducted through a structured process using rubrics and assessment frameworks. This systematic approach ensures a thorough assessment of specific learning outcomes and competencies. Standardized

Assessments: Administering standardized exams or assessments is conducted through a systematic process using standardized test materials and grading rubrics. This process evaluates specific learning outcomes and competencies associated with the PEOs.

Assessment of POs: Evaluating the POs is conducted through a structured process using rubrics and assessment frameworks. This systematic approach ensures a thorough assessment of specific learning outcomes and competencies.

Graduate Tracking Systems: Establishing and utilizing database systems and alumni tracking, a systematic process is in place to track the career progression and employment status of programme graduates. This provides ongoing data on graduates' relevance in their fields and advancements in their careers like employment, higher education and entrepreneurship.

Alumni Surveys: Feedback from alumni is systematically gathered through surveys, employing survey platforms and questionnaires. This defined process assesses how well graduates are satisfied and possessing the skills and knowledge outlined in the PEOs.

Employer Surveys: Feedback from employers is systematically gathered through surveys, employing survey platforms and questionnaires. This defined process assesses how well graduates are meeting industry expectations and possessing the skills and knowledge outlined in the PEOs.

Industry Recognition and Awards Monitoring Process: The monitoring of industry recognition and awards follows a systematic process. This includes continuous tracking of accolades received by graduates or the programme itself, serving as indicators of the programmes impact on the industry and the success of its graduates.

Continuous Improvement Surveys Implementation Process: The implementation of surveys and feedback mechanisms for stakeholders is a defined process. This involves systematically gathering feedback from current students, faculty, and industry stakeholders to identify areas for improvement. The structured feedback loop informs decisions for enhancing the programmes effectiveness.

Assessment of Learning Outcomes Process: The assessment of specific learning outcomes associated with each PEO is a systematic process. This includes the structured review of student performance on standardized exams, projects, and other assessments demonstrating the acquisition of knowledge and skills.

Programme Data Review Process: Regular reviews of programme-level data, such as graduation rates and student performance, are conducted through a structured process. This involves the systematic analysis of trends and patterns that may impact the achievement of PEOs.

Benchmarking Against Accreditation Standards Process: Benchmarking against accreditation standards is a defined process ensuring alignment with industry and educational benchmarks. This systematic approach upholds the quality and relevance of the programme.

Documentation and Reporting Procedure: The documentation and reporting of assessment findings follow a well-defined procedure. This includes the systematic preparation of comprehensive reports summarizing the achievement of PEOs, with clear communication to stakeholders.

Feedback Loop and Continuous Improvement Integration Process: The establishment of a feedback loop for continuous improvement is part of a systematic process. Assessment findings systematically inform decisions to make informed adjustments to the curriculum, teaching methodologies, and other aspects of the programme.

Frequency of Assessment Process: The frequency of assessing Program Educational Objectives (PEOs) in the MCA programme is an important aspect of ensuring continuous improvement and accountability. The specific frequency of assessment is mentioned in the Table 1.4.1. The POs are assessed at the completion of the programme. Whereas the other components such as Placements, Higher Education, Entrepreneurship, Graduate Feedback and Employer Feedback are assessed at the end of TWO years of the graduation.

Table 9.1. PEO Assessment Types, Tools, Criteria, Frequency and Weightage

Type of Assessment	Assessment Tool	Assessment Criteria	Frequency of Assessment	Weight age	Targeted PEOs
Direct	Programme Outcomes	Each COs, Individual POs, Exit Survey	On Completion of the Programme	50 %	1, 2, 3
Direct	Placement Record	Number of Students Employed	At the end of Two Years of Graduation	20 %	1, 2, 3
Direct	Higher Studies	Number of Students have enrolled for Higher Studies	At the end of Two Years of Graduation	5 %	1, 2, 3
Direct	Entrepreneurship	Number of Students involved in Entrepreneurship	At the end of Two Years of Graduation	5 %	1, 2, 3
Indirect	Alumni Feedback	Level of Achievement / Satisfaction	At the end of Two Years of Graduation	10 %	1, 2, 3


PRINCIPAL