

EVALUATION OF COs, POs, PSOs

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1.1 State the Vision and Mission of the Department and Institute

1.1 State the Vision and Mission of the Department and Institute (5)

(Vision statement typically indicates aspirations and Mission statement states the broad approach to achieve aspirations)

(Here Institute Vision and Mission statements have been asked to ensure consistency with the department Vision and Mission statements; the assessment of the Institute Vision and Mission will be taken up in Criterion 10)

Availability (1) + Appropriateness (2) + Consistency (2)

1.2. State the Program Educational Objectives (PEOs)

1.2. State the Program Educational Objectives (PEOs) (5)

(State the PEOs (3 to 5) of program seeking accreditation)

- ❖ **Program Education Objectives (PEO):**Preparing the graduates to attain career and professional accomplishments within a few year(3-5years)of graduation.
- Indicative: (Five
 - Preparation (Employment/Higher studies)
 - Core competence(Discipline knowledge)
 - Breadth (Skills, Research)
 - Professionalism (training/ III)
 - Life long learning(Environment)

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

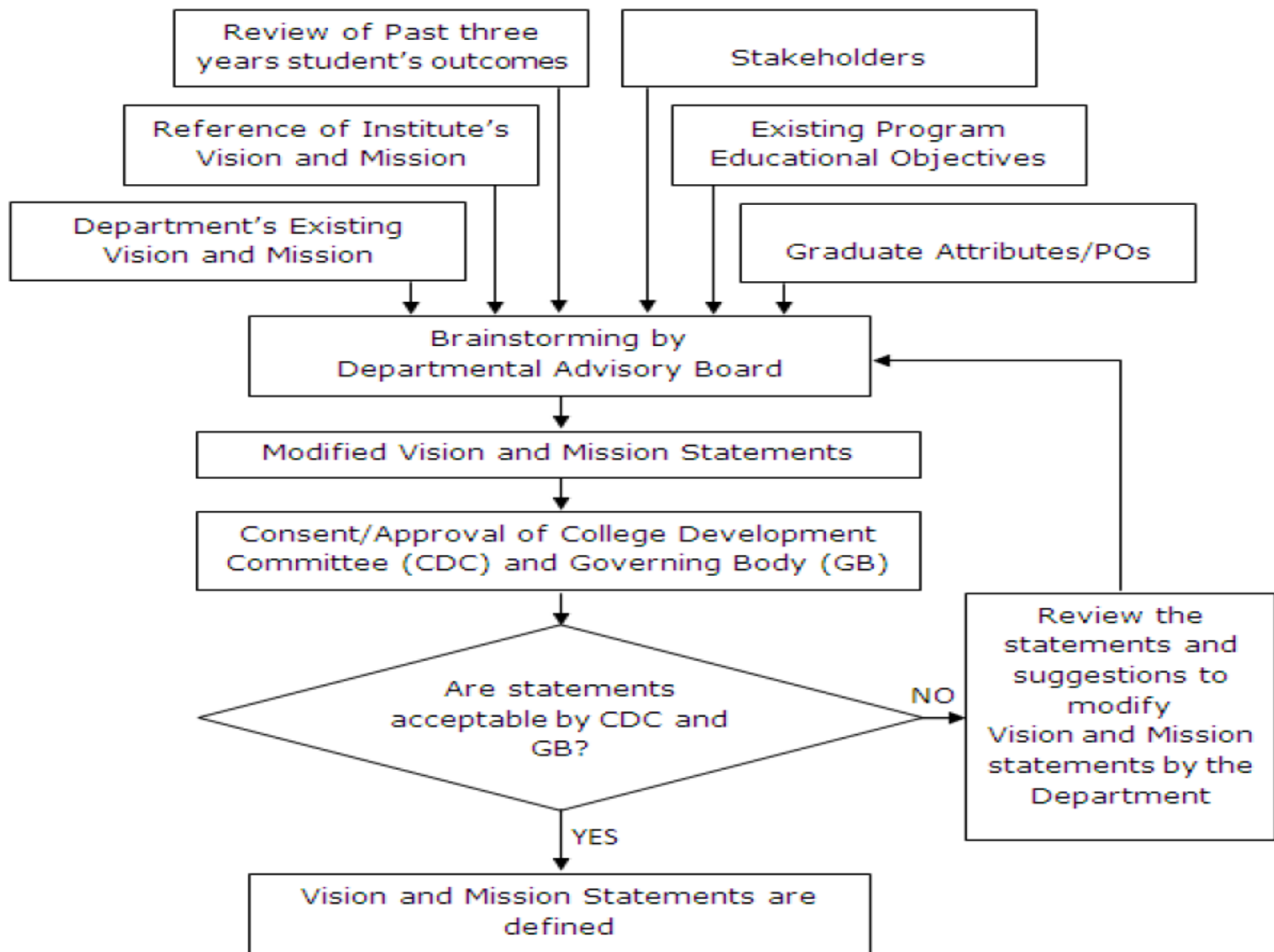


Figure B 1.4.1: Process for defining Vision and Mission of the Department

1.5. Establish consistency of PEOs with Mission of the Department

1.5. Establish consistency of PEOs with Mission of the Department (15)

(Generate a “Mission of the Department – PEOs matrix” with justification and rationale of the mapping)

Note: M1, M2,... Mn are distinct elements of Mission statement. Enter correlation levels 1, 2 or 3 as defined below: 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-”

Matrix Preparation (5) + Consistency / Justification (10)

Mapping and Justification

Mission	PEO1	PEO2	PEO3
To create the environment for innovative and smart ideas for generation of professionals to serve the nation and world with latest technologies in Civil Engineering.	Work for the development of Infrastructure for Govt. /Private sector	Contribute to the research and development of civil engineering	
To develop intellectual professionals with skill for work in industry, academia and public sector organizations and entrepreneur with their technical capabilities to succeed in their fields	Work for the development of Infrastructure for Govt. /Private sector	Pursue higher studies so that can contribute to the teaching profession	Function effectively in the multicultural and multidisciplinary groups for the civil engineering projects and profession
To build up competitiveness, leadership, moral, ethical and managerial skill.	Work for the development of Infrastructure for Govt. /Private sector		Function effectively in the multicultural and multidisciplinary groups for the civil engineering projects and profession

NBA CRITERION II

**Program Curriculum and
Teaching - Learning Processes
(120 /1000)**

2.1 Program Curriculum

2.1.1 State the process used to identify extent of compliance of the University curriculum for attaining the Program Outcomes and Program Specific Outcomes . Also mention the identified curricular gaps, if any (10)

Effective Process Implementation (6) + Curricular Gaps (4)

2.1.2 State the delivery details of the content beyond the syllabus for the attainment of POs and PSOs (10)

Intimation to the University (2) +Delivery details (5)+Mapping(3)

- (State the process details; also mention identified curricular gaps).
- Note: In case all POs are being demonstrably met through University Curriculum then 2.1.2 will not be applicable and the weightage of 2.1.1 will be 20.

2.1 Program Curriculum

Example:

- ABC Institute is affiliated to the XYZ University (Tier 2).
- The institute follows the scheme and syllabus prescribed by program curriculum of affiliated University.
- The UG program in Engineering is spread over 8 semesters which includes subjects like basic sciences, engineering sciences, mathematics, soft skills, core subjects, electives, seminars and projects.
- The total number of credits for B.E. program is 160 for example.

2.1 Program Curriculum

Program Outcomes (POs) : 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 behaviors that students acquire as they progress through the program.

1. Engineering Knowledge

2. Problem Analysis

3. Design & Development of Solutions

4. Conduct investigations of complex problems

5. Modern Tools Usage

6. The engineer and society

7. Environment & Sustainability

8. Ethics

9. Individual & Team work

10. Communication

11. Project management & Finance

12. Lifelong Learning

2.1 Program Curriculum

- **Program Specific Outcomes (PSOs):** Statements that describe what the graduates of a specific engineering program should be able to do.

PSOs	Statement
PSO1	Ability to analyze, design and develop solutions to challenges relevant to Electronics & Telecommunication Engineering.
PSO2	Act effectively to tackle societal and environmental issues by using professional ethics.
PSO3	Adaptability to upgrade to the latest trends and acceptance to advancement of the relevant technologies.

2.1 Program Curriculum

Eg.2 PSOs of Mechanical Engg

The graduates of the department will attain:

- PSO1 Design: The ability to provide designs for solving the real-life problems in the field of Mechanical Engineering.
- PSO2 Modeling & Analysis: The ability to develop models for the Mechanical systems/processes using CAE tools and analyze them.
- PSO3 Society: To strengthen Mechanical Engineering graduates who would value professional and ethical responsibilities while solving the societal problems.

2.1 Program Curriculum

Curriculum- Tier 2-Tasks

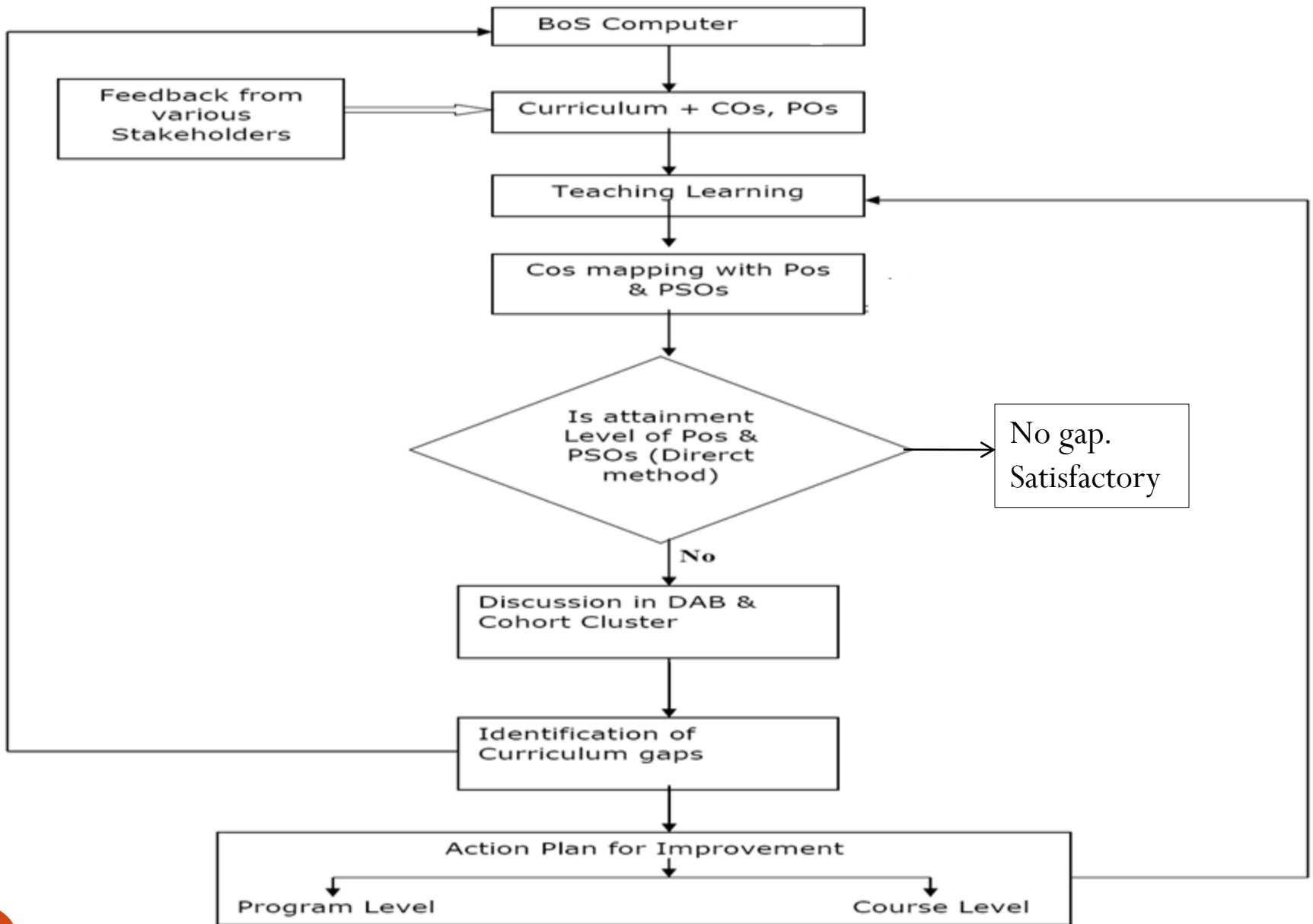
- Analyze the University Curriculum
- Determine the Gaps in Attainment of POs
- Design Extra modules or Assessments to Bridge these gaps
- Could need a few iterations for their impact on attainment and hence quality of outcomes

2.1 Program Curriculum

- The courses in the curriculum are defined into the following course components:
 1. Basic Science Courses (BSC)
 2. Engineering Science Courses (ESC)
 3. Humanities and Social Sciences including Management courses(HSSMC)
 4. Professional core courses (PCC)
 5. Professional Elective courses (PEC)
 6. Open Elective courses (OEC)
 7. Project and Seminars (PS)

- Mapping of Curriculum with POs and PSOs

Sr No	Course Component	Code	Course	Semester	Credit	Mapping with POs	Mapping with PSOs
1	BSC	107001	Engineering Mathematics I	1	5	1,2,3	1,3
2		107008	Engineering Mathematics II	2	4	1,2,3	1,3
3		107002	Engineering Physics	2	5	1,2,6	1,3
4		107009	Engineering Chemistry	1	5	1,2,3,6,7	1,3
5		207002	Engineering Mathematics III	3	5	1,2,3,4,5,7 ,8,9,10,12	2,3



2.1 Program Curriculum

Curricular gap for the attainment of defined POs & PSOs

- Horizontal and Vertical gaps

Sr No	Gap Number	Gap
1	Gap 1	Inadequate Industry Exposure
2	Gap 2	Keeping Pace with Technological Advancement
3	Gap 3	Necessity of Professional Engineering Practice and Value Added Courses

2.1 Program Curriculum

- **Delivery details for content beyond syllabus**

To bridge the identified gaps, various activities in the department are regularly conducted such as

- Industrial Visits
- Internship Programs
- Value addition courses
- Workshops / seminars
- Guest Lectures

2.1 Program Curriculum

- Delivery details for content beyond syllabus
- **Inputs given to Affiliated University regarding addition of new course in the curriculum:**
 - In order to bridge the GAP 3 Keeping Pace with Technological Advancement, the department has proposed a new course under the open elective category to the BOS, Civil Engineering, XYZ univ.
 - The course 'Modification of Concrete Structures' has been designed with Industry expert, Mumbai. The BOS, Civil Engineering has approved this Open Elective.

2.1 Program Curriculum

Table 4 Delivery details and mapping of content beyond syllabus (Civil and ECE)

Sr No	Gap	Action Taken	Date-Month & Year	Resource Person with Designation	% of Students	Relevance to POs and PSOs
1	Gap 1 Inadequate field exposure	Site Visit of TE students for subject: Structural Design-I	20/08/2018	M/s. Omkar Engineering Pvt. Ltd, Pune	95	POs:1,5,6,8,9, 10,11, 12
						PSOs: 1, 3

8	Gap 2 Keeping Pace with Technological Advancement	Guest lecture on ASIC Design flow	24/08/2018	Rajeev Chopra, L &T, Mumbai	90	POs: 2,3,5
						PSOs:1,3

2.1 Program Curriculum

Curricular gaps - *Add on Courses* for compliance of PO

Relevance to POs	Curricular Gap identified	Courses/ Areas	Duration
PO12, PO1, PO2	Necessary for higher studies and communicated to BOS (14-10-2014) & conducted a course	Control System (Course not in curriculum)	Inclusion in Third Year Syllabus (wef. 2015-2016)
PO7, PO12, PO1, PO4, PO5, PO8, PO10	Industry Exposure	PLC & SCADA	1 Month
PO12, PO8, PO9, PO10	Ethics, Communication, Individual & Team work	General Aptitude & Soft Skill	3 Months
PO3, PO6, PO11, PO1, PO2	Design/Development of solutions	Hands on for product development	2days

2.2. Teaching - Learning Processes

Sr. No.	Sub Points	Marks
1	Describe Processes followed to improve quality of Teaching & Learning	25
2	Quality of Internal Semester Question Papers, Assignments and Evaluation	20
3	Quality of student projects	25
4	Initiative related to industry interaction	15
5	Initiatives related to Industry internship /summer Training	15
	Total	100

2.2. Teaching - Learning Processes

- 2.2.1. Describe Processes followed to improve quality of Teaching & Learning (25)
- Academic Calendar (3)+Pedagogical initiatives (3)+Weak and Bright students (4)+ Classroom teaching (3) + Experiment (3) + Continuous Assessment in Lab(3)+ Student feedback of T-L and action taken there of (6)
- Documentary evidence

2.2. Teaching - Learning Processes

- Describe Processes followed to improve quality of Teaching & Learning
- Use of various instructional methods and pedagogical initiatives

M-1	Lecture intersperse with discussion
M-2	Lecture with quiz
M-3	Tutorial
M-4	Demonstration (Model/Laboratory)
M-5	Group discussion
M-6	Group Assignment
M-7	Project
M-8	Individual/Group brainstorming
M-9	Role-play
M-10	Learning resource sharing

2.2. Teaching - Learning Processes

- Describe Processes followed to improve quality of Teaching & Learning
- **Quality of classroom teaching (Observation in a Class)**
 - Conventional classroom teaching is supported with ICT tools, PPT, display of models, video animation etc.
 - Efforts are made to make session interactive to ensure active involvement of students.
 - Quiz, group discussions, presentation by the students, innovative activities are conducted to ensure involvement of students and also improve quality of teaching learning process.

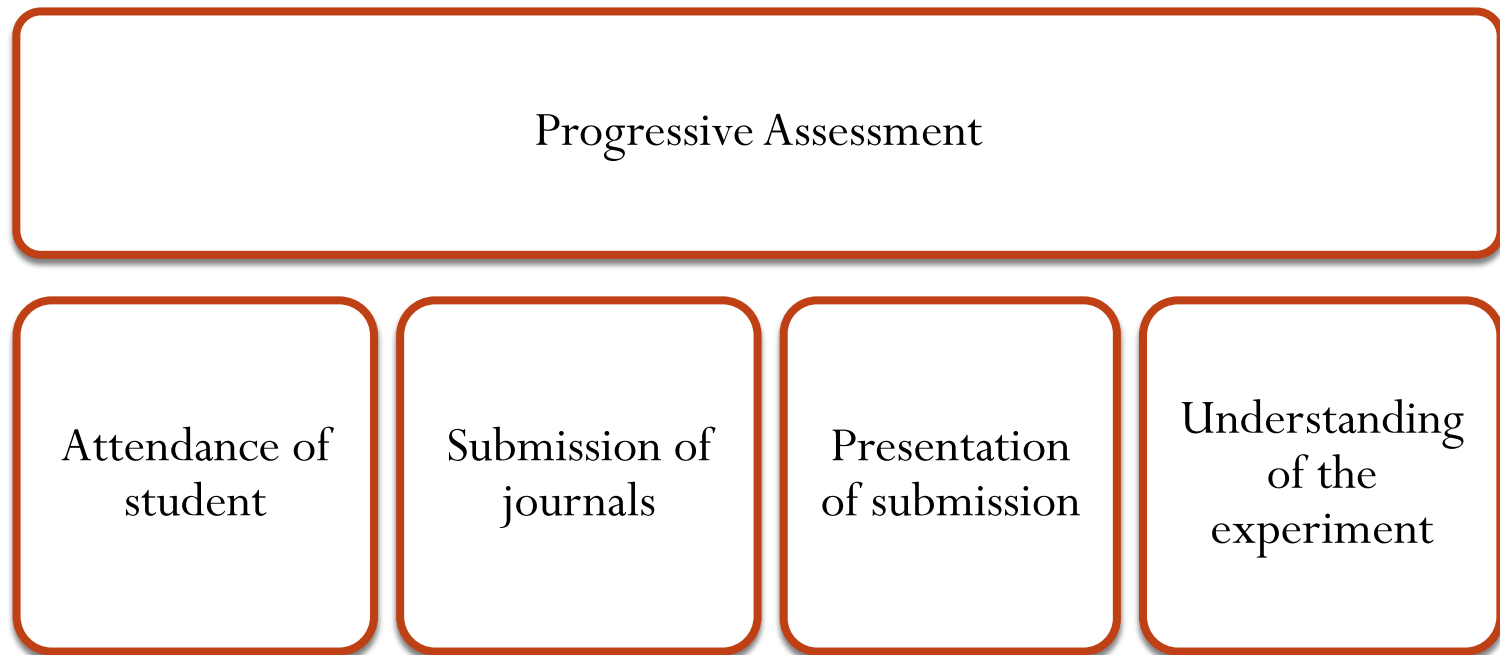
2.2. Teaching - Learning Processes

- Describe Processes followed to improve quality of Teaching & Learning
- **Conduction of experiments**
 - Hands-on learning experience
 - User friendly laboratory manuals
 - Assistance is made available by technical supporting staff
 - Students submit the experimental write-up after the completion of experiments with result analysis and conclusion
 - Oral questions are asked to students to assess their understanding and concepts of individual experiment
 - Add-on experiments are conducted to bridge the identified gap and attainment of COs

2.2. Teaching - Learning Processes

- Describe Processes followed to improve quality of Teaching & Learning

Continuous Assessment for laboratory Work



2.2. Teaching - Learning Processes

- Describe Processes followed to improve quality of Teaching & Learning

Students' feedback

- Feedback from the students is collected through designed questionnaire for the evaluation of course delivery.
- Analysis of the feedback received from the students is done for each faculty.
- Report of the same is prepared.
- Strengths and weakness in the feedback shared with the concerned faculty individually in the presence of Principal, Dean Academics and Head of Department (Program coordinator).
- The faculty, course coordinator and program coordinator have to take corrective measures and keep record.
- There should be min. 2 feedbacks per semester for timely actions to be taken.

2.2. Teaching - Learning Processes

- Describe Processes followed to improve quality of Teaching & Learning

Students' feedback Action Taken:

- Training / orientation programs are conducted by professional experts to master the skills of the faculty members
- Appreciation letter are issued for good performance
- Faculty members who get average feedback are identified and deputed for orientation lectures, Faculty Development Program and Short Term Training Program.

2.2. Teaching - Learning Processes

2.2.2. Quality of internal semester Question papers, Assignments and Evaluation (20)

Process to ensure quality (5) + Process to ensure quality of question paper from outcomes/ learning perspective (5) + Evidence of COs coverage (5) + Quality of assignments and relevance to COs (5)

- Documentary evidences

2.2. Teaching - Learning Processes

- **Quality of Internal Semester Question Papers, Assignments and Evaluation**

Internal Semester Question Papers

- Internal examination schedule is provided in the academic calendar.
- Departmental Class test coordinator prepares class test and prelim time table and invigilation duty slot for smooth conduction of examination.
- Question Paper setting by considering level of blooms taxonomy and map the questions with COs and PSOs.
- The question paper set by the course teacher is discussed in Cohort cluster to ensure quality of question paper.
- A sample question paper is to be kept as the documentary evidence.

2.2. Teaching - Learning Processes

Sample question paper

Class Test – I						
Class – SE				Academic Year – 2018-19		
Subject- Digital Electronics and Logic Design				Term – I		
Duration – 1:00 Hr.				Marks – 30 Marks		
Instructions-						
1) Neat diagrams must be drawn wherever necessary.						
2) Assume suitable data, if necessary.						
3) All questions are compulsory						
Q. No.		Questions	Marks	COs Mapping	PO Mapping	Level of learning
Q.1	(A)	Describe the block diagram of PLA and explain each block in brief	5	CO2	2	2
	(B)	Implement binary to gray code converter using PAL.	5	CO2	1,2	3
	(C)	Implement BCD to Excess-3 code converter using ROM	5	CO2	1,2	3
Q.2	(A)	Distinguish TTL and CMOS logic families Characteristics	5	CO2	1, 4	4
	(B)	Explain TTL and CMOS interfacing	5	CO3	1, 4	2
	(C)	Sketch the block diagram of architecture of microcontroller 8051	5	CO4	1, 2	3

2.2. Teaching - Learning Processes

2.2.2 Quality of Internal Semester Question Papers, Assignments and Evaluation Assignments

- Assignments are prepared on all units of course by course teacher.
- Assignments along with key solutions are included in the Course files.
- Assignment questions are prepared by considering all level of Blooms taxonomy applicable to respective course and map with COs and PSOs.
- Assignments are based on library work, Industry applicable problems & Independent research.
- A sample assignment is to be provided.

2.2. Teaching - Learning Processes

Assignment					
Class – SE			Academic Year- 2018-19		
Subject- Digital Electronics Laboratory			Term – I		
Q. No.	Questions	Marks	COs Mapping	PO Mapping	Level of learning
Q. 1	Implement Code Converters-Binary to Gray and BCD to Excess-3	4	CO1 CO2	2	3
Q.2	a. Realization of 3 bit Up/Down Counter using MS JK Flip Flop / D Flip Flop b. Realization of Mod -N counter using (7490 and 74193)	7	CO2	2,3	2
Q.3	simulation of - Full adder , Flip flop, MUX using VHDL (Any 2) Use different modeling styles	5	CO3	4,5	4
Q.4	Explain 8051 : Features, Architecture and Programming Model	4	CO4	4	3

2.2. Teaching - Learning Processes

- Quality of student projects
 - Projects Identification and allocation : (As per guideline of XYZ univ.)
 - Implementation: (A Project Review Committee)
 - Initiatives:
 1. Experimental investigation
 2. Software simulation
 3. Cost economy analysis
 4. Case study with own design development
 5. Working model design and fabrication
 6. Case study with development of methodology using soft computing tools

2.2. Teaching - Learning Processes

- Quality of student projects
 - Allocation Procedure of Project Guide and Topic
 - Types and relevance of the projects and their contribution towards attainment of POs and PSOs
 - Process for monitoring and evaluation
 - XYZ Univ. Guidelines for evaluation of project work
 - Process to assess individual and team performance
 - Quality of completed projects/working prototypes
 - Papers published / Awards received by Projects

2.2. Teaching - Learning Processes

- Quality of student projects
 - Identification of projects
 1. Structural Engineering and Concrete Technology
 2. Engineering Geology, Geotechnical Engineering and Foundation Engineering
 3. Construction Management
 4. Transportation Engineering
 5. Environmental Engineering
 6. Water Resource Engineering

2.2. Teaching - Learning Processes

Rubrics for Project evaluation : Weekly meetings with respective guide on the project day as allotted in the timetable and Departmental Project Committee evaluates student group periodically

Review	Agenda	Assessment	Weightage	Overall weightage
Review 1	Project Synopsis/ Proposal Evaluation	Rubric R1	18 (9%)	120 (60%)
Review 2	Mid Term Project Evaluation	Rubric R2	18 (9%)	
Review 3	End Semester Project Evaluation	Rubric R3	30(15%)	
Review 4	Project Report Evaluation	Rubric R4	30(15%)	
Review 5	Evaluation by Guide	Rubric R5	24(12%)	
External Evaluation			80 (40%)	80 (40%)

Supporting Documents

- Curriculum File
- Feed back from Stake holders for GAP Analysis
- DAB Minutes of Meetings
- Workshops/ Seminars/ Guest Lectures
- Site Visit/ Study Tour
- Academic Calendar
- Time Table
- Class Test
- Laboratory Documents (Lab Manual. Log Tables, Progressive Assesments etc.)
- Final Year Project File
- Internship Program File
- MOUs
- Course File
- Teacher Guardian

NBA

CRITERION III

3. COURSE OUTCOMES AND PROGRAM OUTCOMES

(120 /1000)

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

3.1.1. Course Outcomes (COs)

(SAR should include course outcomes of one course from each semester of study, however, should be prepared for all courses and made available as evidence, if asked) (05)

Note: Number of Outcomes for a Course is expected to be around 6.

Course Name: Ciii Year of Study: YYYY – YY; for ex. C202 Year of study 2013-14

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

Definitions

- **Course Outcomes (CO):** Student is expected to know and be able to do at the end of each course (Narrower Statements).
- **Program Specific Outcomes (PSO):** What the graduates of a specific UG Program should be able to do at the time of graduation.
- **Program outcomes (PO):** What the graduates of a UG Program should be able to do at the time of graduation.
- **Program Education Objectives (PEO):** Preparing the graduates to attain career and professional accomplishments within a few year (3-5 years) of graduation.

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

- **Course Outcomes (COs):** Statements indicating what a student can do after the successful completion of a course.
- The CO statements are defined 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.

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

- Course: ELECTRONIC DEVICES AND CIRCUITS (1804PC01)
- Course Code: 1804PC01
- Table: Sample CO statements

CO	COURSE OUTCOMES DESCRIPTION
CO1	Understand and Analyse the different types of diodes, operation and its characteristics
CO2	Design and analyse the DC bias circuitry of BJT and FET
CO3	Design biasing circuits using diodes and transistors
CO4	To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

3.1.2. CO-PO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per semester from 3rd to 8th semester) (05)

Note: 1. Enter correlation levels 1, 2 or 3 as defined below: 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-” 2.

Similar table is to be prepared for PSOs

CO/PO	1	2	3	4	5	6	7	8	9	10	11	12
CO101												
.....												
.....												

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

3.1.2. CO-PO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per semester from 3rd to 8th semester) (05)

Class	Course Name	PO	1	2	3	4	5	6	7	8	9	10	11	12
		CO												
SE	Digital Electronics	C205.1	2	2	2	2	1	2	1	-	1	1	-	2
		C205.2	2	2	2	2	2	2	2	2	1	-	1	2
		C205.3	1	2	2	2	2	2	1	1	1	-	1	2
		C205.4	1	2	2	2	2	2	2	1	-	1	2	2

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

3.1.2. CO-PSO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per semester from 3rd to 8th semester) (05)

Class	Course Name	CO	PSO 1	PSO 2	PSO 3
SE	Digital Electronics	C205.1	3	-	-
		C205.2	3	-	-
		C205.3	3	-	1
		C205.4	3	1	1

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

3.1.3. Program level Course-PO matrix of all courses INCLUDING first year courses (10)

Year	Course	1	2	3	4	5	6	7	8	9	10	11	12
First Year	C101	3.00	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C102	2.33	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
	C103	2.33	2.33	0.00	2.33	2.67	0.00	0.00	2.00	2.67	2.67	2.33	1.67
	C104	3.00	3.00	0.00	1.33	2.00	1.33	2.00	1.33	3.00	2.00	1.33	2.00
	C105	3.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
	C106	3.00	2.50	1.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
	C107	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C108	1.67	2.00	1.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
	C109	3.00	3.00	3.00	1.33	0.00	0.00	2.67	0.00	0.00	0.00	0.00	0.00
	C110	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C111	2.67	2.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00
	C112	3.00	2.00	2.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	2.00

Average values of POs	2.54	2.38	1.92	1.63	1.75	1.42	1.29	1.23	1.53	1.45	1.36	1.50

3.2 Attainment of Course Outcomes

3.2.1 Describe the assessment processes used to gather the data upon which the Evaluation of Course Outcome is based (10)

(Examples of data collection processes may include, but are not limited to, specific exam/tutorial questions, assignments, laboratory tests, project evaluation, student portfolios (A portfolio is a collection of artifacts that demonstrate skills, personal characteristics and accomplishments created by the student during study period), internally developed assessment exams, project presentations, oral exams etc.)

3.2 Attainment of Course Outcomes

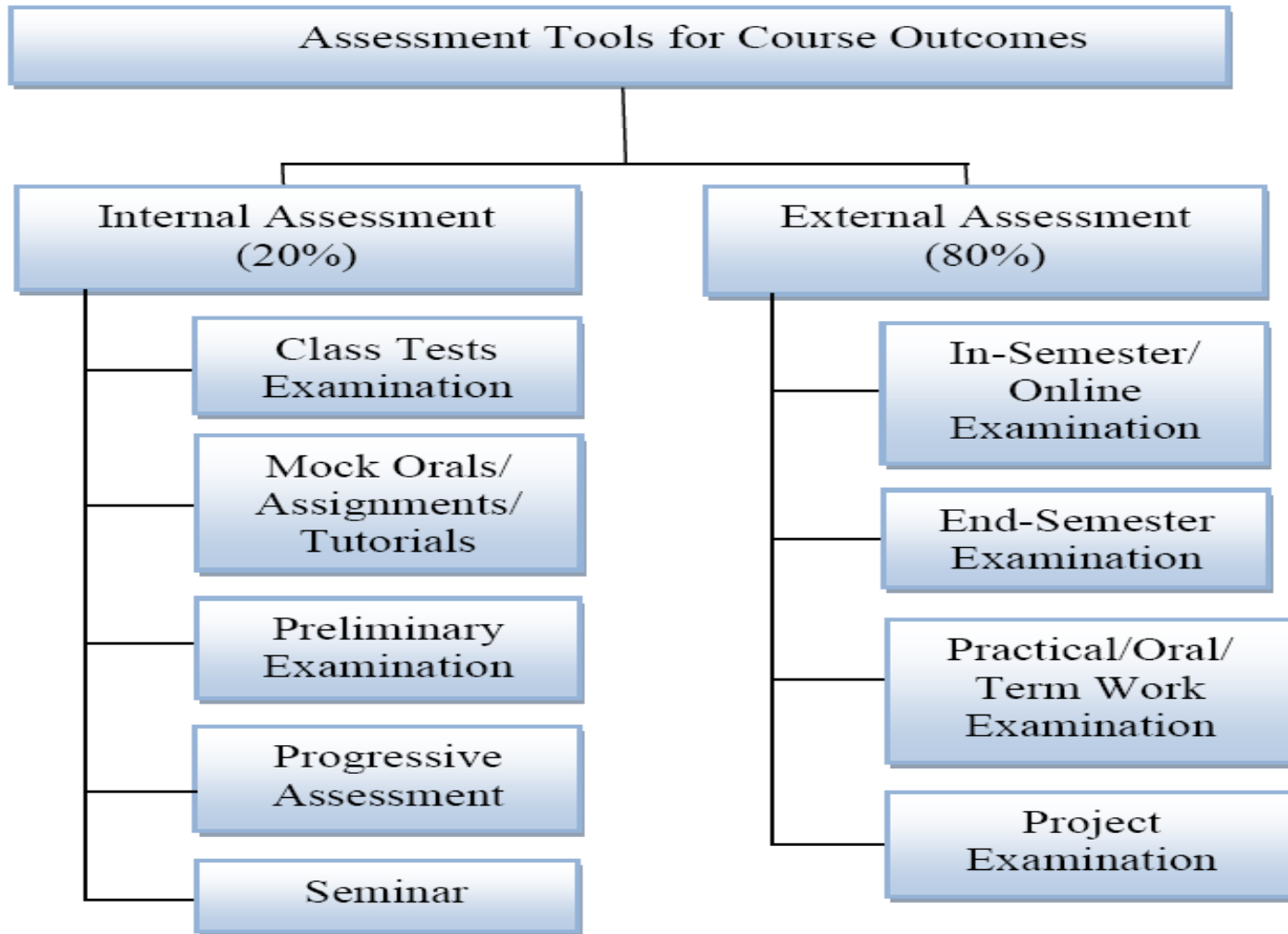


Figure 3.2.b: Assessment Tools for Course Outcomes

3.2 Attainment of Course Outcomes

3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels (40)

Program shall have set Course Outcome attainment levels for all courses.

(The attainment levels shall be set considering average performance levels in the university examination or any higher value set as target for the assessment years. Attainment level is to be measured in terms of student performance in internal assessments with respect to the Course Outcomes of a course in addition to the performance in the University examination)

3.2 Attainment of Course Outcomes

Criterion	(Assessment Tool) _i	
Range of Marks	No. of Students	Attainment in %
Marks $\geq 60\%$	X_i	$= \frac{(X_i * 3) + (Y_i * 2) + (Z_i * 1)}{\text{Total No. of Students} * 3}$
50 to 59%	Y_i	
40 to 49%	Z_i	
Marks $< 40\%$ (failed)+Absent	F	-

Table B 3.2.2a

CO_i: External Attainment Level

$$= \left(\frac{PP}{T}\right) * PP \text{ Attainment} + \left(\frac{TW}{T}\right) * TW \text{ Attainment} + \left(\frac{OE}{T}\right) * OE \text{ Attainment} + \left(\frac{OR}{T}\right) * OR \text{ Attainment}$$

Where, PP- Theory Paper, TW- Term work, OE- Online Exam, OR – Oral, T- No. of Assessment tools

3.2 Attainment of Course Outcomes

Measuring CO attainment through Internal Assessments:

Example : Mid-term test 1 addresses C202.1 and C202.2. Out of the maximum 20 marks for this test 12 marks are associated with C202.1 and 8 marks are associated with C202.2.

Attainment Level 1: 60% students scoring more than 60% marks out of the relevant maximum marks.

Attainment Level 2: 70% students scoring more than 60%

Attainment Level 3: 80% students scoring more than 60%

Attainment is measured in terms of actual percentage of students getting set percentage of marks. If targets are achieved then the C202.1 and C202.2 are attained for that year. Program is expected to set higher targets for the following years as a part of continuous improvement.

If targets are not achieved the program should put in place an action plan to attain the target in subsequent years.

3.2 Attainment of Course Outcomes

3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels (40)

Measuring CO attainment through Internal Assessments:

Target may be stated in terms of percentage of students getting more than class average marks or set by the program in each of the associated COs in the assessment instruments (midterm tests, assignments, mini projects, reports and presentations etc. as mapped with the COs)

$$CO_i \text{ Internal Attainment Level} = \frac{\text{Sum of Attainment level of all assessment tools}}{\text{No. of assessment tools}}$$

3.2 Attainment of Course Outcomes

Measuring Course Outcomes attained through University Examinations

- Attainment Level 1: 60% students scoring more than University average percentage marks or set attainment level in the final examination.
- Attainment Level 2: 70% students
- Attainment Level 3: 80% students
- Attainment is measured in terms of actual percentage of students getting set percentage of marks.
- If targets are achieved then all the COs are attained for that year.
- Program is expected to set higher targets for the following years as a part of continuous improvement.
- If targets are not achieved the program should put in place an action plan to attain the target in subsequent years. (criteria 7)

3.2 Attainment of Course Outcomes

3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels (40)

Course Outcome Attainment:

Attainment through University Examination: Substantial i.e. 3

Attainment through Internal Assessment: Moderate i.e. 2

Assuming 80% weightage to University examination and 20% weightage to Internal assessment, the attainment calculations will be (80% of University level) + (20% of Internal level) i.e.

$$80\% \text{ of } 3 + 20\% \text{ of } 2 = 2.4 + 0.4 = 2.8$$

Note: Weightage of 80% to University exams is only an example. Programs may decide weightages appropriately for University exams and internal assessment with due justification.

3.2 Attainment of Course Outcomes

Year	Course	Target Level	Attainment Level
First Year	C101	2.10	2.15
	C102	2.60	2.64
	C103	2.10	2.07
	C104	2.20	2.14
	C105	2.10	1.98
	C106	2.30	2.24
	C107	2.25	2.19
	C108	2.10	1.75
	C109	2.10	2.04
	C110	2.08	1.72
	C111	2.00	1.69
	C112	2.55	2.54

3.3. Attainment of Program Outcomes and Program Specific Outcomes

3.3.1. Describe assessment tools and processes used for measuring the attainment of each of the Program Outcomes and Program Specific Outcomes (10)

(Describe the assessment tools and processes used to gather the data upon which the evaluation of each of the PO and PSO is based indicating the frequency with which these processes are carried out. Describe the assessment processes that demonstrate the degree to which the POs and PSOs are attained and document the attainment levels)

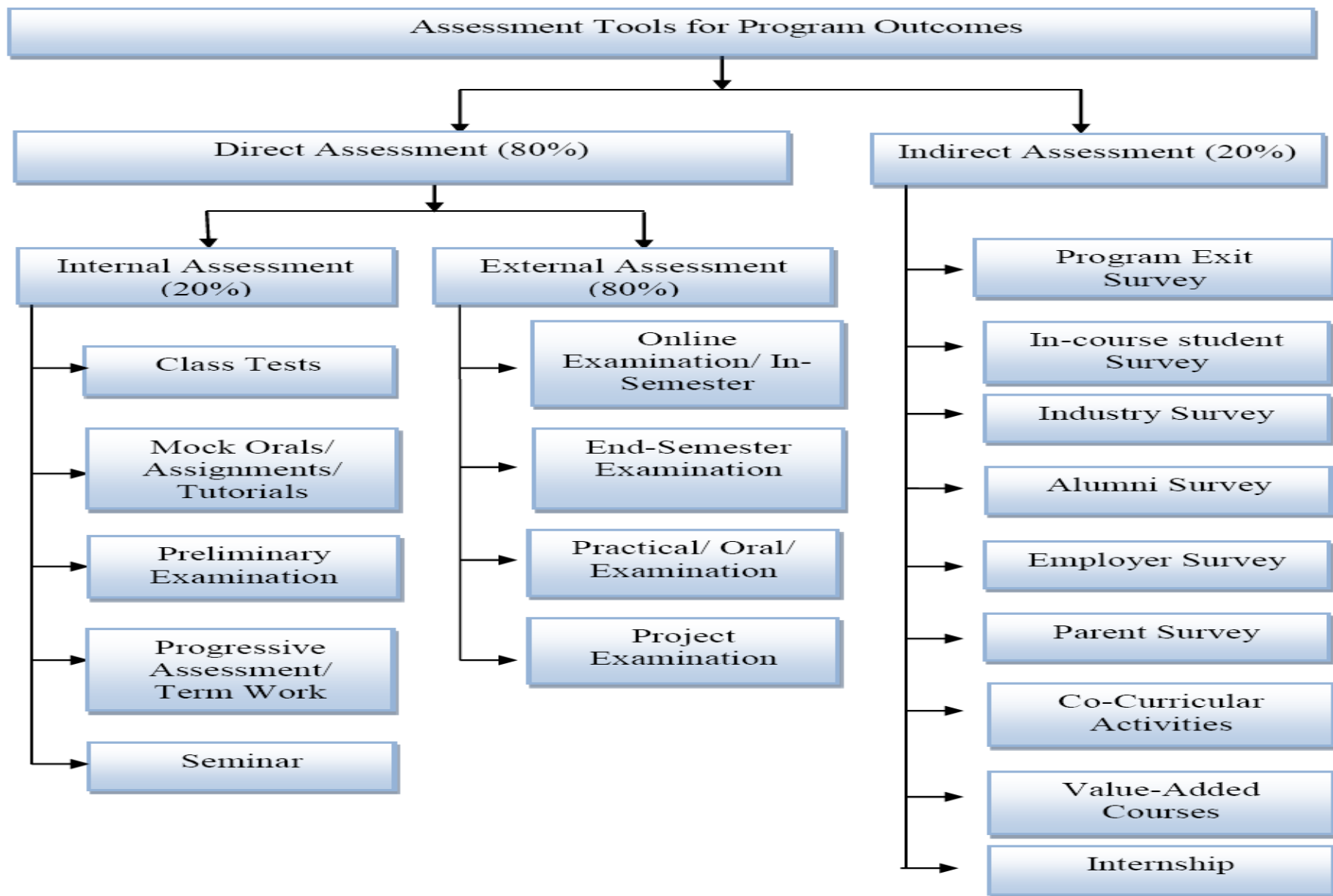


Figure B 3.3.1 Assessment Tools for Program Outcomes

Sr. No	Assessment Criteria	Assessment Tool	Assessment Method	
1	Marks obtained, average results, successful students, etc.	Nature of Exam Questions (Refer Table B 3.3.1(B))	Course examination result (Refer Table B 3.3.1(B))	Direct Assessment
2	Number of students satisfied with the course content and delivery	Student Feedback	Program Exit Survey	Indirect Assessment
3	Number of students satisfied with the course content and delivery	In-course Student Feedback	In-course Student Survey	
4	Relevance of curriculum and content	Percentage of Placement	Industry Survey	
5	Quantitative data of demonstration of various abilities in profession.	Alumni Feedback	Alumni Survey	
6	Number of Graduates fulfills the expectations of Employer	Employer Feedback	Employer Survey	
7	Level of satisfaction in terms of overall improvements	Parent Feedback	Parent Survey	
8	Participation and organization of various activities	Co-Curricular Activities	Publication and Rewards	
9	Number of students satisfied with the course content and delivery	Student Feedback	Value-Added Courses	
10	Quantitative data of placement and enterprise.	Percentage of Placement	Placement/Entrepreneur	

3.3. Attainment of Program Outcomes and Program Specific Outcomes

3.3.2. Provide results of evaluation of each PO & PSO (40)

Program shall set Program Outcome attainment levels for all POs & PSOs.

(The attainment levels by direct (student performance) and indirect (surveys) are to be presented through Program level Course – PO & PSO matrix as indicated)

3.3. Attainment of Program Outcomes and Program Specific Outcomes

Calculation of attainment of POs through Direct Assessment

$$\text{Attainment of } PO_j \text{ from course} = \frac{\sum_{i=1}^m (\text{CO:PO Correlation level} \times \text{CO Attainment})}{\sum_{i=1}^m \text{CO:PO Correlation level}}$$

where, i = no. of COs, $i=1, 2, 3 \dots 6$
 j = no. of POs, $j=1, 2, 3 \dots 12$

Calculation of attainment of POs using data collected through Survey in Indirect Assessment

$$\text{PO Attainment (\%)} = \frac{\sum_i PI_i}{\sum_i \text{max} PI_i}$$

3.3. Attainment of Program Outcomes and Program Specific Outcomes

3.3.2. Provide results of evaluation of each PO & PSO (40)

Example:

1. It is assumed that a particular PO has been mapped to four courses C2O1, C3O2, C3O3 and C4O1
2. The attainment level for each of the four courses will be as given in 3.2.2
3. PO attainment level will be based on attainment levels of direct assessment and indirect assessment
4. For affiliated, non-autonomous colleges, for overall attainment level 80% weightage may be given to direct assessment and 20% weightage to indirect assessment through surveys from students(largely), employers (to some extent).

Program may have different weightages with appropriate justification.

3.3. Attainment of Program Outcomes and Program Specific Outcomes

3.3.2. Provide results of evaluation of each PO & PSO (40)

Example contd..

Direct Assessment: C201 –High (3) ; C302 – Medium (2) ; C303 – Low (1) ;C401 – High (3)

Attainment level will be summation of levels divided by no. of courses
 $3+2+1+3/4=9/4=2.25$

Indirect Assessment Surveys, Analysis, customized to an average value as per levels 1, 2 & 3.

Assumed level - 2

6. PO Attainment level will be 80% of direct assessment + 20% of indirect assessment i.e. $1.8 + 0.4 = 2.2$.

Note: Similarly for PSOs.

Thank You..