Dr. J. J. Magdum Trust's

Dr. J. J. Magdum College of Engineering, Jaysingpur

NBA

Guidelines For CO-PO Attainment

Your Dream, Our Mission

Contents

1.1 Department Advisory Board [DAB]

Objective:

The Advisory Committee's purpose is to strengthen the Career and Technical Education programs it serves. The committee exists to advise, assist, support and advocate for career and technical education. It has no legislative, administrative or programmatic authority and is advisory only. Advisory Committees work cooperatively with college officials in planning and carrying out committee work. Members are volunteers appointed by the principal who share an expert knowledge of the career tasks and competency requirements for specific occupations. The committee may serve a specific career and technical education program or a combined committee may serve several programs.

Core Function:

Committee Members have the responsibility to advise, assist, support and advocate for activities designed to strengthen and modernize career and technical education.

- Review the curricular Gaps obtained and suggest the plans to fill the curricular gaps.
- Help to determine committee priorities and ways to achieve them.
- Verify the various academic activities preparation done by the faculty members for their respective courses.
- Discuss and resolve the issues related to Teaching-Learning Process.

Structure of DAB:

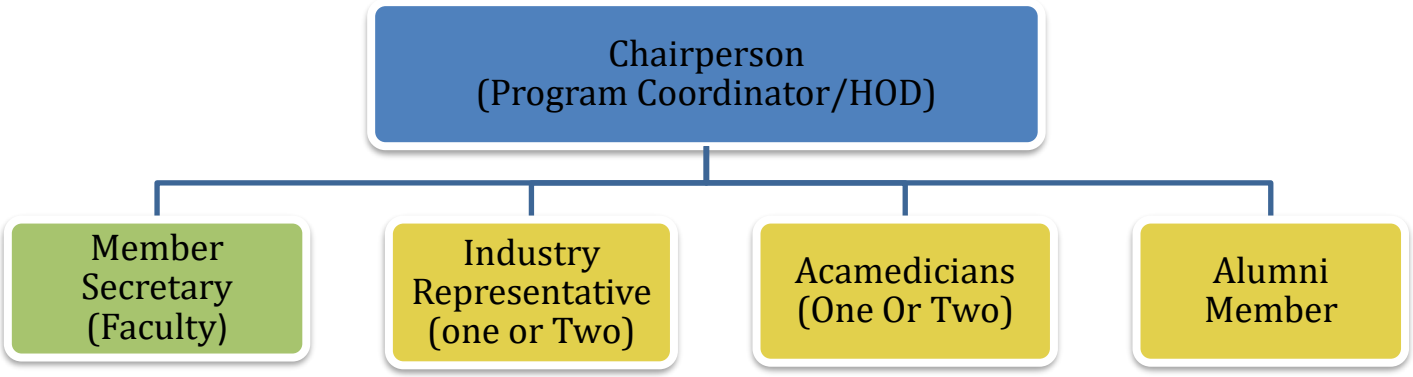


Figure 1: Structure of Department Advisory Board (DAB)

1.2 Program Assessment and Quality Improvement Committee [PAQIC]

The Program Assessment and Quality Improvement Committee (PAQIC) has been formed for monitoring of different departmental activities. The PAQIC consists of faculty members of the departments who periodically monitors the Departmental activities and evaluates different parameters.
The Program Assessment and Quality Improvement Committee shall have general oversight of all issues related to the processes of program review. The committee's duties include, but are not limited to: advising programs undergoing review with regard to the processes, objectives and specific tasks associated with that review; In pursuit of these duties, the committee may create ad hoc subcommittees.

Core Function:

The PAQIC is entrusted with the following responsibilities

- Review submitted assessment plans and reports and recommend revisions as appropriate.
- Monitoring the achievements of Program Outcomes (POs), Program Specific Outcomes (PSOs) and Program Educational Objectives (PEOs).
- Evaluating program effectiveness and proposing necessary changes.
- Preparing periodic reports on program activities, progress, status or other special reports for management.
- Interacting with students facilitating the achievement of POs, PSOs and PEOs.

Structure of PAQIC:

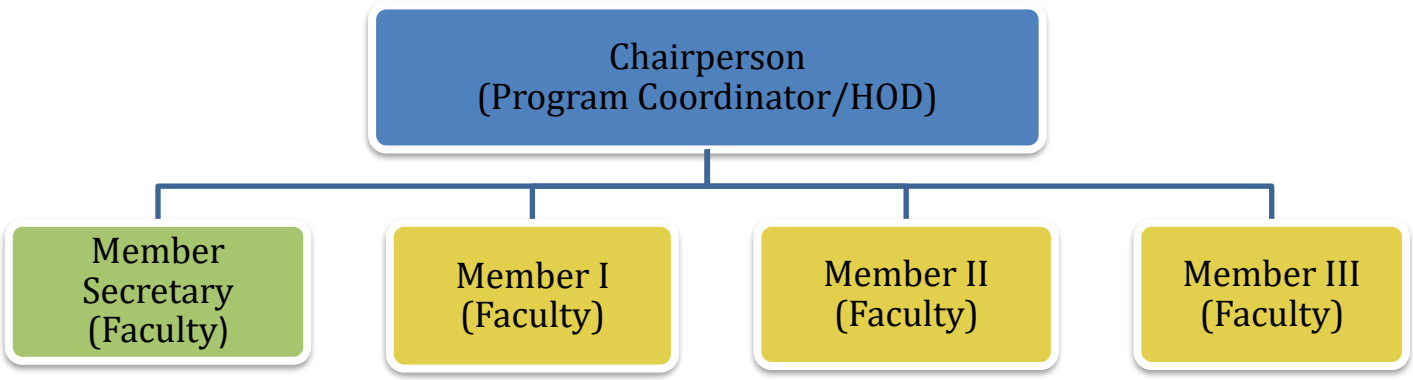


Figure 2: Structure of Department Advisory Board (PAQIC)

Program Curriculum and Teaching –Learning Processes

2.1 Process to Identify Curricular Gaps

- In order to identify the curricular gaps, the program must consider course articulation matrix i.e., CO-PO & CO-PSO mapping done by the course coordinator for the current academic year.
- The courses starting from First Year to Final Year need to be consider. In other words, the courses delt by the student under the program need be enlisted in the matrix.
- It is important to note that the Curricular gaps are obtained by considering the courses taught in the respective academic year irrespective their schemes.
- Create the table Mapping of POs and PSOs with all courses.
  - Mapping Value is Y or ✓ if at least one CO of the course is mapped with respective PO or PSO
  - Mapping Value is N or - if not a single CO of the course is mapped with respective PO or PSO
- The target set to identify the curricular gaps is 60% of mapping of all Courses with PO'S and PSO's.
  - Say if the number of Courses mapped with PO1 to PO12 and all PSO's are less than 60% curricular gap exists with respect to that PO or PSO.
  - Say if the number of Courses mapped with PO1 to PO12 and all PSO's are greater than 60% curricular gap does not exists with respect to that PO or PSO.

- With reference to the Figure 3 curricular gap exists for PO6 to PO12, since mapping of courses with PO's is less than 60%
- After identifying the gap for each course, the gap recovery strategy is decided by the course teacher. To bridge the gap, different activities are carried out by course teacher like workshops, Class room instructions, NPTEL videos, industrial visits and providing course materials.

Sr. No.	Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
1	C201	√	√	√											
2	C202	√	√	√	√									√	√
3	C203	√	√	√	√								√	√	√
4	C204	√	√	√	√	√	√	√					√		√
5	C205	√	√	√	√	√	√								
6	C206	√	√	√	√						√		√	√	√
7	C207								√	√	√		√		
8	C208	√	√	√	√	√								√	√
9	C209	√	√	√	√	√	√						√		√
10	C210	√	√	√	√									√	√
11	C211	√	√	√	√									√	
12	C212	√	√	√	√	√									
13	C213	√	√	√	√						√		√	√	√
14	C214	√	√	√	√	√			1	1		√	√	√	√
15	C215	√	√	√	√	√	√	√	√	√	√	√	√	√	√
16	C301	√	√	√			√							√	
17	C302	√	√	√	√	√								√	√
18	C303	√	√	√	√	√								√	√
19	C304	√	√	√	√	√	√							√	√
20	C305	√	√	√	√	√	√	√		√		√	√		√
21	C306	√	√	√	√	√			√						
22	C307								√	√	√		√		
23	C308	√	√	√	√	√								√	√
24	C309	√	√											√	√
25	C310	√	√	√	√	√	√							√	√
26	C311	√	√	√	√									√	√
27	C312	√	√	√	√	√	√							√	
28	C313	√	√	√	√	√									
29	C314	√	√	√	√	√	√	√	√	√	√	√	√	√	√
30	C401	√	√	√	√									√	√
31	C402	√	√	√	√	√	√							√	√
32	C403	√	√	√	√	√	√						√	√	√
33	C404	√	√	√	√	√	√							√	
34	C405	√	√	√	√	√								√	√
35	C406	√	√	√	√	√	√	√	√	√	√	√	√	√	√
36	C407	√	√	√	√	√	√		√	√	√	√	√	√	√
37	C408	√	√	√	√	√								√	√
38	C409	√	√	√	√	√	√						√	√	√
39	C410	√	√	√	√	√	√						√	√	√
40	C411	√	√	√	√	√								√	√
41	C412	√	√	√	√	√	√							√	
42	C413	√	√	√	√	√	√	√	√	√	√	√	√	√	√
43	C414	√	√	√	√	√	√	√	√	√	√	√	√	√	√
		95.34	95.34	93.02	98.37	69.76	53.58	16. 27	23.25	23.25	23.25	18.60	58.13	76.74	69.76

Table 1: Table Mapping of POs and PSOs with courses

2.2 Process to Identify Advanced and Slow Learners

Identification of Slow and advanced learners place a vital importance in the present scenario in the teaching learning process. Categorization of students in to such groups will help the students in performing better in their Academics as well as co-curricular activities. It's a great challenge for a faculty to categories students into such groups. In order to ease out the process of identification of a student as an advanced or slow learner, a common process is formulated and adopted across all the departments in the college. The detailed description about the process is as follows,

1. Student's performance is evaluated through Continuous Internal Evaluations (CIEs) and active participation in class discussions.
2. Students who achieve less marks are identified as slow learners
3. Students having good marks are considered as advanced learners.

Table: 2 Action Plan for advanced and slow learners

Classification	Action Plan	Documents need to be maintained
Advanced Learners	• Conduct expert lectures on advanced topics • University rankers & class rankers are felicitated on annual day • Motivating to publish papers/ carryout mini projects/ participation in workshop etc., • Motivating to take up Competitive exams (JAM/ GATE/CLAT/ GMAT/ CAT/ GRE/ TOEFL/ Civil Services/State government examinations) • Attending awareness/ training programs to become an entrepreneur.	• Participation Certificates • Score Cards • Report
Slow Learners	• Conduct remedial classes • Mentoring/Motivating to do well in Academics. • Extra Assignments • Extra Study Materials (Solved Question Paper, Book bank facility, Question Bank, Departmental library usage) • Open Book test	• Circulars • Timetable • Attendance • Progress record • Assignment copies • Links related Study materials shared

Course Outcomes (CO) and Program Outcomes (PO)

3.1 Course outcomes (CO)

These statements indicate the knowledge, skills and qualities (KSQs) which the students are expected to know and demonstrate as a result of learning at the end of the course.

Course outcomes are statements that describe what a student will be able to do after completing a course. They help students and faculty understand the course's goals and purpose.

Table: 3 Course Outcome

Course Name:	**Year of Study:**
C202.1	<Statement>
C202.2	<Statement>
C202.3	<Statement>
…..	<Statement>
C202.N	<Statement>

C202 is the second course in second year and '.1' to '.6' are the outcomes of this course.

Table: 4 CO-PO and CO-PSO matrices

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1														
C202.2														
C202.3														
……														
C202.N														
C301.1														
C301.2														
C301.3														
……														
C301.N														

C202 is the second course in second year and '.1' to '. N' are the outcomes of this course.

C301 is the first course in Third Year and '.1' to '. N' are the outcomes of this course.

Table: 5 Program Level Course-PO Matrix of all Courses INCLUDING First Year Courses

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
I SEMESTER														
C101	2.75	2.75	1.75	1.75					1.00	1.00				

C107	3.00					3.00	3.00							
II SEMESTER														
C108	3.00	3.00												

C114	3.00					3.00	3.00							
III SEMESTER														
C201	3.00	3.00	2.00											

C207								2.00	2.00	2.33		2.00		
IV SEMESTER														
C208	3.00	2.50	3.00	2.00	2.50								2.00	1.00

C215	1.75	2.25	1.75	1.50	2.00	2.50	3.00	2.75	2.50	2.00	1.50	2.75	2.25	2.50
V SEMESTER														
C301	3.00	3.00	3.00			1.00							2.00	

C307								2.00	2.00	2.00		2.00		
VI SEMESTER														
C308	2.50	2.50	3.00	3.00	2.00			2.00					2.00	2.30

C314	2.00	2.67	2.25	1.50	2.00	2.50	2.33	2.00	2.75	2.25	2.50	3.00	2.00	3.00
VII SEMESTER														
C401	3.00	2.80	3.00	2.25									2.67	3.00

C407	3.00	2.00	3.00	3.00	2.00	2.00		2.00	2.00	2.33	2.33	2.33	2.00	2.00
VIII SEMESTER														
C408	2.50	3.00	3.00	2.00	2.00								2.30	3.00

C414	1.75	2.25	1.75	1.50	2.00	2.50	3.00	2.75	2.50	2.00	1.50	2.75	2.25	2.25

- 2.75 is the Average value of corresponding CO's of C101 course for PO1
- Similarly, for all the courses including first Year is listed in the above table.

3.2. Attainment of Course Outcomes

- In order to obtain the CO attainment of the respective course both direct attainment and Indirect attainments are considered.
- Direct attainment is based on performance of the students in the Internal Assessment and External Assessment
  - Internal assessment tools like, assignment, Project Presentation. Quiz, Continuous Internal Evaluation (CIE), Term Work are used.
  - External assessment tools like End Semester Examination (ESE), Practical Oral Examination (POE) are used.
- Indirect assessment is based on the Feed backs given by the students on the Course outcomes known as Course Exit Survey.

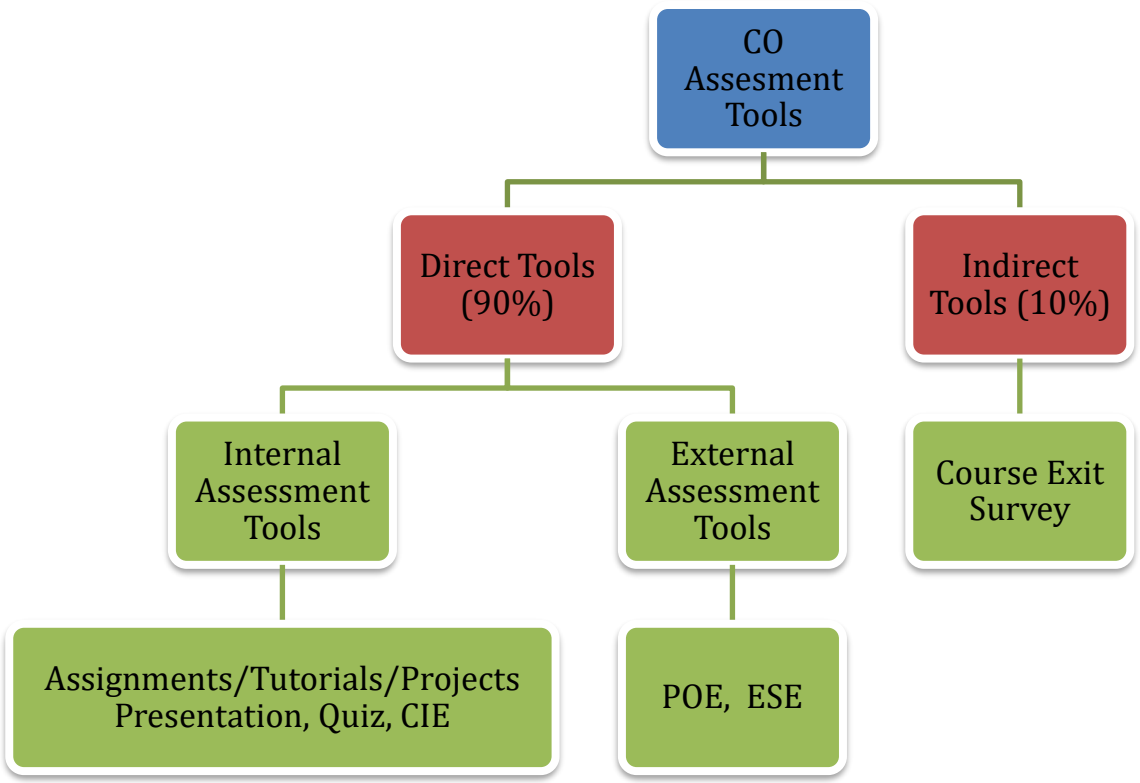


Figure 4: CO Assessment tool

Detail procedure for Obtaining CO attainment:

3.2.1 Attainment of Course Outcomes-Direct Method

STEP 1: Course attainment level is varied depending upon difficulty of subjects.
Attainment levels for Course Outcomes (COs) mapping are as follows.

- Attainment Level 1: Percentage students scoring more than average marks is between 40% to 50%
- Attainment Level 2: Percentage students scoring more than average marks is between 51% to 60%
- Attainment Level 3: Percentage students scoring more than average marks is above 61%

STEP 2: All the faculties handling the courses will map the student performance of internal assessment (i.e. CIE I/CIE II/QUIZ/Assignments/Practical etc.) in to the excel sheet.

Figure 5*: *Attainment of CO through Internal Assessment (e.g. CIE II)

Dr. J .J. Magdum College of Engineering, Jaysingpur

Department of Artificial Intelligence & Data Science

Continuous Internal Evaluation - II | **Subject: Data Visualization**

Class: SY **Sem: I** | **Academic Year: 2023-24**

Roll No	Name of Student	Q1						Q2			
		CO1	CO1	CO2	CO2	CO4	CO2	CO2	CO1	CO2	CO3
		1	2	3	4	5	6	1	2	3	4
63	Manish Kamble	0	0	0	1	0	0		2		
64	Susmita Naik	1	1	1	1	1	1	2	7		4
65	Vrushali Rakshe	1	1	0	1	1	1		4		3
66	Safi Nadaf	1	1	0	1	1	1	8	4		7
67	Arman Shikalgar	0	1	0	1	1	0		6	5	
	AVERAGE MARKS	0.40	0.84	0.75	0.72	0.87	0.61	4.76	4.05	4.31	5.07
	No. of students above average marks	27	56	50	48	58	41	21	20	8	17
	No of students attempted	67	67	67	67	67	67	42	58	16	45
	percentage of students scoring ≥ avg marks	40.30	83.58	74.63	71.64	86.57	61.19	50.00	34.48	50.00	37.78
		CO1	CO1	CO2	CO2	CO4	CO2	CO2	CO1	CO2	CO3
	Attainment Level	1	3	3	3	3	3	2	1	2	1
		Direct Attainment Through CIE-II									
	CO	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	CO9	CO10
	Sum	5	13	1	3	0	0	0	0	0	0
		3	5	1	1	0	0	0	0	0	0
	Avg Attainment	1.67	2.60	1.00	3.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

STEP 3: Attainment level of all the internal assessment tools is calculated in scale of 0 to 3 based on what percentage of students scoring above average marks.

Example:

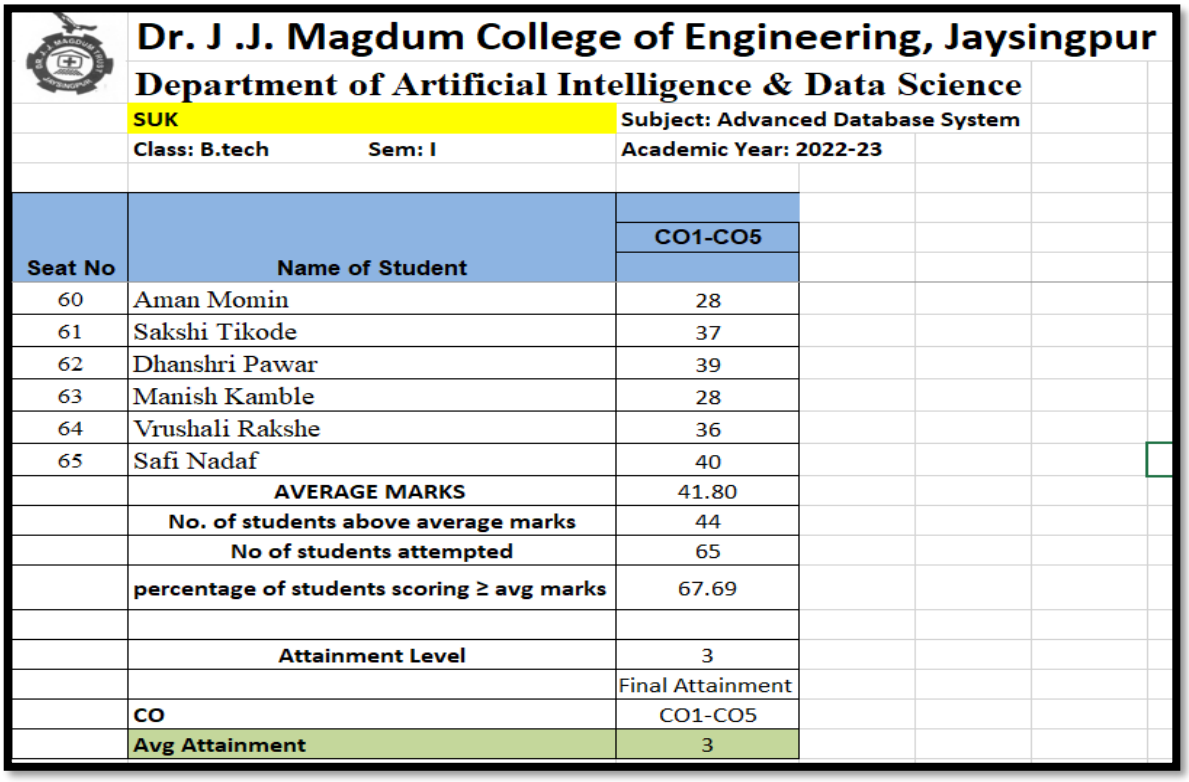
- If Q1.1 is asked for 1 Mark, 64 students have attempted the question, and 96.88% of students scored above average marks.
- Then attainment level of Q1.1 is 3 according to the attainment levels set in Step 1. Refer Fig 5.

STEP 4: For External Assessment calculation enter the End Semester Examination (ESE) marks in to Excel sheet. since, University Papers does not have question wise CO mapping currently, we calculate attainment in scale of 0 to 3 based on percentage of students scoring above average marks and choose attainment level according to step 1 and assign that level to all the CO's available for the course.

Example:

- If average marks scored by students is 41.80 for a course out of 70 Marks and 67.69% students scored above average marks. then attainment level is 3 according to step 1.
- Here we assign same level to all CO's of the course, refer the Fig. 6

Figure 6: Attainment of CO through External Assessment



Dr. J .J. Magdum College of Engineering, Jaysingpur

Department of Artificial Intelligence & Data Science

	SUK	**Subject: Advanced Database System**
	Class: B.tech Sem: I	**Academic Year: 2022-23**

Seat No	**Name of Student**	**CO1-CO5**
60	Aman Momin	28
61	Sakshi Tikode	37
62	Dhanshri Pawar	39
63	Manish Kamble	28
64	Vrushali Rakshe	36
65	Safi Nadaf	40
	AVERAGE MARKS	41.80
	No. of students above average marks	44
	No of students attempted	65
	percentage of students scoring ≥ avg marks	67.69
	Attainment Level	3
		Final Attainment
	CO	CO1-CO5
	Avg Attainment	3

STEP 5: The Direct attainment of the COs is calculated by simple average of Internal Assessment (IA) and External Assessment (EA).

	Direct Attainment						
CO's ↓	**Internal Assessment Tools (IA)**				**External Assessment (EA)**	**Average (IA & EA)**	**90% of Direct Attainment**
	CIE – I	CIE – II	Quiz	Practical	SUK/ESE	Direct Attainment	(A)
CO1	2.17	1.67	0.00	3.00	3	1.71	1.54
CO2	2.25	2.60	2.33	3.00	3	2.55	2.29
CO3		1.00	0	3.00	3	1.33	1.20
CO4		3.00	3	3.00	3	3.00	2.70
CO5			3	3.00	3	3.00	2.70
CO6			2	3.00	3	2.50	2.25

Figure 7: CO attainment-Direct Method

3.2.2 Attainment of Course Outcomes-Indirect Attainment

CO attainment is also need to be calculated through Indirect assessment. The Indirect assessment is calculated by using course exit survey which is a feedback tool used to gather information from students at the end of a course. Its purpose is to assess the effectiveness of the course. Typically administered in the final week of the course, the survey covers course content in the form of CO statements.

- Faculty will receive feedback on COs at the end of the course (End of semester). Student will rate each COs in the scale of 1 to 5 based on his understanding level on the course taught
- Enter correlation levels 1to 5 as defined below:
  1: Not Agreed 2: Partially Satisfied 3: Satisfied 4: Agreed 5: Strongly Agreed
- Attainment Level decided by calculating percentage of students scored above average correlation level.
- If average correlation for CO1 is 4.52 and 65.22% students score more than average correlation then attainment level is 3. (refer 3.2.1 step 1)

Figure 8: CO assessment through Course Exit Survey/Indirect Attainment

Dr. J .J. Magdum College of Engineering, Jaysingpur

Department of Artificial Intelligence & Data Science

Course Exit | **Subject: Data Visualization**

Class: SY **Sem: I** | **Academic Year: 2023-24**

Roll No	Name of Student	CO1	CO2	CO3	CO4	CO5	CO6
		1	2	3	4	5	6
46	Mohammad Saad Shaikh	5	5	5	5	5	5
54	Sanika Sutar	3	4	3	5	3	4
56	Samiksha Terdale	5	4	4	5	4	4
59	Rajashri Yarakdavar	5	4	5	4	5	4
60	Aman Momin	5	5	5	5	5	5
61	Sakshi Tikode	5	5	5	4	5	4
65	Vrushali Rakshe	5	5	5	5	5	5
67	Arman Shikalgar	5	5	5	5	4	5
	AVERAGE MARKS	4.52	4.39	4.61	4.43	4.35	4.30
	No. of students above average marks	15	12	15	12	12	10
	No of students attempted	23	23	23	23	23	23
	percentage of students scoring ≥ avg marks	65.22	52.17	65.22	52.17	52.17	43.48
		CO1	CO2	CO3	CO4	CO5	CO6
	Attainment Level	3	2	3	2	2	1
		Indirect Attainment Through Course Exit Survey					
	CO	CO1	CO2	CO3	CO4	CO5	CO6
	Sum	3	2	3	2	2	1
		1	1	1	1	1	1
	Avg Attainment	3.00	2.00	3.00	2.00	2.00	1.00

	Indirect Attainment	
CO's ↓	Indirect Attainment Course Exit Survey	10% OF Indirect Attainment (B)
CO1	3.00	0.3
CO2	2.00	0.2
CO3	3.00	0.3
CO4	2.00	0.2
CO5	2.00	0.2
CO6	1.00	0.1

3.2.3 Overall CO Attainment:

Overall CO attainment is calculated by considering Direct CO attainment (IA & EA) and Indirect CO attainment (Course Exit Survey). Direct CO attainment is weighted to 90% and Indirect CO attainment is weighted for 10%.

Figure 9: Overall CO attainment

	Direct Attainment							Indirect Attainment		OVERALL ATTAINMENT (A+B)
CO's ↓	Internal Assessment Tools (IA)				External Assessment (EA)	Average (IA & EA)	90% of Direct Attainment	Indirect Attainment	10% OF Indirect Attainment	
	CIE – I	CIE – II	Quiz	Practical	SUK/ESE	Direct Attainment	(A)	Course Exit Survey	(B)	
CO1	2.17	1.67	0.00	3.00	3	1.71	1.54	3.00	0.3	1.84
CO2	2.25	2.60	2.33	3.00	3	2.55	2.29	2.00	0.2	2.49
CO3		1.00	0	3.00	3	1.33	1.20	3.00	0.3	1.50
CO4		3.00	3	3.00	3	3.00	2.70	2.00	0.2	2.90
CO5			3	3.00	3	3.00	2.70	2.00	0.2	2.90
CO6			2	3.00	3	2.50	2.25	1.00	0.1	2.35

The values thus obtained in final column in fig 9 are the overall COs attainment for the course for the current Year.

Note: Similar process is carried out for Laboratory courses.

- External Assessment (EA) / POE is carried out and maintained record of the same.
- Internal Assessment (QUIZ and Practical) is carried out maintained record of the same.
- Direct attainment is calculated by taking average of IA and EA.
- Indirect attainment is calculated by using Course Exit Course.
- The Overall CO attainment is Carried out by considering 90% of the weightage to the Direct attainment and 10% of the weightage to Indirect attainment.

3.2.4 Setting Target & Gap Analysis

- Targets for CO attainments from academic year 2020-21 are drawn from COs attainment (direct and indirect attainment) of previous year i.e., 2019-20.
- The CO attainments are compared with targets for the gap analysis.
- If gap exist then, each course coordinator will take necessary action to bridge the gap and keep the same target for next year.
- If gap does not exist then, target for next year will be increased by 5%
- Initially the targets for CO attainments are decided by respective department depending on CIE, SUK results.

3.3. Attainment of Program Outcomes and Program Specific Outcomes

3.3.1. Provide Results of Evaluation of each PO & PSO

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).

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101														
C102														

C409														
Direct attainment														
Indirect Attainment														
Over all PO attainment														

C101, C102 are indicative courses in the first year. Similarly, C409 is final year course. First numeric digit indicates year of study and remaining two digits indicate course nos. in the respective year of study.

- Direct attainment level of a PO & PSO is determined by taking average across all courses addressing that PO and/or PSO. Fractional numbers may be used up to two decimal places.
- Indirect attainment level of PO & PSO is determined based on the surveys.

3.3.2 Calculation of PO attainment (2019-2023 Batch):

Following are the steps need to be followed to obtain the PO attainment.

Step 1: Course coordinator should enter the Course articulation matrix as per the course module in the CO-PO-PSO assessment tool.

PO / CO	Overall CO Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2.09	-	3	2	-	-	1	-	-	-	-	-	-	-	-
CO2	1.95	3	-	-	1	2	-	-	-	-	-	-	-	3	-
CO3	1.80	-	2	3	-	-	-	-	-	-	-	-	-	-	-
CO4	1.70	-	-	-	3	1	-	-	-	-	-	-	-	-	3
	Avg PO	3	2.5	2.5	2	1.5	1	-	-	-	-	-	-	3	3

Figure 10: CO-PO-PSO Mapping of respective Course

Step 2: PO/PSO Attainment = (Mapping Value/ 3) * Overall CO Attainment.
Mapping value and overall CO attainment is taken from CO-PO-PSO Mapping table (Refer Step 1). Final PO/PSO attainment is just the average of respective PO.
Example: Final PO attainment of PO2 is 1.65 which is average of 2.09 & 1.20 refer Fig. 11

PO / CO	Overall CO Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2.09	-	2.09	1.39	-	-	0.7	-	-	-	-	-	-	-	-
CO2	1.95	1.95	-	-	0.65	1.3	-	-	-	-	-	-	-	1.95	-
CO3	1.80	-	1.2	1.8	-	-	-	-	-	-	-	-	-	-	-
CO4	1.70	-	-	-	1.7	0.57	-	-	-	-	-	-	-	-	1.7
Final PO/PSO Attainment		1.95	1.65	1.6	1.7	1.3	0.7	-	-	-	-	-	-	1.95	1.7

Figure 11: Average PO-PSO attainment of respective course

Step 3: PO and PSO attainment through direct assessment is thus calculated by average of respective PO/PSO for all course from 2019 to 2023 refer Fig. 12

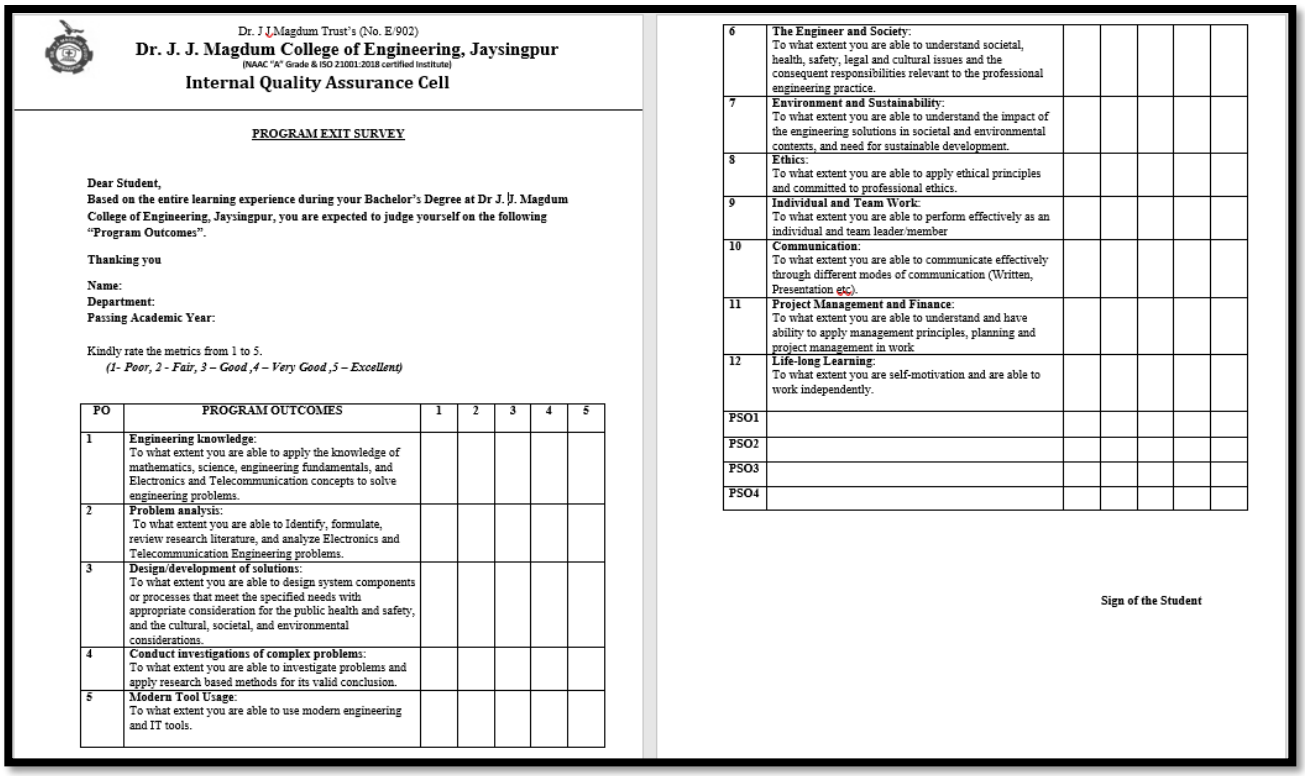
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
CO-PO ATTAINMENT
BATCH 2019-2023

	Sr. No	Code No.	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
FY 2019-20	1	C-101	Engg. Physics	2.44	2.44	1.55	1.55					0.89	0.89						
	2	C-102	Engg. Maths-I	2.33	2.33	1.55													
	13	C-113	Professional Communication-II								3	3	3						
	14	C-114	Workshop Practice-II																
SY 2020-21	1	BSC-ETC301	Engineering Mathematic	2.89	2.89	1.93	1.20									2.89			
	2	PCC-ETC-301	Electronic Circuit Desig	2.81	2.75	2.75	2.00	1.87	0.91							2.00	3.00	2.00	3.00
	5	PCC-ETC405	Data Structures	2.57	1.78	2.50	1.80		2.66							2.57			2.66
	6	PCC-ETC406	Programming Lab-II	1.60	1.50	1.50		2.00								2.50			1.60
TY 2021-22	1	PCC-ETC501	Signal and Systems	1.75	2.94	2.94	2.34									2.82	1.75		
	2	PCC-ETC502	Electromagnetic Engine	2.3	2.5		1.6			-	-						1.53	1	1.6
	5	OEC-ETC601	Mobile Technology	1.95	1.44	2.17	2.32	1.53								1.32			2.32
	6	PCC-ETC605	Mini Project	2.32	2	2	1.32	1.32	--	--	--	1.45	1.9	1.9	--	1.47	--	1.65	--
Btech 2022-23	1	PCC-ETC701	Satellite Communication	1.83	2.1	1.45	1.45	1.83	-	-	-	-	-	-	-	0.94	0.96		
	2	PCC-ETC702	Embedded Systems	1.3	1.3	1.30	1.60	1.70	-	-	-	-	-	-	-	1.70	1.70		
	5	PW-ETC801	Project Phase-II	3	3	3	3	3	3	3	3	3	3	3	3	2	3		
		PO ATTAINMENT THROUGH DIRECT TOOL		**2.27**	**2.14**	**2.10**	**2.00**	**2.12**	**1.83**	**2.07**	**2.46**	**1.99**	**2.31**	**2.00**	**2.58**	**1.96**	**1.89**	**1.30**	**2.17**

Figure 12: PO-PSO attainment through Direct Assessment

Step 5: Indirect Assessment of PO/PSO is calculated by considering the surveys. The surveys will be taken at the end of the program. (i.e., end of 8th semester).

- In each survey the average values of individual POs and PSOs of the program are taken. Then percentage of students above average value is identified. Using this percentage attainment level is identified (refer 3.2.1 step 1)



Dr. J J.Magdum Trust's (No. E/902)

Dr. J. J. Magdum College of Engineering, Jaysingpur

(NAAC "A" Grade & ISO 21001:2018 certified Institute)

Internal Quality Assurance Cell

PROGRAM EXIT SURVEY

Dear Student,
Based on the entire learning experience during your Bachelor's Degree at Dr J. J. Magdum College of Engineering, Jaysingpur, you are expected to judge yourself on the following "Program Outcomes".

Thanking you

Name:
Department:
Passing Academic Year:

Kindly rate the metrics from 1 to 5.
(1- Poor, 2 - Fair, 3 – Good ,4 – Very Good ,5 – Excellent)

PO	PROGRAM OUTCOMES	1	2	3	4	5
1	**Engineering knowledge**: To what extent you are able to apply the knowledge of mathematics, science, engineering fundamentals, and Electronics and Telecommunication concepts to solve engineering problems.					
2	**Problem analysis**: To what extent you are able to Identify, formulate, review research literature, and analyze Electronics and Telecommunication Engineering problems.					
3	**Design/development of solutions**: To what extent you are able to design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.					
4	**Conduct investigations of complex problems**: To what extent you are able to investigate problems and apply research based methods for its valid conclusion.					
5	**Modern Tool Usage**: To what extent you are able to use modern engineering and IT tools.					
6	**The Engineer and Society**: To what extent you are able to understand societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.					
7	**Environment and Sustainability**: To what extent you are able to understand the impact of the engineering solutions in societal and environmental contexts, and need for sustainable development.					
8	**Ethics**: To what extent you are able to apply ethical principles and committed to professional ethics.					
9	**Individual and Team Work**: To what extent you are able to perform effectively as an individual and team leader/member					
10	**Communication**: To what extent you are able to communicate effectively through different modes of communication (Written, Presentation etc).					
11	**Project Management and Finance**: To what extent you are able to understand and have ability to apply management principles, planning and project management in work					
12	**Life-long Learning**: To what extent you are self-motivation and are able to work independently.					
PSO1						
PSO2						
PSO3						
PSO4						

Sign of the Student

Figure 13: Program Exit Survey Format

Step 6: final average value of the attainment is obtained, as shown below.

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
CO-PO ATTAINMENT
BATCH 2019-2023

Sr. No	Code No.	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	PO ATTAINMENT THROUGH INDIRECT TOOL(Program exit survey)		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	PO ATTAINMENT THROUGH INDIRECT TOOL(Alumini Survey)		3.00	3.00	3.00	3.00	2.00	3.00	2.00	1.00	2.00	3.00	3.00	3.00	2.00	3.00	2.00	2.00
	AVERAGE INDIRECT ATTAINMENT		**3.00**	**3.00**	**3.00**	**3.00**	**2.50**	**3.00**	**2.50**	**2.00**	**2.50**	**3.00**	**3.00**	**3.00**	**2.50**	**3.00**	**2.50**	**2.50**

Figure 14: PO-PSO attainment through Indirect Assessment

Step 7: Overall attainment of PO and PSO is obtained by considering Direct and Indirect assessment with the weightage of 90% and 10% respectively.

- The direct attainment of POs and PSOs are obtained separately by listing out all the Course attainments of POs and PSOs (direct attainment) in the program.
- The indirect attainment of POs and PSOs are obtained through surveys as mentioned in the Step 6 for the Program.

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION CO-PO ATTAINMENT BATCH 2019-2023																	
Sr. No	Code No.	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	PO ATTAINMENT THROUGH DIRECT TOOL		2.27	2.14	2.10	2.00	2.12	1.83	2.07	2.46	1.99	2.31	2.00	2.58	1.96	1.89	1.30	2.17
	PO ATTAINMENT THROUGH INDIRECT TOOL(Program exit survey)		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	PO ATTAINMENT THROUGH INDIRECT TOOL(Alumini Survey)		3.00	3.00	3.00	3.00	2.00	3.00	2.00	1.00	2.00	3.00	3.00	3.00	2.00	3.00	2.00	2.00
	AVERAGE INDIRECT ATTAINMENT		3.00	3.00	3.00	3.00	2.50	3.00	2.50	2.00	2.50	3.00	3.00	3.00	2.50	3.00	2.50	2.50
	FINAL PO/PSO ATTAINMENT		2.34	2.23	2.19	2.10	2.16	1.94	2.11	2.41	2.04	2.38	2.10	2.62	2.01	2.00	1.42	2.20

Figure 15: Overall PO/PSO attainment

Sample Calculation:

Overall **PO1** attainment = 0.9 X Direct Assessment + 0.1 X Indirect Assessment

= 0.7 X 2.27 +0.3 X 3

= 2.34

3.3.3 Setting Target for POs and PSOs attainments:

- The target level for PO/ PSO attainment for current year is PO/ PSO attainment level of the previous year.
  (Ex: Attainment of PO1 of the year 2018-19 is 1.95 will be considered as target level for PO1 of the 2019-20)
- Continuous Improvement is maintained with actions taken based on the results of the evaluation of each of the POs & PSOs as follows.

POs	TARGET LEVEL	ATTAINMENT LEVEL	OBSERVATIONS
PO1: Engineering Knowledge:			
PO1	2.25	2.28	**Observation**: Target level attained
Action 1: Arrangement of expert lectures to strengthen the basic concepts and fundamentals of the subjects concerned. **Action 2:** Tutorials conducted focusing the knowledge of engineering fundamentals.			
PO2: Problem Analysis:			
PO2	2.16	2.18	**Observation**: Target level attained
Action 1: Solving more numerical problems in tutorials. **Action 2:** Use of NPTEL video lectures to enhance student's analytical skills. **Action 3:** Provision of quizzes to improve analytical skills.			

Figure 16: POs Actions for improvement in the year