



VAAGESWARI COLLEGE OF ENGINEERING

Beside L.M.D Police Station, Ramakrishna Colony, Thimmapur, Karimnagar
(Approved by AICTE New Delhi & Affiliated to JNTU Hyderabad)

2.6.2 Attainment of program outcomes and course outcomes are evaluated by the institution.

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Principal
Vaageswari College of Engineering
KARIMNAGAR-505 527



VAAGESWARI COLLEGE OF ENGINEERING

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ATTAINMENT OF COURSE OUTCOMES

Assessment Process adopted for attainment of course outcomes for various courses:

Tools used for assessment:

Marks allocation by University: The division of marks given by university and weightages in arriving at the attainment of CO are given below. The CO assessment is carried out through CIE and SEE with the following proportions:

Table: Weightage of marks for CIE: SEE

Type of course	Internal Marks (CIE)	External Marks (SEE)	Total Marks	Net CO attainment level as per weightage
Theory	40	60	100	$0.40 \times \text{CIE Level} + 0.60 \times \text{SEE Level}$
Practical	40	60	100	$0.40 \times \text{CIE Level} + 0.60 \times \text{SEE Level}$
Real-Time (or) Field-based Research Project	50	-	50	CIE Level
Industrial Oriented Mini Project/ Internship/	-	100	100	SEE Level
Project Stage – I& II	40	60	100	$0.40 \times \text{CIE Level} + 0.60 \times \text{SEE Level}$
Mandatory course	100	-	100	CIE Level

Based on combined marks (i.e., CIE+SEE) obtained by the candidate, Letter grades are awarded as shown below and corresponding Grade Points are also shown in table.

% of Marks Secured in a Subject/Course (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points
Greater than or equal to 90%	O (Outstanding)	10
80 and less than 90%	A + (Excellent)	9
70 and less than 80%	A (Very Good)	8
60 and less than 70%	B + (Good)	7
50 and less than 60%	B (Average)	6
40 and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

Table: Letter Grades with respect to academic performance



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For attainment of course outcomes

- Final Letter grades obtained by each student in the course are made available by university.
- These Letter grades must be converted to marks as shown in below table.

% of Marks Secured in a Subject/Course	Letter Grade	Grade Points
Greater than or equal to 90%	O	1* Max SEE Marks
80 and less than 90%	A +	0.89* Max SEE Marks
70 and less than 80%	A	0.79* Max SEE Marks
60 and less than 70%	B +	0.69* Max SEE Marks
50 and less than 60%	B	0.59* Max SEE Marks
40 and less than 50%	C	0.49* Max SEE Marks
Below 40%	F	0.39* Max SEE Marks

Table: Conversion of Letter grades into corresponding marks

Frequency of Data Collection:

The data required for calculating attainment is to be gathered. Each course instructor maintains the data required like Internal Marks mid wise and external marks of their respective course. The frequency of data collection for each assessment tool is shown in a table

Assessment tool	Frequency
University Examination	Once a semester
Mid Examination	Twice a semester
Assignment	Twice a semester
PPT	Once a semester
Internal/ External La Examination	Once a semester

Attainment of CO's for Theory Courses:

Attainment of theory courses calculated based on student performance in Continuous Internal Evaluation (CIE) and semester End Examination (SEE)

$$\text{Overall CO attainment} = 0.40 * \text{CIE Level} + 0.60 * \text{SEE Level}$$

These values of the CO levels for the course are then used for mapping the PO attainments, using the array of target PO values for the course. The Procedure adapted for calculating the attainment of Course Outcomes for a Theory course is described with an example for the course Basic Electrical Engineering.



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VAAGESWARI COLLEGE OF ENGINEERING									
Department:		CSE(DATA SCIENCE)							
Course Outcome Attainment - Internal Assessments									
Name of the Faculty:		Mr.N.Kiran Kumar				Academic Year:		2022-23	
Branch & Section:		CSD				Exam:		Mid-1	
Course:		B.TECH				Semester:		1	
Sl. No	Roll Number	Question No.						Objective	Assignment
		1	2	3	4	5	6		
Maximum Marks		5	5	5	5	5	5	10	5
1	22S41A6701		3	3			2	8	5
2	22S41A6702	3		5	4	4		9	5
3	22S41A6703	4	4		3		4	10	5
4	22S41A6704	5	5		4		4	9	5
5	22S41A6705	2	3	3		3		9	5
6	22S41A6706		2	3	3	3		10	5
7	22S41A6707		4	4	4	4		9	5
8	22S41A6708	5		5	5		5	10	5
9	22S41A6709	4		5	4		4	10	5
10	22S41A6710		3	3		3	3	9	5
11	22S41A6711		4	4		5	4	10	5
12	22S41A6712	5		5	4	4		9	5
13	22S41A6713		3	4		3	4	9	5
14	22S41A6714	3	3		3		3	9	5
15	22S41A6715		4	3	5		4	10	5
16	22S41A6716		5	4		5	5	10	5
17	22S41A6717		3	4		2	2	10	5
18	22S41A6718	5	5		4	4		10	5
19	22S41A6719	4	2		2	4		9	5
20	22S41A6720	4	4		3	2		9	5
21	22S41A6721	3	2		1		3	8	5
22	22S41A6722	2		2	2		1	10	5
23	22S41A6723		4	3		2	3	8	5
24	22S41A6724		3	3		3	4	9	5
25	22S41A6725	4	3		4		3	10	5
26	22S41A6726		3	4	4	3		10	5
27	22S41A6727		5	2		3	3	10	5
28	22S41A6728	4	4	3			2	10	5
29	22S41A6729	2	3		2		3	10	5



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30	22S41A6730	3		3	2		2	10	5
31	22S41A6731		4		5	4	3	10	5
32	22S41A6732	4		3	4		3	10	5
33	22S41A6733	4	3		3	3		10	5
34	22S41A6734		3	2	3		3	10	5
35	22S41A6735	3	4		2		3	8	5
36	22S41A6736		5		5	4	4	10	5
37	22S41A6737	4		4	4		5	8	5
38	22S41A6738		4	5	4	5		10	5
39	22S41A6739	4	3		3	3		9	5
40	22S41A6740		5	3	4		3	8	5
41	22S41A6741	3	4		4		1	10	5
42	22S41A6742	4	5		5		4	9	5
43	22S41A6743	4	4		4		4	9	5
44	22S41A6744	3	3		3	4		9	5
45	22S41A6745	5	5	5			5	10	5
46	22S41A6746		2	2	2	2		10	5
47	22S41A6747	2	2	2	2			10	5
48	22S41A6748		1	1		2	1	10	5
49	22S41A6749	1		2	1	2		10	5
50	22S41A6750		5	4	5	4		10	5
51	22S41A6751		3	3		5	3	10	5
52	22S41A6752		3	4	2		3	10	5
53	22S41A6753	2	3	4	2			10	5
54	22S41A6754	4	2		2		2	10	5
55	22S41A6755		5	5	4	5		10	5
56	22S41A6756		3	4		4	4	10	5
No. of students attempted		31	47	37	41	30	37	56	56
Max Marks Question wise		5	5	5	5	5	5	10	5
Threshold 55%		2.75	2.75	2.75	2.75	2.75	2.75	5.5	2.75
No. of Students above threshold		25	40	30	29	24	29	56	56
% of Students>Target Score		80.6	85.1	81.09	70.74	80	78.38	100	100
Attainment Level		3	3	3	3	3	3	3	3
Attainment Level 1:						40% students score more than threshold			
Attainment Level 2:						50% students score more than threshold			
Attainment Level 3:						60% students score more than threshold			



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Course Outcome Mapping with each Question

CO's	Question No						Objective	Assignment
	1	2	3	4	5	6		
Course outcome - 1	y						y	y
Course outcome - 2		y					y	y
Course outcome - 3				y		y	y	y
Course outcome - 4			y				y	y
Course outcome - 5					y		y	y

Course Outcome Attainment based on Exam Questions in terms of percentage of total students when mapped to each question

CO's	Question No						Objective	Assignment
	1	2	3	4	5	6		
Course outcome - 1	3			3			3	3
Course outcome - 2		3					3	3
Course outcome - 3			3			3	3	3
Course outcome - 4							3	3
Course outcome - 5					3		3	3

Course Outcome Attainment based on Exam Questions in terms of percentage of total students when mapped to each question

CO's	Subjective	Objective	Assignment	Attainment Level
Course outcome - 1	3	3	3	3.00
Course outcome - 2	3	3	3	3.00
Course outcome - 3	3	3	3	3.00
Course outcome - 4	3	3	3	3.00
Course outcome - 5	3	3	3	3.00



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Department:		CSE(DATA SCIENCE)								
Course Outcome Attainment - Internal Assessments										
Name of the Faculty:		Mr.N.Kiran Kumar				Academic Year:		2022-23		
Branch & Section:		CSD				Exam:		Mid-2		
Course:		B.TECH				Semister:		1		
Sl.No	Roll Number	Question No.						Objective	Assignment	PPT
		1	2	3	4	5	6			
Maximum Marks		5	5	5	5	5	5	10	5	5
1	22S41A6701	3	3		2	2		9	5	5
2	22S41A6702		5	5	5	4		9	5	5
3	22S41A6703	4		4	4		3	9	5	5
4	22S41A6704		3	3		3	3	6	5	5
5	22S41A6705	3	4	3	3			8	5	5
6	22S41A6706			4	4	3	3	9	5	5
7	22S41A6707		5	4	4	4		9	5	5
8	22S41A6708	5	5	5	5			10	5	5
9	22S41A6709		4	4	3		4	9	5	5
10	22S41A6710	4		3		4	2	9	5	5
11	22S41A6711			5	4	4	4	10	5	5
12	22S41A6712		4	3	2		3	10	5	5
13	22S41A6713	3	2		2	3		10	5	5
14	22S41A6714			3	3	2	2	10	5	5
15	22S41A6715		5	5	5	5		10	5	5
16	22S41A6716	5	5			2	3	10	5	5
17	22S41A6717		2		4	3	3	10	5	5
18	22S41A6718	4	4	3	4			9	5	5
19	22S41A6719			2	3	3	3	10	5	5
20	22S41A6720	3	4	3		3		10	5	5
21	22S41A6721		3		4	2	3	10	5	5
22	22S41A6722		3	4	3		3	10	5	5
23	22S41A6723			5	4	4	4	10	5	5
24	22S41A6724	4	3	3		4		9	5	5
25	22S41A6725	3		4	4	3		8	5	5
26	22S41A6726		3	2	2	3		8	5	5
27	22S41A6727	4	3	3	3			8	5	5
28	22S41A6728		4	4	4		3	9	5	5
29	22S41A6729		3	4	3	3		9	5	5
30	22S41A6730	2		2		3	3	7	5	5



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31	22S41A6731		4	3	5	3		7	5	5
32	22S41A6732	4	4		4	4		8	5	5
33	22S41A6733	4	5	3		2		8	5	5
34	22S41A6734	3		2	2	3		9	5	5
35	22S41A6735		2	1	1		1	10	5	5
36	22S41A6736		5	4	2	3		8	5	5
37	22S41A6737	4		4		4	4	9	5	5
38	22S41A6738		5		3	3	5	9	5	5
39	22S41A6739		3	4	2	2		10	5	5
40	22S41A6740	5	2	3			3	10	5	5
41	22S41A6741		3	3	2	2		10	5	5
42	22S41A6742	4		3	3		3	9	5	5
43	22S41A6743		4	3	4	3		9	5	5
44	22S41A6744	3		3	3		2	9	5	5
45	22S41A6745		3	3		5	4	9	5	5
46	22S41A6746			3	3	2	2	10	5	5
47	22S41A6747	2		2		2	4	10	5	5
48	22S41A6748		4	2	3	1		10	5	5
49	22S41A6749	2		2		4	2	9	5	5
50	22S41A6750		5		5	5	5	9	5	5
51	22S41A6751		4	3	3	3		9	5	5
52	22S41A6752	2		2	3		3	9	5	5
53	22S41A6753		4	4	3	3		9	5	5
54	22S41A6754	5		5		3	4	9	5	5
55	22S41A6755		4	5	5	3		9	5	5
56	22S41A6756		3	4	4		4	8	5	5
No. of students attempted		24	38	48	43	41	30	56	56	56
Max Marks Question wise		5	5	5	5	5	5	10	5	5
Threshold 55%		2.75	2.75	2.75	2.75	2.75	2.75	5.5	2.75	2.75
No. of Students above threshold		20	34	39	34	31	24	56	56	56
% of Students>Target Score		83.34	89.48	81.25	79.07	75.61	80	100	100	100
Attainment Level		3	3	3	3	3	3	3	3	3



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Attainment Level	1:			40% students score more than threshold
Attainment Level	2:			50% students score more than threshold
Attainment Level	3:			60% students score more than threshold

Course Outcome Mapping with each Question

CO's	Question No						Objective	Assignment
	1	2	3	4	5	6		
Course outcome - 1	y						y	y
Course outcome - 2		y					y	y
Course outcome - 3				y		y	y	y
Course outcome - 4			y				y	y
Course outcome - 5					y		y	y

Course Outcome Attainment based on Exam Questions in terms of percentage of total students when mapped to each question

CO's	Question No						Objective	Assignment
	1	2	3	4	5	6		
Course outcome - 1	3			3			3	3
Course outcome - 2		3					3	3
Course outcome - 3			3			3	3	3
Course outcome - 4							3	3
Course outcome - 5					3		3	3

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Course Outcome Attainment based on Exam Questions in terms of percentage of total students when mapped to each question

CO's	Subjective	Objective	Assignment	Attainment Level
Course outcome - 1	3	3	3	3
Course outcome - 2	3	3	3	3
Course outcome - 3	3	3	3	3
Course outcome - 4	3	3	3	3
Course outcome - 5	3	3	3	3

VAAGESWARI COLLEGE OF ENGINEERING			
Department:		CSE(DATA SCIENCE)	
Course Outcome Attainment External Examination			
Name of the Faculty:	Mr.N.Kiran Kumar	Academic Year:	2022-23
Branch & Section:	CSD	Exam:	External
Course:	B.TECH	Semister:	1
S.NO.	HALLTICKET NO	TOTAL(Max. Score:60)	
1	22S41A6701	39	
2	22S41A6702	42	
3	22S41A6703	32	
4	22S41A6704	47	
5	22S41A6705	38	
6	22S41A6706	59	
7	22S41A6707	41	
8	22S41A6708	32	
9	22S41A6709	29	
10	22S41A6710	32	
11	22S41A6711	25	
12	22S41A6712	52	
13	22S41A6713	27	
14	22S41A6714	45	
15	22S41A6715	43	
16	22S41A6716	38	
17	22S41A6717	31	
18	22S41A6718	43	
19	22S41A6719	25	
20	22S41A6720	25	
21	22S41A6721	38	



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22	22S41A6722	33
23	22S41A6723	35
24	22S41A6724	56
25	22S41A6725	44
26	22S41A6726	47
27	22S41A6727	34
28	22S41A6728	45
29	22S41A6729	44
30	22S41A6730	54
31	22S41A6731	25
32	22S41A6732	51
33	22S41A6733	47
34	22S41A6734	49
35	22S41A6735	34
36	22S41A6736	33
37	22S41A6737	52
38	22S41A6738	58
39	22S41A6739	31
40	22S41A6740	32
41	22S41A6741	58
42	22S41A6742	55
43	22S41A6743	44
44	22S41A6744	28
45	22S41A6745	36
46	22S41A6746	27
47	22S41A6747	44
48	22S41A6748	60
49	22S41A6749	0
50	22S41A6750	59
51	22S41A6751	47
52	22S41A6752	0
53	22S41A6753	44
54	22S41A6754	52
55	22S41A6755	49
56	22S41A6756	33
No. of students who attempted the subject		56
Max. Marks		60
Thresold 40%		24



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No. of students who scored more than the target score	46
Percentage of students who scored more than target score	82.14
Overall External Attainment level	3

Attainment Level	1:	40% students score more than threshold
Attainment Level	2:	50% students score more than threshold
Attainment Level	3:	60% students score more than threshold


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CO attainment level for courses other than Theory:

a) Practical's:

Continuous Internal Evaluation: The internal evaluation is based on session wise performance of experiment and viva voice, observation, record and internal examination. The final internal marks are considered for CIE and CO Level for CIE attainment is decided upon the percentage of students who score more than 35% of the maximum internal marks i.e., 14 out of 40 is used to decide the attainment level and is uniform for all CO's.

Semester End University Examination Evaluation (SEE):

SEE Lab Exam is evaluated for 60 Marks. In SEE of the Lab, % of students who score over 40% of the maximum marks i.e., 21 out of 60 marks, is used to decide the CO attainment level and is uniform for all CO's.

b) Real-Time (or) Field-based Research Project:

The assessment is based on internal evaluation. The marks obtained is used to decide the % of students who scored more than 40% of maximum marks and this % is used for determining corresponding CO attainment level. This attainment level is constructed as uniform for all CO's of the course.

c) Industry oriented Mini-project(or) Paper presentation in reputed journal (or) Internship:

For Industry oriented Mini Project, the assessment is based only on External Evaluation. The marks obtained in Industry Oriented Mini Project is used to decide the % of students who secured more than 40 % of maximum marks, and this % is used for determining corresponding CO attainment level. This Attainment level is constructed as uniform to all Co's of the course.

d) Project:

Continuous Internal Evaluation:

The internal marks for project (40) are the total of marks allotted in project review, final presentation and by internal project guide. The final internal marks are considered for CIE, and CO Level for CIE attainment is decided upon the percentage of students who score more than 40% of the maximum internal Marks. i.e., 14 out of 40 is used to decide the CO attainment level and is uniform for all CO's.


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Semester End University Examination Evaluation (SEE):

The external evaluation is by award of Grade (Excellent/Very Good/Satisfactory /Poor). These grades are considered for SEE, and CO level for SEE attainment is decided upon the percentage of students who got Excellent/Very Good/Good to the number of students appeared is used to decide the CO attainment level and is uniform for all COs. The average value of the CO levels for the course are then used for mapping the PO attainments, using the array of target PO values for the course.

Attainment of Program Outcomes and Program Specific Outcomes:


Direct assessment of POs and PSOs for a course is obtained by mapping the respective CO value of Course Outcome attainment with the mapping of the target or expected POs and PSOs for the particular course.

The procedure adapted for calculating the attainment of Course Outcomes for a Theory course is described with an example for the course **Basic Electric Engineering**.

The CO values arrived from CIE and SEE for the course **Basic Electric Engineering** for academic year 2022-23 is

Table: CO values of Basic Electric Engineering

	CO1	CO2	CO3	CO4	CO5
Basic Electric Engineering	2.67	2.83	2.94	2.97	2.94


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The Mapping Pos for particular COs for the course **Basic Electric Engineering** are given below

Table: CO- PO Mapping of **Basic Electric Engineering** course

COURSE OUTCOMES AND PROGRAM OUTCOMES MAPPING														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Course outcome - 1	1	2	2	2	2	2	2	-	-	2	-	-	-	-
Course outcome - 2	1	1	2	1	1	2	1	-	-	2	-	-	-	-
Course outcome - 3	1	2	1	2	2	2	2	-	-	1	-	-	1	2
Course outcome - 4	2	2	2	2	2	2	2	-	-	2	-	-	-	-
Course outcome - 5	2	1	2	2	2	2	2	-	-	2	-	-	-	-
Average Pos	1.4	1.6	1.8	1.8	1.8	2	1.8			1.8			1	2
PO ATTAINMENT	2.1	2.48	2.68	1.72	1.72	1.72	1.72	-	-	1.72	-	-	2.87	1.91

Handwritten signature
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The complete PO Attainment mapping for the course **Basic Electric Engineering** is shown below.

Table: PO Attainment from course outcome

COURSE OUTCOMES AND PROGRAM OUTCOMES MAPPING														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Course outcome - 1	2	3	3	-	2	-	-	-	-	2	-	-	-	-
Course outcome - 2	3	3	3	-	1	-	-	-	-	2	-	-	-	-
Course outcome - 3	2	2	3	-	2	-	-	-	-	1	-	-	1	2
Course outcome - 4	2	3	2	-	2	-	-	-	-	2	-	-	-	-
Course outcome - 5	2	2	3	-	2	-	-	-	-	2	-	-	-	-
Average Pos	1.4	1.6	1.8	-	1.8	-	-			1.8			1	2
PO ATTAINMENT	2.1	2.48	2.68	-	1.72	-	-	-	-	1.72	-	-	2.87	1.91

The PO/PSO attainment values so obtained from their direct component for the course. The direct components for all the courses are obtained similarly and tabulated. The average for each PO/PSO gives the values attained directly.

Indirect Components:

The PO/ PSOs are attained indirectly by taking different surveys. These surveys are also having equal weightage for overall PO/PSO attainment.

Frequency of Data Collection:

Assessment Tool	Frequency of data collection
Program Exit Survey	Once a year
Employer Survey	Once a year
Alumni Survey	Once a year



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Indirect Assessment Tools:

Alumni Survey: A feedback is collected on POs & PSOs from alumni students. It contributes towards the weightage of PO and PSO attainment. This survey is conducted by Alumni coordinator with the passed out students. Alumni coordinator collects both Alumni feedback forms filled by passed out student.

Employer Feedback Survey: A feedback is collected on Vision & Mission, PEOs, and POs & PSOs. It is an indirect assessment tool which contributes towards the weightage of PO and PSOs. It is conducted after one year of service completed by the graduates from joining those respective organizations.

Program Exit Survey: The Program graduate exit survey is collected at the end of the program. The objective of the survey is to know the level of confidence of each POs & PSOs that a graduate possess by the end of the program.


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Program Outcomes

B.TECH 1 YEAR I SEMESTER

Sl.No.	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	Engineering Chemistry	1.5	1.25	1.5	1.75	1.5	1.25	-	-	1.25	2	1.25	1.75
2	Programming for Problem Solving	1.75	2.1	-	2	-	1.25	-	-	1.25	-	1.5	1.75
3	Basic Electrical Engineering	2.1	2.48	2.68	-	1.75	-	-	-	1.25	1.75	-	-
4	Computer Aided Engineering Graphics	2.3	1.75	-	1.25	1.5	2.1	1.75	-	2.42	1.75	1.25	1.25
5	Elements of Computer Science & Engineering	2.1	2.48	2.68	2.3	-	1.25	1.25	1.5	-	1.75	-	2.42
6	Engineering Chemistry Laboratory	2.1	2.48	-	2.48	2.68	1.75	2.48	2.68	1.25	-	2.68	2.3
7	Programming for Problem Solving Laboratory	1.75	-	2.68	1.25	2.48	-	2.3	2.1	-	2.68	2.3	-
8	Basic Electrical Engineering Laboratory	-	2.48	2.68	2.3	2.1	-	2.68	2.3	1.25	2.48	2.68	2.3


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CO and PSO Average for the academic Year 2022-2023

B.TECH I YEAR I SEMESTER		PSO	
Sl.No.	Subject	PSO1	PSO2
1	Engineering Chemistry	1.5	1.25
2	Programming for Problem Solving	-	2.1
3	Basic Electrical Engineering	2.1	1.75
4	Computer Aided Engineering Graphics	2.3	-
5	Elements of Computer Science & Engineering	2.1	1.90
6	Engineering Chemistry Laboratory	-	2.3
7	Programming for Problem Solving Laboratory	1.75	2.48
8	Basic Electrical Engineering Laboratory	1.25	2.15


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