



Shiksha Mandal's

BAJAJ INSTITUTE OF TECHNOLOGY, PIPRI, WARDHA

CRITERION-II

Metric: 2.6.2

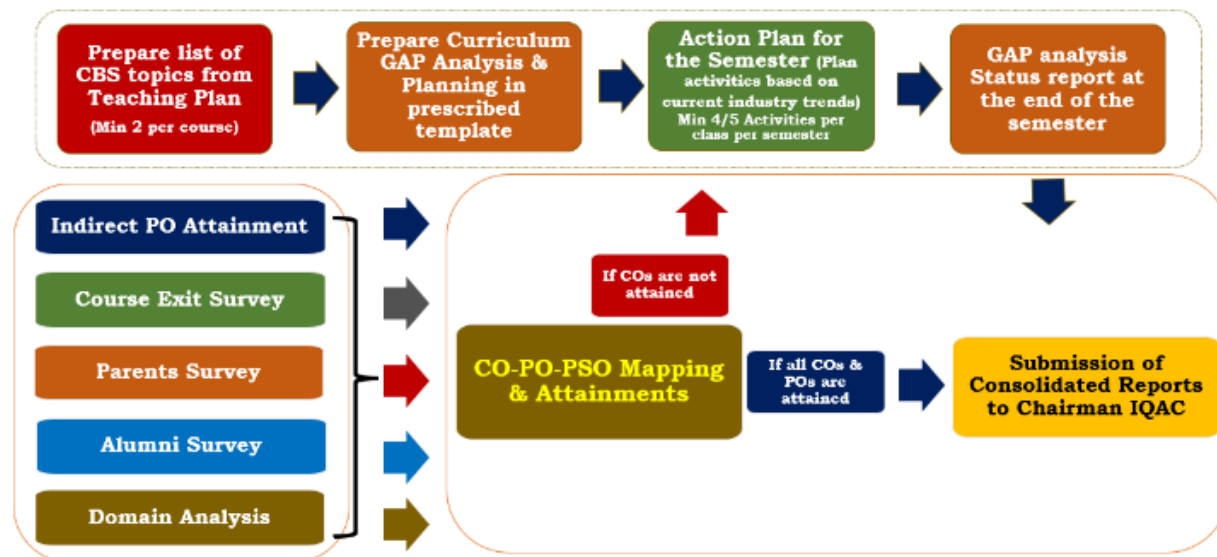
Attainment of POs and COs are evaluated

2.6.2

Attainment of POs and COs are evaluated.

Bajaj Institute of Technology believes in outcome-based education since its inception. The first batch is passed out in 2020-21. Due to pandemic and online nature of content delivery, evaluation of CO-PO attainment is started from 2020-21 (For 2019-20 Batch).

Process Flow:



Method of Measuring Attainment of CO:

Course CO attainment is measured based on students scores and set CO targets.

The CO targets are set by IQAC for all the courses in the program based on performance of students in internal and external examinations such as Continuous Assessment (CA), Mid Semester Examinations (MSE) and End Semester Examination (ESE). If the targets are achieved then all the COs are attained. If the set target is not achieved ($\geq 30\%$ of set target), then the department prepares an action plan. These courses also have a priority while planning and preparing curriculum GAP analysis in subsequent years.

For evaluating CO attainments ERP portal (R-Work) is used for all the courses.

Following table shows Assessment tools, criterion and process.

S. No	Assessment Tool	Assessment Criterion	Process for data collection
1.	Continuous Assessment (CA-I)	CA-I is based on defined assessment parameters. Its assessment is based on defined rubrics for various parameters.	Evaluation of rubrics-based parameters and the score of the students.
2.	Continuous Assessment (CA-II)	CA-II is based on defined assessment parameters. Its assessment is based on defined rubrics for various parameters	Evaluation of rubrics-based parameters and the score of the students.

3.	Mid Semester Examination (MSE)	MSE is based on first two/three units of the syllabus. Three Questions are asked based on the syllabus.	Evaluation of the answer sheets and the score of the students out of 20.
4.	End Semester Examination (ESE)	ESE is as per affiliating university schedule and on complete syllabus.	Marks scored by the students out of 80.
5.	Lab Assessment CA-I & II and Oral Examination	CA-I and II is based on defined assessment parameters for laboratory work. Its assessment is based on defined rubrics for various parameters.	Evaluation of rubrics-based parameters and the score of the students.
		Practical oral examination is as per affiliating university schedule and on complete syllabus.	Evaluation of rubrics-based parameters and the score of the students.
6.	Project/Seminar /Mini Project	Review seminars are conducted for continuous assessment and evaluation.	Evaluation by internal and external examiners. Internal evaluation is based on defined rubrics.

Method of Measuring Attainment of PO and PSO:

PO attainment levels are evaluated based on Direct Attainment Method and Indirect attainment method.

	Assessment & Evaluation Method	Assessment and Evaluation Tool	Source	Frequency
PO/ PSO	Direct Assessment (80 %)	Internal Assessment (CA)	CO Attainment Level	Throughout the Semester
		Mid Semester & End Semester Examinations		After results declaration
	Indirect Assessment (20%)	Course Exit Survey	Attainment Level from the survey form	End of Academic Year
		Indirect Attainment PO		End of Semester
		Parents Feedback		End of Semester

Internal Quality Assurance Cell reviews all COs of the courses which are relevant to corresponding POs. The task is to review the course outcome assessment results towards PO assessment for each course and to draw conclusion on how the program outcomes are attained. CO-PO attainment levels are thoroughly viewed and action taken report is prepared and is submitted to the IQAC for further comments and necessary action. Based on the suggestions, department prepares action plan in the subsequent year and submits the same to IQAC Chairman for approval.

Example:

The PO and PSO attainments are calculated for complete batch of students which progresses through all the courses of a particular program including the project work. The attainment is calculated based upon the correlation level, i.e., low-moderate-high, of a particular course/ CO/ activity with respect to the PO or PSO in the scale of 1-3.

Direct PO attainment is calculated from CO attainment of the courses addressing corresponding PO.

It is decided to have more indirect tools from 2023-24. These are

- Domain wise analysis and attainment
- Alumni Survey
- Employer Feedback

	Assessment & Evaluation Method	Assessment and Evaluation Tool	Source	Frequency
PO/ PSO	Direct Assessment (80%)	Internal Assessment (CA)	CO Attainment Level	Throughout the Semester
		Mid Semester & End Semester Examinations		After results declaration
	Indirect Assessment (20%)	Course Exit Survey	Attainment Level from the survey form	End of Academic Year
		Indirect Attainment PO		End of Semester
		Parents Feedback		End of Semester
		Domain Analysis		End of Academic Year
		Alumni Survey		End of Academic Year
		Employer Survey		End of Academic Year

The method is as follows:

1. Define independent and dependent tools along with assessment method.

Sr. No.	Tool Name	Tool Type	Tool Applicable for CO Attainment	Tool Applicable for Publish Option	Whether End Semester Applicable?	Tool Dependency	Tool Assessment Method	Action
1	CA (ACTIVITY_02)-THEORY	INTERNAL TOOL	YES	YES	NO	INDEPENDENT TOOL	QUESTION WISE ASSESSMENT	Update Delete
2	CA (ACTIVITY_02)-THEORY	INTERNAL TOOL	YES	YES	NO	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	Update Delete
3	SELF LEARNING, THEORY	INTERNAL TOOL	YES	YES	NO	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	Update Delete
4	CA - THEORY	-	-	YES	NO	DEPENDENT TOOL	CA (ACTIVITY_02)-THEORY, CA (ACTIVITY_02)-THEORY, SELF LEARNING, THEORY	Update Delete
5	CA - I- PRACTICAL	INTERNAL TOOL	YES	YES	NO	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	Update Delete
6	CA - II- PRACTICAL	INTERNAL TOOL	YES	YES	NO	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	Update Delete
7	CA - I- PRACTICAL	-	-	YES	NO	DEPENDENT TOOL	CA - I- PRACTICAL, CA - II- PRACTICAL	Update Delete
8	MID SEMESTER EXAMINATION (HSE)	EXTERNAL TOOL	YES	YES	YES	INDEPENDENT TOOL	DIRECT ASSESSMENT (UNIVERSITY MARKS BASED ASSESSMENT)	Update Delete
9	END SEMESTER EXAMINATION (ESE)	EXTERNAL TOOL	YES	YES	YES	INDEPENDENT TOOL	DIRECT ASSESSMENT (UNIVERSITY MARKS BASED ASSESSMENT)	Update Delete

2. Set attainment level as 40, 50 and 60 as level 1, level 2 and level 3 respectively. (Common for all the courses in that AY.

Tool Attainment Level

Academic Year: 2022-23

Sr. No.	Tool Name	Tool Type	Tool Dependency	Tool Assessment Method	Attainment Levels			Action
					Level 1	Level 2	Level 3	
1	CA-ACTIVITY_01-THEORY	INTERNAL TOOL	INDEPENDENT TOOL	QUESTION WISE ASSESSMENT	40	50	60	Update
2	CA-ACTIVITY_02-THEORY	INTERNAL TOOL	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	40	50	60	Update
3	SELF LEARNING_ THEORY	INTERNAL TOOL	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	40	50	60	Update
4	CA_ THEORY	-	DEPENDENT TOOL	CA-ACTIVITY_01-THEORY;CA-ACTIVITY_02-THEORY;SELF LEARNING_ THEORY	NA	NA	NA	Update
5	CA-I- PRACTICAL	INTERNAL TOOL	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	40	50	60	Update
6	CA-II- PRACTICAL	INTERNAL TOOL	INDEPENDENT TOOL	RUBRICS BASED ASSESSMENT (RUBRICS WISE CO)	40	50	60	Update
7	CA- PRACTICAL	-	DEPENDENT TOOL	CA-I- PRACTICAL;CA-II- PRACTICAL	NA	NA	NA	Update
8	END SEMESTER EXAMINATION (ESE)	EXTERNAL TOOL	INDEPENDENT TOOL	DIRECT ASSESSMENT (UNIVERSITY MARKS BASED ASSESSMENT)	40	50	60	Update
9	END SEMESTER EXAMINATION (ESE)	EXTERNAL TOOL	INDEPENDENT TOOL	DIRECT ASSESSMENT (UNIVERSITY MARKS BASED ASSESSMENT)	40	50	60	Update

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3. Complete the course PO mapping of all the courses.

Course - PO Mapping Index

Academic Year: 2021-22

Program: UG IN COMPUTER ENGINEERING

Degree Level: UNDER GRADUATE

Department: COMPUTER ENGINEERING

Class: FOURTH YEAR

Semester: SEMESTER I

Division: A

Course: OPEN ELECTIVE - X (A) BLOCKCHAIN TECHNOLOGY (BTCOE704A)

Level of Co-relation: No Co-relation: 0 Low Co-relation: 1 Medium Co-relation: 2 High Co-relation: 3

Sr. No.	CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	BTCOE704A.1	-	1	1	1	-	-	-	-	-	-	-	-	2	2
2	BTCOE704A.2	1	2	2	2	2	-	-	-	-	-	-	-	2	2
3	BTCOE704A.3	-	1	1	1	-	-	-	-	-	-	-	-	2	2
4	BTCOE704A.4	-	2	2	2	2	-	-	-	-	1	-	-	3	2
5	BTCOE704A.5	1	2	2	2	2	-	-	-	-	-	-	-	3	3

Course PO Matrix

Sr. No.	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	BTCOE704A	OPEN ELECTIVE - X (A) BLOCKCHAIN TECHNOLOGY	1.00	1.60	1.60	1.60	2.00	-	-	-	-	1.00	-	-	2.40	2.20

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4. Assign CO targets for all the independent tools for the course.

CO Targets

Academic Year: 2022-23

Program: UG IN COMPUTER ENGINEERING

Degree Level: UNDER GRADUATE

Department: COMPUTER ENGINEERING

Class: FOURTH YEAR

Semester: SEMESTER I

Division: A

Course: OPEN ELECTIVE - X (A) BLOCKCHAIN TECHNOLOGY (BTCOE704A)

Level of Co-relation: No Co-relation: NA Low Co-relation: 1 Medium Co-relation: 2 High Co-relation: 3

Internal Tool Information

Sr. No.	Tool Name	BTCOE704A.1	BTCOE704A.2	BTCOE704A.3	BTCOE704A.4	BTCOE704A.5
1	CA-ACTIVITY_01-THEORY	2	2	NA	NA	NA
2	SELF LEARNING_ THEORY	NA	NA	NA	2	2
3	CA-ACTIVITY_02-THEORY	NA	2	2	NA	NA
Average CO Target		2.00	2.00	2.00	2.00	2.00

Internal Tool Weightage (%) * 20

External Tool Information

Sr. No.	Tool Name	BTCOE704A.1	BTCOE704A.2	BTCOE704A.3	BTCOE704A.4	BTCOE704A.5
1	END SEMESTER EXAMINATION (ESE)	2	2	NA	NA	NA
2	END SEMESTER EXAMINATION (ESE)	3	2	2	2	2
Average CO Target		2.50	2.00	2.00	2.00	2.00

External Tool Weightage (%) * 80

Overall Course CO Target

Sr. No.	Tool Type	BTCOE704A.1	BTCOE704A.2	BTCOE704A.3	BTCOE704A.4	BTCOE704A.5	Overall Target
1	INTERNAL	2.00	2.00	2.00	2.00	2.00	2.00
2	EXTERNAL	2.50	2.00	2.00	2.00	2.00	2.30
3	OVERALL TARGET	2.40	2.00	2.00	2.00	2.00	2.08

5. Enter Tool Targets and marks

RWork BITW Admin

Tool - Evaluation & Attainment

CA (ACTIVITY_01)-THEORY Marks Note: * Indicates Mandatory Fields

Academic Year 2021-22 Program UG IN COMPUTER ENGINEERING
 Degree Level UNDER GRADUATE Department COMPUTER ENGINEERING
 Class FOURTH YEAR Semester SEMESTER I
 Division A Course OPEN ELECTIVE - X (A) BLOCKCHAIN TECHNOLOGY (BTCOE704A)

Tool Maximum Marks 10 No. of Questions 1
 Date of Exam 30-10-2021 Minimum Passing Marks

Target Level (% Target Marks for CO Attainment) [Import The Details](#)

Roll No.	Student Code	PRN	Name of Student	Linked CO	Max. Marks for Question	Que. No./ Total Marks
1	181CO11001	40464920181124510001	ASATI AKSHAT DINESH	BTCOE704A.1, BTCOE704A.2	10	Q1
2	181CO11002	40464920181124510003	AWARI JAYANT BHIMRAD			
3	181CO11003	40464920181124510004	BARDHIYA HIMANSHI KAILAS			
4	181CO11004	40464920181124510005	BHAGAT ASHVAJEET ARUNRAO			
5	181CO11005	40464920181124510006	BHOYAR HARSHAL SUDHAKAR			

6. View CO attainments of all the assign courses in AY.

Course CO Attainment Note: * Indicates Mandatory Fields

Academic Year 2021-22 Program UG IN COMPUTER ENGINEERING
 Degree Level UNDER GRADUATE Department COMPUTER ENGINEERING
 Class FOURTH YEAR Semester SEMESTER I
 Division A Course OPEN ELECTIVE - X (A) BLOCKCHAIN TECHNOLOGY (BTCOE704A)

Tier*

CO Attainment CO Attainment With Target

Internal Tools

Sr. No.	Tools	BTCOE704A.1	BTCOE704A.2	BTCOE704A.3	BTCOE704A.4	BTCOE704A.5
1	CA (ACTIVITY_01)-THEORY	0	0	NA	NA	NA
2	SELF LEARNING THEORY	NA	NA	NA	3	3
3	CA (ACTIVITY_02)-THEORY	NA	2	NA	NA	NA
INTERNAL TOOL ATTAINMENT		0.00	1.00	2.00	3.00	3.00

Internal Tool Weightage (%)

External Tools

Sr. No.	Tools	BTCOE704A.1	BTCOE704A.2	BTCOE704A.3	BTCOE704A.4	BTCOE704A.5
1	END SEMESTER EXAMINATION (ESE)	1	1	NA	NA	NA
2	END SEMESTER EXAMINATION (ESE)	3	3	3	3	3
EXTERNAL TOOL ATTAINMENT		2.00	2.00	3.00	3.00	3.00

External Tool Weightage (%)

Overall Course CO Attainment

Sr. No.	Tool Type	BTCOE704A.1	BTCOE704A.2	BTCOE704A.3	BTCOE704A.4	BTCOE704A.5	Overall
1	Internal	0.00	1.00	2.00	3.00	3.00	1.85
2	External	2.00	2.00	3.00	3.00	3.00	2.60
Overall		1.60	1.80	2.80	3.00	3.00	2.44

7. View Direct PO attainment of a batch.

Direct PO Attainment

Direct PO Attainment Note: * Indicates Mandatory Fields

Program* Batch*

Include First Year Courses*

Tier*

Attainment Target

PO Attainment Information

8. Create indirect tools (Course Exit Survey, Parents Feedback and Indirect PO attainment) for PO attainment.

Indirect Target & Attainment

Indirect Target & Attainment Note : * Indicates Mandatory Fields

Program* Batch*

Level of Co-relation:
 No Co-relation: NA Low Co-relation: 1 Medium Co-relation: 2 High Co-relation: 3

Indirect Attainment **Indirect Target**

Sr. No.	Method Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
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9. PO attainment.

3.3.2.C. PO/PSO Attainment

Academic Year Program

Graduating Batch: 2019-23

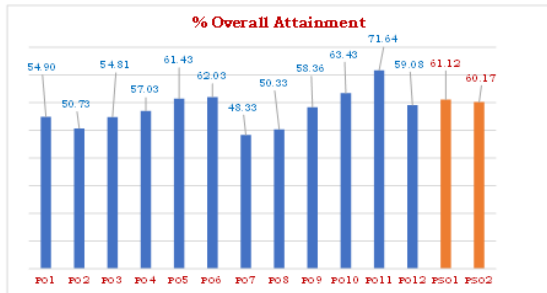
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Sr. No.	Course	Course Code	Class	Overall CO Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	ENGINEERING MATHEMATICS	EEEN001A	1ST SEM	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	ENGINEERING PHYSICS	EEEN002A	1ST SEM	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
3	ELECTRICAL MACHINES	EEEN003A	3RD SEM	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
4	POWER SYSTEMS	EEEN004A	3RD SEM	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
5	ELECTRICAL DESIGN AND DRAWING	EEEN005A	3RD SEM	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

After CO attainment levels are tabulated for every course in the semester corresponding POs are evaluated



Semester	Name of the Course/Subject	Course CO Attainment	Mapping of all the Courses with POs & PSOs													
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
III Semester																
1	ENGINEERING MATHEMATICS-III	2.72	2.25	2.00	1.00											1.50
2	MATERIALS SCIENCE AND METALLURGY	2.71	1.67	1.50	1.67	2.00	1.80	1.00	1.67	1.00	1.00	1.00			2.00	2.00
3	FLUID MECHANICS	2.61	2.71	3.00	1.33	1.33	1.00							1.00	1.71	1.00
4	MACHINE DRAWING AND CAD	2.23	1.67	1.25			1.00					2.17	1.33	1.00	2.17	1.00
5	THERMODYNAMICS	2.52	1.25	1.25	1.00										1.40	1.40
6	MATERIALS SCIENCE AND METALLURGY LAB	2.66	1.60	1.40	1.80	2.00	1.80	1.00	1.67	1.00	1.00	1.00			2.00	2.00
7	FLUID MECHANICS LAB	2.42	1.00	1.00	1.00	3.00	1.00							1.00	1.29	2.00
8	MACHINE DRAWING AND CAD LAB	2.66	1.67	1.25			1.00					2.17	1.33	1.00	2.17	1.00
9	FIELD TRAINING /INTERNSHIP/INDUSTRIAL TRAINING I	2.66		1.00	1.00	2.00			1.00			3.00	2.50		2.50	2.50
IV Semester																
10	MANUFACTURING PROCESSES-I	2.35	1.50	1.33	1.00		1.00	1.00				1.00		1.00	1.60	1.60
11	THEORY OF MACHINES-I	1.93	1.00	1.00		1.80								2.60	1.33	2.25
12	STRENGTH OF MATERIALS	2.20	1.00	1.40	2.00	1.80		1.00			1.00			2.20	3.00	1.40
13	NUMERICAL METHODS IN MECHANICAL ENGINEERING	1.67	3.00	3.00		1.00	3.00								2.00	2.00
14	INTERPERSONAL COMMUNICATION SKILL& SELF DEVELOPMENT	2.70									1.00	1.00	2.00	3.00	2.00	1.00
15	MANUFACTURING PROCESSES LAB-I	2.66	1.33	1.00		3.00	1.00		1.00		1.00	1.83		1.00	1.00	1.00
16	THEORY OF MACHINES LAB - I	2.34	1.00	1.00		2.25								2.50	1.50	2.50
17	STRENGTH OF MATERIALS LAB	2.02	1.00	1.00	2.00	2.00		1.00			1.00			2.25	3.00	1.25
18	NUMERICAL METHODS LAB	2.66	3.00	3.00		1.00	3.00								2.00	2.00
V Semester																
19	HEAT TRANSFER	0.63	2.67	2.17	3.00	1.50	1.33		2.00		1.00				1.50	1.67
20	APPLIED THERMODYNAMICS-I	2.27	1.00	1.67	1.00										1.20	1.20
21	MACHINE DESIGN-I	2.48	1.83	1.67	2.00	1.00		1.20		1.00		1.00		1.00	2.17	1.50
22	THEORY OF MACHINES-II	2.29	2.00	2.67	1.00	2.00	2.00		1.00			2.00			2.60	1.50
23	METROLOGY AND QUALITY CONTROL	2.49	1.00	2.00	2.00	3.00	2.00	2.33		1.00	3.00	3.00		2.50	2.00	1.50
24	HEAT TRANSFER LAB	1.09	2.67	3.00		3.00	2.00		2.00						1.33	2.00
25	APPLIED THERMODYNAMICS LAB	1.01	1.33	1.33	1.00	1.75	1.00	1.00				2.00		2.00	2.00	2.00
26	MACHINE DESIGN PRACTICE - I	0.37	2.00	2.00	2.00	1.40		1.00	1.33	1.00	1.50	2.00	2.00	1.50	2.43	1.43
27	THEORY OF MACHINES LAB-II	2.38	2.25	2.50	1.00	2.50	2.50		2.00					3.00	1.00	1.00
28	FIELD TRAINING /INTERNSHIP/INDUSTRIAL TRAINING II	2.77		1.00	1.00			2.00		1.00				3.00	2.50	2.50
VIII Semester																
53	FUNDAMENTALS OF AUTOMOTIVE SYSTEMS	2.65	1.33	1.20	3.00	2.60	3.00	3.00	2.33		2.33	2.67	2.00		1.83	1.67
54	NON-CONVENTIONAL ENERGY RESOURCES	0.90	1.67	2.00		2.00			2.50						1.33	1.67
55	PROJECT STAGE-II OR INTERNSHIP AND PROJECT	2.75	1.00	1.00	2.00	1.50	1.67	1.33	1.50	1.00		2.00		1.00	2.50	2.00
		Overall Attainment	1.65	1.52	1.64	1.71	1.84	1.86	1.45	1.51	1.75	1.90	2.15	1.77	1.83	1.91
		% Overall Attainment	54.90	50.73	54.81	57.03	61.43	62.03	48.33	50.33	58.36	63.43	71.64	59.08	61.12	60.17



Batch 2019-20	Average PO Attainment	57.68
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IQAC Coordinator
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