

NATIONAL BOARD OF ACCREDITATION

Data Capturing Points of the Program Applied for NBA Accreditation– Tier I/II UG (Engineering) Institute Programs

Program Name : Mechanical Engineering	Discipline : Engineering & Technology
Level : Under Graduate	Tier : 1
Application No : 10451	Date of Submission : 03-04-2025

PART A- Profile of the Institute

A1.Name of the Institute : Chitkara University, Punjab	
Year of Establishment : 2010	Location of the Institute:
A2. Institute Address :Chandigarh-Patiala National Highway, Rajpura	
City:Patiala	State:Punjab
Pin Code:140401	Website:www.chitkara.edu.in
Email:cuaqac@chitkara.edu.in	Phone No(with STD Code):-
A3. Name and Address of the Affiliating University (if any):	
Name of the University :	City:
State :	Pin Code:
A4. Type of the Institution : University	
A5. Ownership Status :	

A6. Details of all Programs being Offered by the Institution:

- No. of UG programs: 8
- No. of PG programs: 10

Table No. A6.1: List of all programs offered by the Institute.

Sr.No.	Discipline	Level of program	Name of the program	Year of Start	Year of Closed	Name of The Department
1	Computer Application	PG	Master of Computer Application	2011	--	Computer Application
2	Engineering & Technology	UG	Civil Engineering	2018	--	Civil Engineering
3	Engineering & Technology	PG	Computer Science and Engineering	2011	--	Computer Science and Engineering
4	Engineering & Technology	UG	Computer Science and Engineering	2011	--	Computer Science and Engineering
5	Engineering & Technology	UG	Computer Science and Engineering (Artificial Intelligence)	2021	--	Computer Science and Engineering (Artificial Intelligence)
6	Engineering & Technology	UG	Electrical Engineering	2016	--	Electrical Engineering
7	Engineering & Technology	UG	Electronics & Communication Engineering	2011	--	Electronics and Communication Engineering
8	Engineering & Technology	PG	Electronics & Communication Engineering	2011	--	Electronics and Communication Engineering
9	Engineering & Technology	UG	Mechanical Engineering	2011	--	Mechanical Engineering

10	Engineering & Technology	PG	Mechanical Engineering	2011	--	Mechanical Engineering
11	Engineering & Technology	UG	Mechatronics Engineering	2018	--	Mechatronics Engineering
12	Management	PG	Master of Business Administration	2011	--	Management
13	Pharmacy	PG	Pharm D	2014	--	Pharmacy
14	Pharmacy	PG	Pharmaceutics	2011	--	Pharmacy
15	Pharmacy	PG	Pharmacology	2013	--	Pharmacy
16	Pharmacy	UG	Pharmacy	2011	--	Pharmacy
17	Pharmacy	PG	Pharmacy Practice	2013	--	Pharmacy
18	Pharmacy	PG	Regulatory Affairs	2020	--	Pharmacy

A7. Programs to be considered for Accreditation vide this Application:

Table No. A7.1: List of programs to be considered for accreditation.

Name of the Department	Having Allied Departments	Name of the Program	Program Level
Electronics and Communication Engineering	No	Electronics & Communication Engineering	UG
Mechanical Engineering	No	Mechanical Engineering	UG

Table No. A7.2: Allied Department(s) to the Department of the program considered for accreditation as above.
Cluster ID. Name of the Department (in table no. A7.1) Name of allied Departments/Cluster (for table no. A7.1)

No Record

PART-B: Program information

B1. Provide the Required Information for the Program Applied For:

Table No. B1: Program details.

A. List of the Programs Offered by the Department:

SR.NO.	PROGRAM NAME	PROGRAM APPLIED LEVEL	YEAR OF START / YEAR OF CLOSED	SANCTIONED INTAKE	INCREASE/DECREASE INTAKE (if any)	YEAR OF INCREASE/DECREASE	CURRENT INTAKE	YEAR OF AICTE APPROVAL	AICTE/COMPETENT AUTHORITY APPROVAL DETAILS	ACCREDITATION STATUS	FROM	TO	NO. OF TIMES PROGRAM ACCREDITED
1	Mechanical Engineering	UG	2011 / --	60	Yes	NA	30	2021	BOG	Eligible but not applied	--	--	0

Sanctioned Intake for Last Five Years for the Mechanical Engineering	
Academic Year	Sanctioned Intake
2024-25	30
2023-24	30
2022-23	30
2021-22	30
2020-21	60
2019-20	60

List of the Allied Departments/Cluster and Programs:

B2. Detail of Head of the Department for the program under consideration:

A. Name of the HoD :	Dr Rajesh Sharma
B. Nature of appointment:	Regular
C. Qualification:	Ph.D

B3. Program Details

Table No.B3.1: Admission details for the program excluding those admitted through multiple entry and exit points.

Item (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)	2024-25 (CAY)	2023-24 (CAYm1)	2022-23 (CAYm2)	2021-22 (CAYm3)	2020-21 (CAYm4)	2019-20 (CAYm5)	2018-19 (CAYm6)
N=Sanctioned intake of the program (as per AICTE /Competent authority)	30	30	30	30	60	60	60
N1=Total no. of students admitted in the 1st year minus the no. of students, who migrated to other programs/ institutions plus no. of students, who migrated to this program	24	24	30	24	38	38	52
N2=Number of students admitted in 2nd year in the same batch via lateral entry including leftover seats	0	0	0	0	0	0	0
N3=Separate division if any	0	0	0	0	0	0	0
Total number of students admitted in the program (N1 + N2 + N3 + N4) - excluding those admitted through multiple entry and exit points.	24	24	30	24	38	38	52

CAY= Current Academic Year. CAYm1= Current Academic Year Minus 1 CAYm2= Current Academic Year Minus 2. LYG= Last Year Graduate. LYGm1= Last Year Graduate Minus 1. LYGm2= Last Year Graduate Minus 2.

B4. Enrolment Ratio in the First Year

Table No. B4.1: Student enrolment ratio in the 1st year.

Year of entry	N (From Table 4.1)	N1 (From Table 4.1)	N4 (From Table 4.1)	Enrollment Ratio [(N1/N)*100]
2024-25 (CAY)	30	24	24	160.00
2023-24 (CAYm1)	30	24	24	160.00
2022-23 (CAYm2)	30	30	30	200.00

Average $[(ER1 + ER2 + ER3) / 3] = 173.33 \approx 100$

B5. Success Rate of the Students in the Stipulated Period of the Program

Table No.B5.1: The success rate in the stipulated period of a program.

Item	(2020-21) LYG	(2019-20) LYGm1	(2018-19) LYGm2
A*= (No. of students admitted in the 1st year of that batch and those actually admitted in the 2nd year via lateral entry, plus the number of students admitted through multiple entry (if any) and separate division if applicable, minus the number of students who exited through multiple entry (if any).	60.00	60.00	60.00
B=No. of students who graduated from the program in the stipulated course duration	38.00	38.00	52.00
Success Rate (SR)= (B/A) * 100	63.33	63.33	86.67

Average SR of three batches $((SR_1 + SR_2 + SR_3)/3)$: 71.11

B6. Academic Performance of the First-Year Students of the Program

Table No.B6.1: Academic Performance of the First-Year Students of the Program.

Academic Performance	CAYm1(2023-24)	CAYm2(2022-23)	CAYm3 (2021-22)
Mean of CGPA or mean percentage of all successful students(X)	5.77	5.20	7.15
Y=Total no. of successful students	24.00	30.00	24.00
Z=Total no. of students appeared in the examination	24.00	30.00	24.00
API [X*(Y/Z)]	5.76	5.20	7.15

Average API[(AP1+AP2+AP3)/3] : 6.04

B7: Academic Performance of the Second Year Students of the Program

Table No.B7.1: Academic Performance of the Second Year Students of the Program.

Academic Performance	CAYm1 (2023-24)	CAYm2 (2022-23)	CAYm3 (2021-22)
X=(Mean of 2nd year grade point average of all successful students on a 10-point scale) or (Mean of the percentage of marks of all successful students in 2nd year/10)	6.09	6.51	7.53
Y=Total no. of successful students	28.00	20.00	38.00
Z=Total no. of students appeared in the examination	30.00	24.00	38.00
API [X * (Y/Z)]	5.68	5.42	7.53

Average API [(AP1 + AP2 + AP3)/3] : 6.21

B8. Academic Performance of the Third Year Students of the Program

Table No.B8.1: Academic Performance of the Third Year Students of the Program

Academic Performance	CAYm1 (2023-24)	CAYm2 (2022-23)	CAYm3 (2021-22)
X=(Mean of 3rd year grade point average of all successful students on a 10-point scale) or (Mean of the percentage of marks of all successful students in 3rd year/10)	6.11	7.54	8.88
Y=Total no. of successful students	20.00	38.00	38.00
Z=Total no. of students appeared in the examination	20.00	38.00	38.00
API [X*(Y/Z)]:	6.11	7.54	8.88

Average API [(AP1 + AP2 + AP3)/3] : 7.51

B9. Placement, Higher Studies, and Entrepreneurship

Table No.B9.1: Placement, higher studies, and entrepreneurship details.

Item	LYG (2020-21)	LYGm1(2019-20)	LYGm2(2018-19)
FS*=Total no. of final year students	60.00	60.00	60.00
X=No. of students placed	24.00	35.00	45.00
Y=No. of students admitted to higher studies	0.00	2.00	0.00
Z=Total no. of students appeared in the examination	5.00	0.00	0.00
Placement Index(P) = (((X + Y + Z)/FS) * 100):	48.33	61.67	75.00

Average Placement Index = (P_1 + P_2 + P_3)/3: 61.67 Placement Index Points:

PART C: Faculty Details in Department and Allied Departments

(Data to be filled in for the Department and Allied Departments)

C1. Faculty details of Department and Allied Departments

Table No.C1: Faculty details in the Department for the past 3 years including CAY

Sr.No	Name of the Faculty	PAN No.	Highest degree	University	Area of Specialization	Date of Joining in this Institution	Experience in years in current institute	Designation at Time Joining in this Institution	Present Designation	The date on which Designated as Professor/ Associate Professor if any	Nature of Association (Regular/ Contract/ Ad hoc)	Currently Associated (Y/N)	In case of NO, Date of Leaving	IS HOD?
1	Dr Mohit Kalsia	XXXXXXX43H	Ph.D	Lovely Professional University	Mechanical Engineering	06/01/2020	5.2	Assistant Professor	Assistant Professor		Regular	Yes		No
2	Dr Rakesh Goyal	XXXXXXX10H	Ph.D	Punjab Technical University	Mechanical Engineering	23/06/2008	16.9	Lecturer	Professor	01/07/2022	Regular	Yes		No
3	Dr Sunil Kumar	XXXXXXX16G	Ph.D	Chitkara University	Mechanical Engineering	15/10/2008	16.5	Lecturer	Professor	01/04/2024	Regular	Yes		No
4	Dr Kulwinder Singh	XXXXXXX60G	Ph.D	Chitkara University	Mechanical Engg. (Production Engg.)	24/08/2009	15.7	Lecturer	Professor	01/07/2023	Regular	Yes		No
5	Dr Jaswinder Singh	XXXXXXX73C	Ph.D	Punjab Engineering College	Ergonomics	15/12/2014	10.3	Associate Professor	Professor	01/07/2024	Regular	Yes		No
6	Dr Mohit Rana	XXXXXXX33P	Ph.D	Chitkara University	Mechanical Engineering	17/08/2015	9.7	Assistant Professor	Assistant Professor		Regular	Yes		No
7	Dr Vijay Kumar Sharma	XXXXXXX33R	Ph.D	Chitkara University	Mechanical Engineering (Prod.Engg.)	17/08/2015	9.7	Assistant Professor	Assistant Professor		Regular	Yes		No
8	Dr Talvinder Singh	XXXXXXX92L	Ph.D	Chitkara University	Mechanical Engg. (Production & Industrial Engg.)	15/01/2016	9.2	Assistant Professor	Assistant Professor		Regular	Yes		No
9	Dr Jaspreet Singh	XXXXXXX85M	Ph.D	Punjabi University	Thermal Science	15/01/2016	9.2	Assistant Professor	Assistant Professor		Regular	Yes		No
10	Dr Sonu Sharma	XXXXXXX50K	Ph.D	National Institute of Technology	Mechanical Engineering	24/06/2019	5.9	Assistant Professor	Assistant Professor		Regular	Yes		No
11	Dr Rajesh Kumar	XXXXXXX23N	Ph.D	The Baba Institute of Technology & Science	Mechanical Engg (Thermal Science)	24/06/2019	5.9	Associate Professor	Professor	01/04/2024	Regular	Yes		No
12	Dr Rajesh Sharma	XXXXXXX57Q	Ph.D	Punjab Technical University	Mechanical Engineering	05/11/2022	2.4	Professor	Professor	05/11/2022	Regular	Yes		Yes

13	Dr Abhishek Kumar	XXXXXXXX83N	Ph.D	IIT, Ropar	Mechanical Engineering	21/11/2022	2.4	Assistant Professor	Assistant Professor		Regular	Yes		No
14	Dr Vishal Jagota	XXXXXXXX30M	Ph.D	National Institute of Technology	Mechanical Engineering	05/12/2022	2.3	Assistant Professor	Associate Professor	01/04/2023	Regular	Yes		No
15	Dr Rajneesh Kumar	XXXXXXXX41Q	Ph.D	National Institute of Technology	Mechanical Engineering	14/12/2022	2.3	Assistant Professor	Assistant Professor		Regular	Yes		No
16	Dr Manpreet Singh	XXXXXXXX55D	Ph.D	Thapar Institute of Engineering and Technology	Mechanical Engineering	02/08/2023	1.7	Assistant Professor	Assistant Professor		Regular	Yes		No
17	Dr Mukheshwar Yadav	XXXXXXXX51B	Ph.D	Deenbandhu Chhotu Ram University of Science and Technology	Mechanical Engineering	06/01/2006	17.5	Assistant Professor	Assistant Professor		Regular	No	08/06/2023	No

Table No.C2: Faculty details of Allied Departments for the past 3 years including CAY.

C2. Student-Faculty Ratio (SFR)

No. of UG(Engineering) programs in Department including allied departments/ clusters (UGn):

UG1=1st UG program

UGn=nth UG program

B= No. of Students in UG 2nd year (ST)

C= No. of Students in UG 3rd year (ST)

D= No. of Students in UG 4th year (ST)

No. of PG (Engineering) programs in Department including allied departments/ clusters (PGm):

PG1=1st PG program.

PGm=mth PG program

A= No. of Students in PG 1st year

B= No. of Students in PG 2nd year

Student Faculty Ratio (**SFR**) = S/F

S= No. of students of all programs in the Department including all students of allied departments/clusters.

No. of students (ST)=Sanctioned Intake (SA)+ Actual admitted students via lateral entry including leftover seats (L) if any (limited to 10 % of SA)

Students who admitted under supernumerary quotas (SNQ, EWS, etc) will not be considered in calculating SFR value. Those students are exempted.

F=Total no. of regular or contractual faculty members (Full Time) in the Department, including allied departments/clusters (excluding first year faculty (The faculty members who have a 100% teaching load in the first-year courses)).

No. of UG Programs in the Department1 No. of PG Programs in the Department0

Table No.C2.1: Student-faculty ratio.

Description	CAY(2024-25)	CAYm1 (2023-24)	CAYm2 (2022-23)
UG1.B	30	30	30
UG1.C	30	30	60
UG1.D	30	60	60
UG1: Mechanical Engineering	90	120	150
DS=Total no. of students in all UG and PG programs in the Department	90	120	150
AS=Total no. of students of all UG and PG programs in allied departments	0	0	0

Description	CAY(2024-25)	CAYm1 (2023-24)	CAYm2 (2022-23)
S=Total no. of students in the Department (DS) and allied departments (AS)	S1= 90	S2= 120	S3= 150
DF=Total no. of faculty members in the Department	16	16	12
AF= Total no. of faculty members in the allied Departments	0	0	0
F=Total no. of faculty members in the Department (DF) and allied Departments (AF)	F1= 16	F2= 16	F3= 12
FF=The faculty members in F who have a 100% teaching load in the first-year courses	2	2	2
Student Faculty Ratio (SFR)=S/(F-FF)	SFR1= 6.43	SFR2= 8.57	SFR3= 15.00
Average SFR for 3 years	SFR= 10.00		

C3. Faculty Qualification

- Faculty qualification index (FQI) = $2.5 * [(10X + 4Y)/RF]$ where
- X=No. of faculty members with Ph.D. degree or equivalent as per AICTE/UGC norms.
- Y=No. of faculty members with M. Tech. or ME degree or equivalent as per AICTE/ UGC norms.
- RF=No. of required faculty in the Department including allied Departments to adhere to the 20:1 Student-Faculty ratio, with calculations based on both student numbers and faculty requirements as per section C2 of this documents: (RF=S/20).

Table No.C3.1: Faculty qualification.

Year	X	Y	RF	FQ = $2.5 \times [(10X + 4Y) / RF]$
2024-25(CAY)	15	1	4.00	96.25
2023-24(CAYm1)	15	1	5.00	77.00
2022-23(CAYm2)	11	1	7.00	40.71

C4. Faculty Cadre Proportion

- Faculty Cadre Proportion is 1(RF1): 2(RF2): 6(RF3)
- RF1= No. of Professors required = $1/9 * \text{No. of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (S) as per C2 of this documents.}$
- RF2= No. of Associate Professors required = $2/9 * \text{No. of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (S) as per section C2 of this documents.}$
- RF3= No. of Assistant Professors required = $6/9 * \text{No. of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (S) as per section C2 of this documents.}$
- Faculty cadre and qualification and experience should be as per AICTE/UGC norms.

Table No.C4.1: Faculty cadre proportion details.

Year	Professors		Associate Professors		Assistant Professors	
	Required RF1	Available AF1	Required RF2	Available AF1	Required RF3	Available AF3
2024-25	1.00	6.00	1.00	1.00	3.00	9.00
2023-24	1.00	3.00	1.00	4.00	4.00	9.00
2022-23	1.00	1.00	1.00	4.00	5.00	7.00
Average	RF1=1.00	AF1=3.33	RF2=1.00	AF2=3.00	RF2=4.00	AF2=8.33

C5. Visiting/Adjunct Faculty/Professor of Practice

Table No. C5.1: List of visiting/adjunct faculty/professor of practice and their teaching and practical loads.

(CAYm1)

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	Dr K C Vora	Sr. Deputy Director	ARAI Academy, Pune	Manufacturing Practices	64.00

(CAYm2)

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	Mr Inderpal Sandhu	Ex-Design Engineer	General Motors	Design Thinking	50.00

(CAYm3)

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	Dr K C Vora	Sr. Deputy Director	ARAI Academy, Pune	Manufacturing Practices	54.00

C6. Academic Research

Table No. C6.1: Faculty publication details.

S.No.	Item	2023-24 (CAYm1)	2022-23 (CAYm2)	2021-22 (CAYm3)
1	No. of peer reviewed journal papers published	10	11	15
2	No. of peer reviewed conference papers published	3	19	31
3	No. of books/book chapters published	3	6	5

C7. Sponsored Research Project

Table No. C7.1: List of sponsored research projects received from external agencies.

(CAYm1)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
-	-	-	-	-	-	0.00
						Amount received (Rs.):0.00

(CAYm2)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
-	-	-	-	-	-	0.00
						Amount received (Rs.):0.00

(CAYm3)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Dr Rakesh Goyal	-	Department of Mechanical Engineering	Analysis of Tool Performance and Surface Quality in Face Milling Carbon Steel in Various Machining Environments under CNC	Oasis Enterprises, Plot No 451 Industrial Area, Phase-1, Panchkula, Haryana 134109, India	03 Years	29.14
						Amount received (Rs.):29.14

Total Amount (Lacs) Received for the Past 3 Years: 29.14

Note*:

- Only sponsored research projects will be considered. Infrastructure-based projects will not be considered here.

C8. Consultancy Work

Table No. C8.1: List of consultancy projects received from external agencies.

(CAYm1)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Dr Rakesh Goyal	-	Department of Mechanical Engineering	Optimization of Process Parameters of the Wire Thermal Spray Gun	Synco Industries Limited 16-A (III) Heavy Industrial Area, Jodhpur -342003, India	01 Years	0.40
						Amount received (Rs.):0.40

(CAYm2)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Dr Rakesh Goyal	-	Department of Mechanical Engineering	Enhancement of working life of boiler tubes with the help of Thermal spray coatings in high temperature environment	Karan Boilers, Nasirpur, Hisar road, Ambala city, Haryana - 134008	01 Years	0.10
Dr Rakesh Goyal	-	Department of Mechanical Engineering	Troubleshooting and analysis of the problems encountered in the manufacturing and working of the oil fired burners	Karan Boilers, Nasirpur, Hisar road, Ambala city, Haryana - 134008	01 Years	0.10
						Amount received (Rs.):0.20

(CAYm3)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Dr Sunil Kumar	-	Department of Mechanical Engineering	Using an enhanced latent heat storage method in food packaging	Aggarwal Chinese Corner Door No 973 Near Water Tank Ismailabad Kurukshetra Haryana-136129 India	01 Years	6.56
Dr Vijay Kumar Jadon	Dr Ajay Sharma	Department of Mechanical Engineering	Onsite Elixir for Foliar Diseases in Paddy crop using Unmanned Aerial Vehicle	Arjun Dev & Sons 41 Juwhar Market Rajpura Town-140150 India	02 Years	17.78
Dr Sunil Kumar	Varinder Singh	Department of Mechanical Engineering	Analysis of Regulatory Mechanisms With Regard To Newspaper And Television Reporting In India for Accountability of Media	Chandika Press Pvt. Ltd 126 Phase-1 Industrial Area Chandigarh India	01 Years	34.65
Dr Kulwinder Singh	Dr Abhineet Saini	Department of Mechanical Engineering	An Evaluation Of A Hole Entry Hybrid Journal Bearing Run On Er Fluids	Subhash Chand Sushil Kumar 1727 Shastri Market Rajpura India	01 Years	18.26
						Amount received (Rs.):77.25

Total amount (Lacs) received for the past 3 years: 77.85

Note*:

- Only consultancy projects will be considered. Infrastructure-based projects will not be considered here.

C9. Institution Seed Money or Internal Research Grant to its Faculty for Research Work

Table No. C9.1: List of faculty members received seed money or internal research grant from the Institution.

(CAYm1)

Faculty name	Project title/ Support for Activity	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25	Amount Utilized(Lacs) i.e. 15,25,000=15.25	Outcomes of the project
Rakesh Goyal	Optimizing Industrial Processes: Metal Spray Gun Innovations	02 Years	2.50	0.25	Research Publications
Rakesh Goyal	Prolonging Agricultural Equipment Lifespan: Developing Wear-Resistant Alloy Powder Coatings	02 Years	2.50	1.15	Research Publications
Rakesh Goyal	WALL/ DOOR HANGER HOOK WITH POPUP BUTTON	01 Year	0.07	0.07	Patent Filled / Patent Published
Jaswinder Singh	SMART KEY HOLDER	01 Year	0.27	0.27	Patent Filled / Patent Published
Jaswinder Singh	MANURE COLLECTION DEVICE	01 Year	0.33	0.33	Patent Filled / Patent Published
Vijay Kumar Sharma	UMBRELLA WITH ADJUSTABLE ROD SIZE	01 Year	0.09	0.09	Patent Filled / Patent Published
Jaspreet Singh	MULTI- UTILITY SOFA CUM TABLE SET (M.U.S.T)	01 Year	0.07	0.07	Patent Filled / Patent Published
Jaspreet Singh	GEYSER WITH EXTENDED LIFESPAN HEATING ELEMENT/ROD	01 Year	0.07	0.07	Patent Filled / Patent Published
Vishal Jagota	SAFE NOTICE BOARD PINS	01 Year	0.09	0.09	Patent Filled / Patent Published
			Amount received (Rs.): 5.99		

(CAYm2)

Faculty name	Project title/ Support for Activity	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25	Amount Utilized(Lacs) i.e. 15,25,000=15.25	Outcomes of the project
Dr Rakesh Goyal	Versatile Heat Treatment Solutions: Portable and Muffle Furnace Technologies	2 Years	2.50	2.49	Research Publications
Dr Rakesh Goyal	Optimizing Industrial Processes: Metal Spray Gun Innovations	2 Years	2.50	2.24	Research Publications
Dr Rakesh Goyal	Prolonging Agricultural Equipment Lifespan: Developing Wear-Resistant Alloy Powder Coatings	2 Years	2.50	1.33	Research Publications
Mohit Kalsia	ONE HAND OPERATED SOLDER PEN	01 Year	0.07	0.07	Patent Filled / Patent Published
Dr Rakesh Goyal	HEAT TREATMENT ELECTRIC FURNACE	01 Year	0.26	0.26	Patent Filled / Patent Published
Dr Rakesh Goyal	WALL/ DOOR HANGER HOOK WITH POPUP BUTTON	01 Year	0.07	0.07	Patent Filled / Patent Published
Jaswinder Singh	SMART KEY HOLDER	01 Year	0.27	0.27	Patent Filled / Patent Published
Vijay Kumar Sharma	SELF SANITIZING DOOR HANDLE	01 Year	0.10	0.10	Patent Filled / Patent Published
Vijay Kumar Sharma	TRACKING PHONE HOLDER	01 Year	0.10	0.10	Patent Filled / Patent Published
Vijay Kumar Sharma	ADJUSTABLE CHALK HOLDER WITH POINTER DEVICE	01 Year	0.07	0.07	Patent Filled / Patent Published
Vishal Jagota	SAFE NOTICE BOARD PINS	01 Year	0.28	0.28	Patent Filled / Patent Published
			Amount received (Rs.): 8.72		

(CAYm3)

Faculty name	Project title/ Support for Activity	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25	Amount Utilized(Lacs) i.e. 15,25,000=15.25	Outcomes of the project
Mohit Kalsia	COMFY VIRTUAL HAND APPARATUS FOR BABY SLEEP COMFORT	01 Year	0.07	0.07	Patent Filled / Patent Published
Mohit Kalsia	HOLDER FOR HANDBAGS OR CARRY BAGS	01 Year	0.20	0.20	Patent Filled / Patent Published
Mohit Kalsia	SPILL PROOF TRAVEL WATER BOTTLE	01 Year	0.10	0.10	Patent Filled / Patent Published
Rakesh Goyal	HEAT TREATMENT ELECTRIC FURNACE	01 Year	0.10	0.10	Patent Filled / Patent Published
Rakesh Goyal	ROTARY JOB HOLDER CASE HARDENING FURNACE	01 Year	0.10	0.10	Patent Filled / Patent Published
Rakesh Goyal	HEAT TREATMENT FURNACE WITH CONTROLLED ATMOSPHERE AND CONTROLLED SPEED	01 Year	0.10	0.10	Patent Filled / Patent Published
Rakesh Goyal	CASE HARDENING HEAT TREATMENT FURNACE WITH CONTROLLED ENVIRONMENT	01 Year	0.10	0.10	Patent Filled / Patent Published
Kulwinder Singh	Rotatable Laptop Stand	01 Year	0.07	0.07	Patent Filled / Patent Published
Jaswinder Singh	GRASS AND STRAW COLLECTOR	01 Year	0.10	0.10	Patent Filled / Patent Published
Jaswinder Singh	AUTOMATIC THREAD WEAVING MACHINE	01 Year	0.22	0.22	Patent Filled / Patent Published
Jaswinder Singh	AUTOMATIC SOLAR TRACKER	01 Year	0.10	0.10	Patent Filled / Patent Published
Jaswinder Singh	ADJUSTABLE MILK CAN HANDLE	01 Year	0.10	0.10	Patent Filled / Patent Published
Sonu Sharma	DOUBLE STAGE VERTICAL AXIS TWIN BLADE TURBINE	01 Year	0.20	0.20	Patent Filled / Patent Published
			Amount received (Rs.): 1.56		

Total amount (Lacs) received for the past 3 years : 16.27

PART D: Laboratory Infrastructure in the Department (Data to be filled in for the Department)

D1. Adequate and Well-Equipped Laboratories, and Technical Manpower

Table No.D1.1: List of laboratories and technical manpower.

Sr. No	Name of the Laboratory	Number of students per set up(Batch Size)	Name of the Important Equipment	Weekly utilization status(all the courses for which the lab is utilized)	Technical Manpower Support		
					Name of the Technical staff	Designation	Qualification
1	Refrigeration and Air Conditioning Lab	15	Electrolux Refrigerator with digital Control Panel test rig, Window Air Conditioner Test Rig, Ice Plant Test Rig, Vapor Compression Test Rig	04 hrs.	Mr. Rajesh Kumar	Senior Lab Instructor	Diploma Mechanical
2	Heat Transfer Lab	15	Stepan Boltzmann Constant, Equipment for Thermal Conductivity of Insulating Slab, Equipment for Thermal Conductivity of Insulating Powder	04 hrs.	Mr. Rajesh Kumar	Senior Lab Instructor	Diploma Mechanical
3	Fluid Mechanics Lab	15	Metacentric Height Equipment, Flow through variable area duct, flow through venturi meter, siphon meter, Venturi Test Rig, Flow Apparatus	04 hrs.	Mr. Rajesh Kumar	Senior Lab Instructor	Diploma Mechanical
4	Applied Thermodynamics Lab	15	Single cylinder diesel engine test rig with rope brake dynamometer, Axial fan test rig, Centrifugal Pump Test Rig, Compressor and throttle	04 hrs.	Mr. Raj Kumar Kaushal	Senior Lab Instructor	Diploma Mechanical
5	Design Thinking Lab	15	39 computers, Dell-1 (16GB RAM, 500GB HDD), ACER-38 (5GB RAM, 500 GB HDD)	04 hrs.	Mr. Raj Kumar Kaushal	Senior Lab Instructor	Diploma Mechanical
6	Fluid Machinery Lab	15	Hydraulic Ram Test Rig, Francis Turbine Test Rig 1 HP capacity, Reciprocating Pump Test Rig, Pelton Turbine Test Rig, FHP Test Rig, Centrifugal Pump Test Rig	04 hrs.	Mr. Raj Kumar Kaushal	Senior Lab Instructor	Diploma Mechanical
7	Theory of Machines Lab	15	Universal Vibration Apparatus, CAM Analysis Apparatus, Static and Dynamic Balancing Machine, Metacentric Height Equipment, Journal Bearing	04 hrs.	Mr. Krishan Kumar	Senior Lab Instructor	ITI; Diploma Mechanical
8	Mechanical Measurement and Metrology Lab	15	Tool makers Microscope, Profile Projector, Surface Roughness Tester, Stroboscope (digital), Slip Gauge (60 Dia), Vernier Caliper (0-200mm)	04 hrs.	Mr. Krishan Kumar	Senior Lab Instructor	ITI; Diploma Mechanical
9	Strength of Materials Lab	15	UTM -40(complete with load unit), Rockwell hardness testing machine (RAB-250), Hardness testing machine VM 50, FIE Tensile Testing	04 hrs.	Mr. Krishan Kumar	Senior Lab Instructor	ITI; Diploma Mechanical
10	Engineering Materials and Metallurgy Lab	15	Diamond and alumina polisher, mounting press, Metallurgical microscope (1000X), Belt grinder, Test rig for metallography, Micrograph	04 hrs.	Mr. Karun Kumar Sharr	Sr. Instructor	ITI
11	Hydraulic and Pneumatic Lab	15	Hydraulic Trainer, Pneumatic Trainer, Vacuum and Pressure Grippers, Cascade Control, Force Control, Time and speed control, PLC Logic based	04 hrs.	Mr. Karun Kumar Sharr	Sr. Instructor	ITI
12	Automobile Engineering Lab	15	Car Scanner, Wheel Alignment Machine, Wheel Balancing Machine, Tire Changer, Nitrogen Gas filling Machine, Oil change Machine, AC Gas	04 hrs.	Mr. Rajesh Kumar (AE)	Automobile Instructor	ITI
13	Machine Shop	4	CNC Milling, CNC Turning, C.I Surface Plate "18x18", Lathe Machine (cone pulley) Lathe Machine, 4 feet wide Engine Tool Grinder	06 hrs.	Mr. Baljeet Singh	Sr. Workshop Instructor	ITI
14	Foundry Shop	4	Aluminum melting furnace, Crucible Graphite 13x17	06 hrs.	Mr. Sukhdev Singh	Sr. Workshop Instructor	ITI
15	Sheet Metal Shop	4	Shearing M/C 15" Hand Lever, Shearing M/C 08" Hand Lever	06 hrs.	Mr. Nand Lal	Sr. Workshop Instructor	ITI
16	Carpentry Shop	4	Hand Drill Machine ½, Jigsaw Machine, Wood Working Lathe Machine 6"	06 hrs.	Mr. Ravinder Kumar	Sr. Workshop Instructor	ITI

17	Fitting Shop	4	Block "V" 100x80x80 mm, Drilling M/C Piller Type 1/2", Surface plate "18x18", Vice 4	06 hrs.	Mr. Bhupinder Kumar	Sr. Workshop Instructor	ITI
18	Welding Shop	4	AC Arc Welding Transformer 300 Amps, Acetylene Cylinder, Argon Cylinder, CO2 Gas Cylinder	06 hrs.	Mr. Raghubir Singh	Sr. Workshop Instructor	ITI
19	Estimation and Measurement shop	4	Digital weighing scale, Steel measuring tape 3m, Steel measuring tape 5m, Steel foot rule 12"	06 hrs.	Mr. Davinder Singh	Technician	ITI
20	Sand Testing Lab	4	Clay Washer, Core Hardness Tester, Permeability Meter, Rapid Moisture Tester, Sand Mullar Sand	06 hrs.	Mr. Sukhdev Singh	Sr. Workshop Instructor	ITI

D2. Safety Measures in Laboratories

Table No. D2.1: List of various safety measures in laboratories.

Sr. No	Laboratory Name	Safety Measures
1	Fluid Mechanics Lab	Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Floor should be kept dry at all times. 2. Water on the floor must be swept away immediately. 3. Water level inside the water related equipment must not rise beyond the safe level. Users to look out at all times in case water hose falls off or water overflows from water related equipment. 4. Read and understand the safety precautions for the operation of machine/equipment before use. 5. Students should follow the university dress code at all times. 6. Clean the work area and return all tools after use. 7. All power extension cords must be secured above ground level. 8. Seek approval from staff before using any piece of machine/equipment. 9. Secure all apparatus/equipment at all times. 10. Report any damage of equipment/instrument to staff immediately. 11. Notify the staff if the experiment is to be continued or equipment is to be 'ON' after office hours.
2	Fluid Machinery Lab	Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Floor should be kept dry at all times. 2. Water on the floor must be swept away immediately. 3. Water level inside the water related equipment must not rise beyond the safe level. Users to look out at all times in case water hose falls off or water overflows from water related equipment. 4. Read and understand the safety precautions for the operation of machine/equipment before use. 5. Unauthorized persons are not permitted in the laboratory. 6. Students should follow the university dress code at all times. 7. Clean the work area and return all tools after use. 8. All power extension cords must be secured above ground level. 9. Seek approval from staff before using any piece of machine/equipment. 10. Secure all apparatus/equipment at all times. 11. Report any damage of equipment/instrument to staff immediately. 12. Notify the staff if the experiment is to be continued or equipment is to be 'ON' after office hours.

3	<div data-bbox="247 280 770 391" style="border: 1px solid black; padding: 5px;"> Automobile Engineering Lab </div>	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Always wear closed-toe shoes and avoid loose or torn clothing; use lab uniforms and appropriate protective gear like goggles, gloves, and ear protection. 2. Do not operate any vehicle or machine unless you are trained or under supervision—always consult the instructor when in doubt. 3. Never stand in front of a running vehicle in the lab; ensure it's operated only at walking speed inside the workshop. 4. Always use jack stands when working under lifted vehicles—never rely on jacks alone. 5. Confirm proper contact of lift arms with the chassis before fully lifting a vehicle. 6. Keep the work area clean—immediately clean up spills of oil, grease, or fuel to avoid slip hazards. 7. Return tools to designated locations after use and maintain an inventory of student tool kits. 8. Ensure fuel lines are properly connected, and the brake pedal is firm before starting any engine. 9. Never accelerate engines to high RPM under no-load conditions and avoid reaching over fan blades during operation. 10. Always follow the standard procedure while dismantling or assembling automotive systems like gearboxes; use proper tools, label parts systematically, and ensure all components are cleaned and rechecked before reassembly. 11. Disconnect the negative battery terminal before working on any electrical system. 12. After any lab work, return vehicles to their original condition, lower all lifts, turn off ignition, and disconnect batteries if required. 13. Use equipment only for its intended purpose and apply force cautiously—report resistance or malfunction to lab staff.</p>
4	<div data-bbox="247 695 770 805" style="border: 1px solid black; padding: 5px;"> Refrigeration and Air Conditioning Lab </div>	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Floor should be kept dry at all times. 2. Do not operate any equipment in the absence of lab incharge/instructor. 3. Do not come in the lab with loose garments and barefoot. 4. Do not operate the machine at low voltage. 5. Always use clean water for performing the experiment. 6. Clean apparatus before and after experiments. 7. Keep away from rotation parts. 8. After the experiment is over, open all the delivery and suction valves and switch OFF the motor. 9. Follow safety precautions related to specific experiment.</p>
5	<div data-bbox="247 1027 770 1138" style="border: 1px solid black; padding: 5px;"> Applied Thermodynamics Lab </div>	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Do not touch any equipment in the absence of lab in charge/instructor. 2. Do not come in the lab with loose garments. 3. Before performing the experiment, go through the procedure through the lab manual and develop an understanding of the experiments. 4. Use equipment with care for the purpose for which it is intended. 5. Do not touch any moving parts of the equipment /apparatus. 6. Before starting the engine, see the oil level in the sump. 7. After running the engine, open the regulation water cock. 8. During running the diesel engine, do not temper with decompression lever. 9. Load the engine gradually. 10. After putting the load on diesel engine, open the water tap for water circulation in the brake drum. 11. Check the water level in the boiler of separating and throttling calorimeter.</p>

6	Engineering Materials and Metallurgy Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Follow the standard operating procedures for work with hazardous materials. 2. Wear and use required personal protective equipment while working on grinders and furnaces. 3. Refrain from operating any mechanical equipment that has the potential to harm personnel or property unless guided by the lab Supervisor. 4. Do not use equipment if you are using any medication or under the influence of drugs, alcohol, etc. 5. Be careful while grinding the sample on the rotatory grinder and belt grinder. 6. No loose clothing including ties, necklaces, floppy sleeves, etc. 7. Keep your work area clean, do not place tools and materials on the grinders and furnaces. 8. Use tongs and gloves while doing heat treatment processes and removing the heated samples from the furnace. 9. Always follow the Lab Supervisor's directions. 10. Report ALL injuries (even small ones) to the lab Supervisor or Facility In-charge.</p>
7	Mechanical Measurement and Metrology Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Students are not allowed to touch any equipment, chemicals or other materials in the laboratory area until you are instructed by Teacher or Lab In-charge. 2. Before starting Laboratory work follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask your concern teacher before proceeding your activity. 3. Before use equipment must be read carefully Labels and instructions. Set up and use the equipment as directed by your teacher. 4. If you do not understand how to use a piece of equipment, ASK THE TEACHER FOR HELP! 5. Perform only those experiments authorized by your teacher. 6. Any failure / break-down of equipment must be reported to the teacher. 7. Laboratories must be locked if no one is in the lab. 8. Electrical equipment and connections should not be handled with wet hands, nor should they be used after liquid has been spilled on it. 9. Students should follow the university dress code at all times. 10. Secure all apparatus/equipment at all times.</p>
8	Heat Transfer Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Stay in assigned section during the lab period. 2. Do not alter the lab set-up. Ask your instructor if something is missing or out of place. 3. Check the electrical connections before switching on the panel. 4. Check for any loose connection in the wire and also check for any air gap in the tubes of the pressure tapping points. 5. Operate all the switches and controls gently. 6. Do not attempt to alter the equipment as this may cause damage to the whole system. 7. Do not touch any live electrical wire in the lab. 8. Take observation under steady state condition. 9. Do not apply excessive force on any equipment. Consult lab Supervisor, if it is required. 10. Don't rush/run in the Lab. 1. Report any short circuit, burning smell, to lab engineer immediately.</p>

9	Strength of Materials Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Students should report to the labs concerned as per the timetable. 2. Record should be updated from time to time and the previous experiment must be signed by the faculty in charge concerned before attending the lab. 3. Students who turn up late to the labs will in no case be permitted to perform the experiment scheduled for the day. 4. Not more than FIVE students in a group are permitted to perform the experiment on a set up. 5. The group-wise division made in the beginning should be adhered to, and no mix up of student among different groups will be permitted later. 6. When the experiment is completed, students should disconnect the setup made by them, and should return all the components/instruments taken for the purpose. 7. Procedure sheets provided to the student's groups should be maintained neatly and are to be returned after the experiment. 8. Report any damage of equipment/instrument to staff immediately 9. Read and understand the safety precautions for the operation of machine/equipment before use 11. Students should follow the university dress code at all times.</p>
10	Theory of Machines Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Come prepared in the lab with practical notebook, instructions manual and all the accessories required for the lab work 2. Check the electrical connections properly. 3. Use of safety guard is compulsory. 4. Machine should be operated by only one student at a time, others shall observe. 5. Increase the speed of motor gradually. 6. Never touch any moving part of any instrument. 7. Make sure that your work is not affecting anybody else in the lab. 8. Always maintain safe distance from the apparatus. 9. Keeping floor free of oil, grease or any other liquid. 10. Check that all the rotating parts are free to turn and there is mechanical obstruction while turning. 11. No food and beverage in lab 12. Be sure that all machines have effective and properly working guards that are always in place where machines are operating 13. Get first aid immediately for any injury. 14. Don't wear rings, watches, bracelets or other jewellery that could get caught in moving machinery. 15. Operate all the switches and controls gently. 16. Unauthorized persons are not permitted in the laboratory. 1. All power extension cords must be secured above ground level.</p>
11	Design Thinking Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Protect yourself from electric shocks by not touching live naked wires and by following instruction with safety precautions. 2. Properly shutdown/switch off all equipment/computers after use. 3. Use your id for any transaction and communication. 4. Do change your id passwords periodically. 5. Follow computer lab rules. 6. Do mark entry in lab access register before accessing the equipment and computer systems. 7. Do not eat or drink in the laboratory/computer lab. 8. Do not use mobile phones in computer labs and class rooms. 9. Do not touch equipment with wet hands. 10. Do not plugin USB drives/external storage media/CD's/DVD's on lab computers. 11. Do not add/install/remove software/application on or from lab computers. 12. Do not browse irrelevant websites on lab computers. 13. Do not keep dumps of pirated applications/software/music/videos/movies/songs on lab computers as well as on your storage devices. 14. Avoid stepping on electrical wires or on any other computer cables. 15. Do not open the system unit casing or monitor unit casing particularly when the power is turned on. 16. Do not insert the metal objects such as clips, pins and needles into the computer casing. They may cause fire. 17. Do not remove anything from the computers laboratory without permission. 18. Do not touch connected or disconnected any plug or cable without your faculty/instructor/lab attendant's permission. 19. Do not unplug power and data cables from sockets in computer labs. 20. Do not place your bags and water bottles along with monitors on table top. 21 Do not misbehave in the laboratory/computer labs.</p>

12	Hydraulic and Pneumatic Lab	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Always wear safety goggles, lab coat, and closed-toe shoes during lab activities. 2. Inspect hydraulic and pneumatic hoses and fittings for leaks or damage before use. 3. Never touch pressurized components or connections with bare hands while the system is active. 4. Ensure the system is depressurized and power supply is disconnected before maintenance. 5. Operate equipment strictly within the recommended pressure limits. 6. Secure all connections tightly before starting any experiment. 7. Keep hands and body parts away from moving actuators, cylinders, and grippers. 8. Handle PLC logic control panels with dry hands and proper grounding. 9. Use vacuum and pressure components only for their designed applications. 10. Be aware of the location and function of emergency stop buttons and pressure relief valves.</p>
13	Machine Shop	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Always wear a proper fitting apron/lab coat before starting work in a machine shop. Do not wear loose clothes. 2. Always wear safety goggles to protect your eyes against any flying chips or dust. 3. Keep your hands away from the moving cutter or workpiece. 4. Cover the pulleys and belts with safety guards while working. 5. Never let your clothes and hand come in contact with the revolving chuck, pulleys, belts, etc. 6. Workpiece should be held tightly between the live and dead centers. 7. Don't touch the chips. 8. Make sure that the cutting tool is tightly held in the tool post. 9. Do not touch the tool-tip during the grinding of the tool. 10. Don't give excessive feed to the cutting tool. It damages the tool-tip and may even cause an accident. 11. You must always know about the position of the fire extinguisher and first aid box in the shop. 12. If any accident is observed, immediately inform the instructor.</p>
14	Foundry Shop	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Wear safety shoes, safety goggles and an apron during the metal pouring operation. 2. Remove wrist watches, rings, bracelets etc. 3. The shop should be properly lighted and ventilated to avoid an accident. 4. During mould making, avoid excess moisture content and hard ramming. 5. Ensure proper fitting of mould box before pouring. 6. Do not touch the furnace body, it may be hot. 7. Keep a clear space around the pouring area. 8. Use proper tools while working in the pouring area. 9. Grasp the ladle firmly and be sure it is well balanced while transporting the molten metal. 10. Handle hot pieces with a tong. 11. Do not touch the casting immediately after removing from the mould. 12. You must always know about the position of the fire extinguisher and first aid box in the shop. 13. If any accident is observed, immediately inform the instructor.</p>

15	Sheet Metal Shop	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near the relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Never operate any machine unless you know how to operate it. 2. Always wear uniform in the workshop, never wear loose clothes. 3. Appropriate cutting tools and machines must be used for cutting tin sheets. 4. Do not use blunt cutting-edges tools. 5. Be careful while working on sharp edges to avoid injury. 6. Do not cut metal heavier than the capacity of snips or shears. 7. Save your hands while working on sheet bending or sheet rolling machines. 8. Do not place the hot soldering iron on any wooden surface; keep it on its stand. 9. In case of any fire, the electric supply should be disconnected. 10. Avoid breathing of fumes emanating from soldering flux. 11. You must always know about the position of the first aid box in the shop. 12. If any accident is observed, immediately inform the instructor.</p>
16	Carpentry Shop	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. While working, keep your attention on the job and do not indulge in talking. 2. Use safety goggles and gloves while working on lathe machine. 3. The tools being used should be well sharpened. 4. The shop floor should be well cleaned, free from scrap and wooden pieces carrying nails etc. 5. Safety guards provided on the machines should be in proper position and well secured. 6. Cutting should be started only when the machine attains full speed. 7. Turning tools should be held firmly. 8. Hold the chisel firmly while chipping. 9. You must always know about the position of the fire extinguisher and first aid box in the shop. 10. If any accident is observed, immediately inform the instructor.</p>
17	Fitting Shop	<p>Basic Safety Measures: 11. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 12. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 13. Labs are properly ventilated, and all equipment is provided with proper earthing. 14. Students must always work under supervision; working alone is not allowed. 15. Damaged equipment must be reported immediately and not used until repaired. 16. Loose clothing is not allowed to avoid accidents during machine operations. 17. Never leave experiments running unattended. 18. Charts showing operating procedures are displayed near relevant apparatus. 19. CCTV cameras monitor lab corridors; security guards are posted at each block. 20. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Never operate any machine unless you know how to operate it. 2. Always wear uniform in the workshop, never wear loose clothes. 3. Never touch moving parts, belts or rotating tools etc. 4. Always keep your attention on the job. 5. Hacksaw blade should be fixed in the proper direction and tightened. 6. Always move the hacksaw in perfect straight and horizontal direction. 7. Never tilt the hacksaw blade while sawing. 8. Hold the job in bench-wise properly. 9. If the heavy noise is generated while filing, readjust the height of job. 10. Drill the holes centralizing on pop marks, give gradual feed. 11. You must always know about the position of the first aid box in the shop. 12. If any accident is observed, immediately inform the instructor.</p>
18	Welding Shop	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near the relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Never look at a welding arc without a shield as the ultraviolet rays and infra-red rays emitted from the arc can harm the eyes and skin of the face. 2. Always wear flexible gauntlet gloves and a leather apron when welding. 3. Always wear leather safety shoes when welding. 4. Weld only in a fire safe area. 5. Never weld without adequate ventilation. 6. Never touch the hot job with your hands. 7. Always use proper tool for this purpose. 8. Chipping the slag off at low temperature and use appropriate chipping hammer. 9. Always turn off machines when welding is finished. 10. You must always know about the position of the fire extinguisher and first aid box in the shop. 11. If any accident is observed, immediately inform the instructor.</p>

19	<div data-bbox="245 186 770 300" style="border: 1px solid black; padding: 2px;"> Estimation and Measurement Shop </div>	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Never use any instrument unless you know how to use it. 2. Always wear uniform in the workshop, never wear loose clothes. 3. Appropriate measuring instrument must be used for measurement. 4. Be careful from sharp edges while working with measuring tape to avoid injury. 5. Do not measure heavier items than the capacity of weighing scale. 6. Save your hands and foot while estimating the mass of items. 7. In case of any fire, the electric supply should be disconnected. 8. You must always know about the position of the first aid box in the shop. 9. If any accident is observed, immediately inform the instructor.</p>
20	<div data-bbox="245 573 770 686" style="border: 1px solid black; padding: 2px;"> Sand Testing Shop </div>	<p>Basic Safety Measures: 1. Do's and Don'ts, emergency contacts, and evacuation routes are clearly displayed in each lab. 2. First aid box with basic items and a functional fire extinguisher are available at accessible locations. 3. Labs are properly ventilated, and all equipment is provided with proper earthing. 4. Students must always work under supervision; working alone is not allowed. 5. Damaged equipment must be reported immediately and not used until repaired. 6. Loose clothing is not allowed to avoid accidents during machine operations. 7. Never leave experiments running unattended. 8. Charts showing operating procedures are displayed near relevant apparatus. 9. CCTV cameras monitor lab corridors; security guards are posted at each block. 10. Cleanliness and safety are maintained by lab attendants and technical staff. Lab specific safety measure/precautions: 1. Alert and Attentive- Mind and eyes on the job. 2. Use proper (no open) shoes in workshop premises. 3. Use lab coat/working apron. 4. Remove wristwatch, ring, bracelets etc. 5. The shop should be properly lit & well ventilated. 6. Keep the work area clean, dry, free from scrap, hot items, oil spillage etc. 7. Never operate any machine unless you know how to operate it. 8. Protect the eyes with goggles or screen during pouring operations. 9. Use hand gloves for handling hot/ sharp objects etc. 10. Handle hot pieces with tong. 11. Hot metals should be kept away from the body at a place where there is no danger of body contact by any person. 12. Grasp the ladle firmly & be sure it is well balanced while transporting molten metal. 13. Keep a clear space around the pouring area. 14. Do not touch a casting immediately after removing it from mould. 15. Use proper tools while working in the pouring area. 16. The moulding boxes should be properly lighted & ventilated to avoid bursting. 17. In case of any fire, the electric supply should be disconnected. 18. Must always know the position and operation of Fire Extinguisher & First Aid box in the shop. 19. In case of an accident immediately inform the instructor.</p>

D3. Project Laboratory/Research Laboratory

Table No. 7.5.1: List of project laboratory/research laboratory /Centre of Excellence.

S.N.	Name of the Laboratory
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1.	<p>Centre of Excellence for Modelling and Simulation:</p> <p>Details:</p> <p>Processor: 12th Gen Intel(R) Core (TM) i5-12400 2.50 Ghz, 6 Physical Cores 12 Virtual Cores</p> <p>RAM: 8.00 GB</p> <p>Operating System: Windows 11 Home Single Language</p> <p>Internal Disk: 512 GB SSD</p> <p>Software's: Libreoffice, Ansys Workbench 2024 R1, Windows Subsystem for Linux with Ubuntu, Oracle VirtualBox, Ubuntu 22.04 LTS in VirtualBox, Robot Operating System 2 Humble in Ubuntu 22.04 LTS in VirtualBox</p> <p>Utilization: The Centre of Excellence (CoE) for Modelling and Simulation is fully utilized throughout the academic calendar, ensuring 100% engagement for academic, research, and skill development purposes. The facility is strategically integrated into the departmental ecosystem to support curriculum delivery, project work, faculty research, and professional training.</p> <p>Modes of Utilization:</p> <ol style="list-style-type: none"> 1. Academic Course Delivery: The CoE is actively used to teach core and elective subjects that require simulation, CAD modeling, thermal analysis, and programming, such as: Programming for Engineering Problem Solving, Mathematical Models in Engineering, Object Oriented Programming, Heat Transfer, Fluid Mechanics, CAD/CAM etc. <p>Students perform simulation-based assignments and project demonstrations using ANSYS Workbench, Blender, and C++ in the CoE.</p> <ol style="list-style-type: none"> 2. Student Research Projects: The CoE supports student research and capstone projects involving simulation, thermal-fluid analysis, virtual prototyping, and robotics. 3. Faculty Research Activities: Faculty members utilize the CoE for their ongoing research in simulation. Software tools such as ANSYS Workbench and Linux-based platforms aid in simulation-driven research and experimental planning. 4. FDPs, STTPs, and Workshops: The CoE has been instrumental in organizing hands-on training programs and faculty development programs (FDPs) to upskill faculty and students. <p>Event Conducted under CoE:</p> <ol style="list-style-type: none"> 1. One-DAY Hands-on Workshop on Fundamentals of Ansys CFX Fluid Simulation, 11/05/22. 2. Two-Day Hands-on Workshop on Heat Transfer and Fluid Flow Simulation with Ansys CFX 14/12/22 and 21/01/23. 3. Two-Day Hands-on Workshop on Simulation with ANSYS Mechanical, 06-01-23 to 07/01/23. 4. One-Day Hands-on Workshop on DIRECT CAD MODELLING WITH ANSYS SPACECLAIM 04/03/23. 5. Five-Day Faculty Development Programme on BASICS OF CFD AND STRESS ANALYSIS WITH ANSYS WORKBENCH 26/06/23 to 30/06/23. 6. 1-Day Hands-On Workshop on Basics of CAD and Animation with Blender, 23/09/23. 7. 1 Day Faculty Development Program on Introduction to Open-Source Software, 16/03/24. 8. 5-Day Faculty Development Programme on Basics of Programming in C++ for Mechanical Engineers 25/06/24 to 29/06/24. <p>Publication:</p> <ol style="list-style-type: none"> 1. Singh, A., & Sharma, S. (2022). Performance of Savonius Rotors: A Review. ECS Transactions, 107(1), 6655. 2. Kumar, R. (2024). Impact of various cross-sectional flow passages on the performance of a solar-based thermal energy conversion system. Renewable Energy, 234, 121149 <p>Relevance to POs/PSOs:</p> <p>PO1: Engineering Knowledge – Enables students to apply simulation tools for solving complex engineering problems.</p> <p>PO2: Problem Analysis – Facilitates modeling, analysis, and simulation-based validation of engineering systems.</p>
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PO3: Design/Development of Solutions – Supports design of thermal and fluid systems using software like ANSYS and Blender.

PO5: Modern Tool Usage – Promotes hands-on learning with modern engineering tools and software platforms like ANSYS, Ubuntu, and ROS2.

PO12: Lifelong Learning – Regular FDPs and workshops nurture continual learning and upskilling.

PSO1: Develop skills in simulation, CAD modeling, and computational analysis relevant to mechanical systems.

PSO2: Apply modern software tools in solving problems related to mechanical system.

Centre of Excellence for Vertical Transportation:

CoE for VT comprises two specialized labs designed to provide hands-on and simulation-based learning experiences.

1. Mechanical Components Lab

This lab focuses on the physical aspects of vertical transportation systems. It features a lift shaft with two levels – Ground and First – where the complete operation of a lift system can be observed. This includes the opening and closing of doors, as well as the downward and upward movement of the lift cabin. The setup enables detailed study and maintenance of every mechanical component involved in lift operations.

2. Simulator Lab

The simulation-based lab that replicates the functional aspects of vertical transportation using software-driven simulators. This lab has three different simulators, each equipped with different motor types and mechanisms for door operation.

The simulation software demonstrates the full functionality and control logic of elevator systems, allowing for practical understanding of electrical and control components. Also, the trouble shooting for electrical and electronic components can be practiced and done in the lab.

Together, these labs offer an integrated environment to study, maintain, and simulate all essential aspects of vertical transportation systems, bridging the gap between mechanical and electrical functionalities.

Selected Equipment's: Shaft simulator, Mechanical shaft, Car and landing door miniature setup, Various motors for elevators, Standalone shaft simulator with door functioning

2. Utilization: Centre of Excellence for Vertical Transportation is utilized for academic learning, hands-on training, faculty development, and industry-oriented sessions.

Event Detail:

1. Panel Discussion on Introduction to Vertical Transportation Lab and its Future Activities (03-12-2022).
2. Expert Talk on Fundamentals and Innovation of Vertical Transportation (19-12-2022).
3. Expert Talk on Critical Design Aspects and New Trends in Modern Smart Elevators (17-02-2023).
4. Hands-on Training on Innovation Technologies in field of Vertical Transportation (22-03-2024).
5. Refresher Training on Electrical Simulator (17-03-2025 to 21-03-2025).

Relevance to POs/PSOs:

PO1: Engineering Knowledge – Offers a platform to understand mechanical and control systems in elevators.

PO3: Design/Development of Solutions – Enables practical understanding of design and operation of VT systems.

PO4: Conduct Investigations – Allows investigation of mechanical and electrical components in real-world simulations.

PO5: Modern Tool Usage – Students and faculty use simulators and software tools for functional demonstration and analysis.

PO6: Engineer and Society – Raises awareness about safety and reliability of elevator systems in society.

PO11: Project Management and Finance – Through real-time projects and exposure to control systems.

PSO2: Use hands-on simulators to troubleshoot, analyze, and design elevator systems.

3.	<p>Project Lab (SAEINDIA):</p> <p>The SAE Project Lab at Chitkara University serves as the central hub for innovation, design, and development in automotive engineering. This state-of-the-art facility provides students with the infrastructure and technical support to conceptualize and fabricate vehicles for national-level SAEINDIA competitions. The lab is equipped with advanced tools and machinery required for design validation, analysis, manufacturing, and assembly, fostering a strong hands-on learning environment.</p> <p>Within this ecosystem, the Chitkara Collegiate Club under SAEINDIA plays a pivotal role in managing and organizing activities that contribute to the holistic development of students. The club comprises 60 to 70 active student members annually from diverse disciplines. These students work in close collaboration across different technical verticals such as chassis, powertrain, suspension, brakes, electronics, and telemetry systems.</p> <p>Among the major highlights of the club's activities are its consistent participation in SAEINDIA's flagship competitions.</p> <ul style="list-style-type: none"> • In 2023, a team of 18 multidisciplinary students represented Chitkara University at the mBaja 2023 event held in Indore, Madhya Pradesh, from 15th to 18th February. Demonstrating their engineering expertise and teamwork, the team competed with institutions across India. • Continuing this legacy, in March 2024, a contingent of 25 students took part in the eBaja 2024 competition at BVRIT Hyderabad from 6th to 9th March, showcasing an electric All-Terrain Vehicle (ATV) designed and developed entirely in the SAE Project Lab. <p>These events not only test the technical knowledge of students but also enhance their leadership, project management, and collaboration skills—making them industry-ready professionals.</p> <p>Utilization:</p> <p>The SAEINDIA Project Lab at Chitkara University is utilized 100% throughout the academic year for hands-on vehicle design, fabrication, and testing activities. It supports student participation in national-level competitions like mBaja and eBaja, promoting experiential learning and interdisciplinary collaboration.</p> <p>Annually, 60–70 students actively engage in design, manufacturing, and performance testing of ATVs, working in teams across key areas such as chassis, suspension, powertrain, electronics, and brakes. Notable achievements include participation in mBaja 2023 (Indore) and eBaja 2024 (Hyderabad), where student-designed vehicles were showcased.</p> <p>The lab also supports final-year and mini-projects, encouraging innovation and practical application of engineering knowledge. It enhances skills in project management, teamwork, and communication, making students industry-ready.</p> <p>Relevance to POs/PSOs:</p> <p>PO1: Engineering Knowledge – Application of multi-disciplinary concepts in vehicle design and fabrication.</p> <p>PO3: Design/Development of Solutions – Students conceptualize, design, and build real vehicles (mBaja/eBaja).</p> <p>PO5: Modern Tool Usage – Use of CAD, analysis, and prototyping tools in designing components.</p> <p>PO9: Individual and Team Work – Encourages strong teamwork and role distribution in student teams.</p> <p>PO10: Communication – Team participation in national competitions fosters communication and documentation skills.</p> <p>PO11: Project Management and Finance – Students handle budget, planning, procurement, and timelines during competitions.</p> <p>PO12: Lifelong Learning – Students gain experiential knowledge, adapting to evolving automotive technologies.</p> <p>PSO1: Acquire hands-on expertise in vehicle design, development, and testing.</p> <p>PSO2: Apply engineering principles for innovation and solution development in automotive system fabrication</p>
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4.

Research Lab:

Research Lab is fully utilized (100%) for advanced research, postgraduate thesis work, PhD research, and scholarly publications. The lab houses state-of-the-art facilities, including a CNC Vertical Milling Machine and a Computerized VCR Research Engine, facilitating interdisciplinary research in manufacturing and IC engine performance.

Major Facilities & Outcomes:

CNC Vertical Milling Machine: Successfully supported 03 PhD completions, including below completed in 2021 to 2024:

Dr. Talvinder Singh (2021-22): Optimization of Tool Parameters in EN31 Alloy

Dr. Mohit Rana (2021-22): Evaluation of Surface Integrity and Chip Morphology

Computerized VCR Research Engine: Used for postgraduate thesis work:

ME Thesis (2023): Experimental Investigation of Engine's Performance, Combustion Characteristics, and Emissions with Ethanol-Gasoline Blends

Utilization Purposes:

- PhD and ME research work in machining and IC engines
- Experimental validation of optimization algorithms
- Publication of high-quality journal and conference papers
- Integration of research outputs into UG/PG teaching modules
- Promoting research culture among faculty and students

Publication:

- Sharma, V. K. (2025). Analyzing the correlation between tool vibration and flank wear in face milling of EN-31 steel employing the CRITIC approach. *International Journal on Interactive Design and Manufacturing (IJDeM)*, 19(2), 733-741.
- Singh, T., Sharma, V. K., Rana, M., & Singh, K. (2023). Face Milling of AISI 52100: Evaluation of Tool Performance and Surface Integrity. In *Emerging Trends in Mechanical and Industrial Engineering: Select Proceedings of ICETMIE 2022* (pp. 801-810). Singapore: Springer Nature Singapore.
- Rana, M., Singh, T., Sharma, V. K., Singh, K., & Aggarwal, P. (2023). TGRA-Based Optimization of Face Milling of AISI 52100 Alloy Steel for Surface Microhardness and Tool Life. In *Emerging Trends in Mechanical and Industrial Engineering: Select Proceedings of ICETMIE 2022* (pp. 663-675). Singapore: Springer Nature Singapore
- Singh, K., Sharma, V. K., Singh, T., Rana, M., & Goyal, R. (2023). Effect of Different MQL parameters on the surface quality of aluminum alloy during face milling. In *Emerging Trends in Mechanical and Industrial Engineering: Select Proceedings of ICETMIE 2022* (pp. 739-748). Singapore: Springer Nature Singapore.
- Singh, T., Rana, M., Singh, K., Sharma, V. K., & Dhaliwal, N. (2023). Comparative study of nano fluid lubricant in face milling through DFA approach. *Materials Today: Proceedings*.
- Singh, K., Sharma, V. K., Singh, T., Rana, M., Goyal, R., & Rana, A. (2023). Investigation of Al-6061 alloy in face milling through DFA approach. *Materials Today: Proceedings*.
- Sharma, V. K., Singh, T., Rana, M., Singh, A. K., & Chattopadhyay, K. (2022). Experimental investigation of tool wear in face milling of EN-31 steel under different machining environments. *Materials Today: Proceedings*, 50, 2135-2142.
- Sharma, V. K., Singh, T., Rana, M., & Singh, K. (2022). Multi-output optimization during MQL based face milling of EN-31 steel employing Taguchi coupled grey relational analysis. *Materials Today: Proceedings*, 65, 3216-3223.
- Singh, K., Sharma, V. K., Singh, T., Singh, A. K., & Singh, R. (2022). Correlating surface roughness with cutting temperature in face milling of Al-6061 using CRITIC approach. *Materials Today: Proceedings*, 69, 333-338.
- Sharma, V. K., Singh, T., Rana, M., Singh, A. K., & Chattopadhyay, K. (2022). Experimental investigation of tool wear in face milling of EN-31 steel under different machining environments. *Materials Today: Proceedings*, 50, 2135-2142.
- Rana, M., Singh, T., Saini, A., Singh, J., Sharma, V. K., Singh, M., & Rooprai, R. S. (2021). Multi response optimization of nozzle process parameters in MQL assisted face milling of AISI 52,100 alloy

steel using TGRA. Materials Today: Proceedings, 44, 3177-3182.

Relevance to POs/PSOs:

PO1: Engineering Knowledge – Facilitates research in advanced manufacturing and IC engines.

PO2: Problem Analysis – Supports analysis of mechanical performance through experimental methods.

PO4: Conduct Investigations – Enables postgraduate and PhD students to conduct meaningful experimental work.

PO5: Modern Tool Usage – CNC machines and VCR engines are used for testing, optimization, and simulation.

PO8: Ethics – Upholds research integrity in publications and thesis work.

PO12: Lifelong Learning – Promotes research mindset and continuous knowledge development among students and faculty.

PSO1: Conduct research in IC engine performance, machining, and tribology using experimental setups.



Figure 7.4.1: Centre of Excellence for Modelling and Simulation



Figure 7.4.2 (a): Centre of Excellence for Vertical Transportation: Mechanical Shaft (b) Car and landing door miniature setup



Figure 7.4.2 (b): Centre of Excellence for Vertical Transportation: Car and landing door miniature setup



Figure 7.4.3: Research Lab: CNC-VMC Machine



Figure 7.4.4: Computerized VCR Research Engine

PART E: First Year faculty and financial Resources

(Data to be filled in for the first year course faculty and budget allocation and utilization)

E1. First Year Student-Faculty Ratio (FYSFR)

Table No. E1.1: FYSFR details.

Year	Sanctioned intake of all UG programs (S4)	No. of required faculty (RF4= S4/20)	No. of faculty members in Basic Science Courses & Humanities and Social Sciences including Management courses (NS1)	No. of faculty members in Engineering Science Courses (NS2)	Percentage= No. of faculty members $((NS1*0.8) + (NS2*0.2)) / (\text{No. of required faculty (RF4)})$; Percentage= $((NS1*0.8) + (NS2*0.2)) / RF$
2022-23(CAYm2)	180	9	6	14	84

2023-24(CAYm1)	180	9	7	19	104
2024-25(CAY)	210	10	7	19	94

E2. Budget Allocation, Utilization, and Public Accounting at Institute Level

Table No. E2.1: Budget and actual expenditure incurred at Institute level.

Items	Budgeted in 2024-2025	Actual Expenses in 2024-2025 till	Budgeted in 2023-2024	Actual Expenses in 2023-2024 till	Budgeted in 2022-2023	Actual Expenses in 2022-2023 till	Budgeted in 2021-2022	Actual Expenses in 2021-2022 till
Infrastructure Built-Up	500000000	491423285	440000000	468554011	160000000	170302543	140000000	141918786
Library	45000000	42052184	35000000	33641747	20000000	15950276	13000000	13291897
Laboratory equipment	305000000	302310833	250000000	241848666	40000000	37941977	35000000	31618314
Teaching and non-teaching staff salary	1600000000	1530657338	1500000000	1495241073	1200000000	1158841743	920000000	891416725
Outreach Programs	270000000	264664394	180000000	211731515	150000000	148937204	70000000	72921982
R&D	550000000	523467818	500000000	472759318	380000000	371954465	280000000	292895803
Training, Placement and Industry linkage	450000000	433561040	350000000	358314909	186000000	185839279	81000000	94469255
SDGs	21000000	20513546	20000000	17685205	12000000	11464001	20000000	9553334
Entrepreneurship	25000000	24519732	21500000	22820204	20000000	22632248	22200000	22193540
Others, specify	1684000000	1772593561	1503500000	1429510936	1282000000	1322768583	518800000	518973819
Total	5450000000	5405763731	4800000000	4752107584	3450000000	3446632319	2100000000	2089253455

E3. Budget Allocation, Utilization, and Public Accounting at Program Specific Level

Table No. E3.1: Budget and actual expenditure incurred at program level.

Items	Budgeted in 2024-2025	Actual Expenses in 2024-2025 till	Budgeted in 2023-2024	Actual Expenses in 2023-2024 till	Budgeted in 2022-2023	Actual Expenses in 2022-2023 till	Budgeted in 2021-2022	Actual Expenses in 2021-2022 till
Laboratory equipment	800000	663504	3000000	2969820	500000	485009	150000	131709
Software	320000	316771	100000	87462	310000	305152	110000	102304
SDGs	1000000	945037	800000	786258	725000	724784	505000	504780
Support for faculty development	1000000	747212	1000000	842087	600000	542679	450000	345127

R & D	6800000	6559074	6000000	5352920	1400000	1285428	950000	738249
Industrial Training, Industry expert, Internship	500000	438400	500000	378900	250000	223400	280000	275954
Miscellaneous Expenses*	15080000	14758908	14100000	13938948	21215000	20595888	22555000	22026948
Total	25500000	24428906	25500000	24356395	25000000	24162340	25000000	24125071