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: 10818	**Date of Submission**: 01-09-2025

PART A- Profile of the Institute

A1.Name of the Institute: MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY	
Year of Establishment : 1960	Location of the Institute: TT NAGAR BHOPAL
A2. Institute Address:MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL (INDIA)	
City:BHOPAL	State:Madhya Pradesh
Pin Code:462051	Website:WWW.MANIT.AC.IN
Email:DIRECTOR@MANIT.AC.IN	Phone No(with STD Code):0755-2670900
A3. Name and Address of the Affiliating University (if any):	
Name of the University : NIL	City: Bhopal
State : Madhya Pradesh	Pin Code: 462003
A4. Type of the Institution: NIT	
A5. Ownership Status: Central Government	

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

- No. of UG programs: **9**
- No. of PG programs: **35**

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	Architecture	UG	Architecture	1963	--	Architecture
2	Architecture	UG	Bachelor of Planning	2007	--	Architecture
3	Architecture	PG	M. Planning (Housing)	2012	--	Architecture
4	Architecture	PG	Urban Planning	2011	--	Architecture
5	Computer Application	PG	Master of Computer Application	1987	--	Computer Application
6	Engineering & Technology	PG	Advanced Computing	2012	--	Computer Science and Engineering
7	Engineering & Technology	PG	Agile Software Engineering	2022	--	Mathematics
8	Engineering & Technology	PG	Artificial Intelligence	2019	--	Centre for Artificial Intelligence
9	Engineering & Technology	PG	Automation & Robotics	2022	--	Mechanical Engineering
10	Engineering & Technology	PG	Bioinformatics	2006	--	Mathematics
11	Engineering & Technology	PG	Biotechnology	2012	--	Biological science & Engineering
12	Engineering & Technology	UG	Chemical Engineering	2007	--	Chemical Engineering
13	Engineering & Technology	PG	Chemical Engineering	2012	--	Chemical Engineering
14	Engineering & Technology	UG	Civil Engineering	1960	--	Civil Engineering
15	Engineering & Technology	PG	Communication Systems	2024	--	Electronics and Communication Engineering
16	Engineering & Technology	PG	Computer Networking	2012	--	Computer Science and Engineering
17	Engineering & Technology	UG	Computer Science and Engineering	1986	--	Computer Science and Engineering

18	Engineering & Technology	PG	Digital Communications	1989	2024	Electronics and Communication Engineering
19	Engineering & Technology	PG	Electrical Drives	2006	2024	Electrical Engineering
20	Engineering & Technology	UG	Electrical Engineering	1960	--	Electrical Engineering
21	Engineering & Technology	UG	Electronics & Communication Engineering	1972	--	Electronics and Communication Engineering
22	Engineering & Technology	PG	Energy Systems & Management	2018	--	Energy Centre
23	Engineering & Technology	PG	Environmental Engineering	2006	--	Civil Engineering
24	Engineering & Technology	PG	Geoinformatics and its Applications	2006	--	Civil Engineering
25	Engineering & Technology	PG	Geotechnical Engineering	1968	--	Civil Engineering
26	Engineering & Technology	PG	Hydro Power Engineering	1968	--	Civil Engineering
27	Engineering & Technology	PG	Industrial Design	1996	--	Mechanical Engineering
28	Engineering & Technology	PG	Industrial Engineering and Management	2022	--	Mechanical Engineering
29	Engineering & Technology	PG	Information Security	2006	--	Computer Science and Engineering
30	Engineering & Technology	PG	Intergrated Power Systems	2024	--	Electrical Engineering
31	Engineering & Technology	PG	Material Science & Technology	2012	--	Material Science and Technology
32	Engineering & Technology	PG	Mathematics and Data Science(Integrated/Dual)	2021	--	Mathematics
33	Engineering & Technology	UG	Mechanical Engineering	1960	--	Mechanical Engineering
34	Engineering & Technology	UG	Metallurgical & Materials Engineering	2007	--	Metallurgical and Materials Engineering
35	Engineering & Technology	PG	Power Electronics & Drives	2024	--	Electrical Engineering
36	Engineering & Technology	PG	Power Systems	1996	2024	Electrical Engineering
37	Engineering & Technology	PG	Renewable Energy	1997	--	Energy Engineering
38	Engineering & Technology	PG	Smart Manufacturing	2021	--	Centre of Excellence in Product Design and Smart Manufacturing
39	Engineering & Technology	PG	Structural Engineering	2006	--	Civil Engineering
40	Engineering & Technology	PG	Thermal Engineering	1996	--	Mechanical Engineering
41	Engineering & Technology	PG	Transportation Engineering	2007	--	Civil Engineering
42	Engineering & Technology	PG	VLSI Design & Embedded Systems	2006	--	Electronics and Communication Engineering
43	Engineering & Technology	PG	Water Resources Engineering and Management	2021	--	Civil Engineering
44	Management	PG	Master of Business Administration	2006	--	Management

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

Mechanical Engineering	No	Mechanical Engineering	UG
Civil Engineering	No	Civil 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/COMPE AUTHORITY ARROVAL DET
1	Mechanical Engineering	UG	1960 / --	60	Yes	2019	212	2019	NA

Sanctioned Intake for Last Five Years for the Automation & Robotics	
Academic Year	**Sanctioned Intake**
2024-25	212
2023-24	212
2022-23	212
2021-22	212
2020-21	212
2019-20	191

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 :	K.R. Aharwal
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)	212	212	212	212	212	219	200
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	207	212	200	204	210	194	175
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
N4=Total no. of students admitted in the 1st year via all supernumerary quotas	0	0	0	0	0	4	0

Total number of students admitted in the program (N1 + N2 + N3 + N4) - excluding those admitted through multiple entry and exit points.	207	212	200	204	210	198	175

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)	212	207	0	97.64
2023-24 (CAYm1)	212	212	0	100.00
2022-23 (CAYm2)	212	200	0	94.34

Average [(ER1 + ER2 + ER3) / 3] = 97.33≡ 20.00

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).	212.00	219.00	200.00
B=No. of students who graduated from the program in the stipulated course duration	189.00	188.00	174.00
Success Rate (SR)= (B/A) * 100	89.15	85.84	87.00

Average SR of three batches ((SR_1+ SR_2+ SR_3)/3): 87.33

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)	7.58	7.53	7.62
Y=Total no. of successful students	211.00	201.00	203.00
Z=Total no. of students appeared in the examination	211.00	201.00	203.00
API [X*(Y/Z)]	7.58	7.53	7.62

Average API[(AP1+AP2+AP3)/3] : 7.58

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 2rd year/10)	8.19	7.59	8.24
Y=Total no. of successful students	197.00	204.00	202.00
Z=Total no. of students appeared in the examination	200.00	204.00	202.00
API [X * (Y/Z)]	8.07	7.59	8.24

Average API [(AP1 + AP2 + AP3)/3] : 7.97

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)	8.04	8.16	7.97
Y=Total no. of successful students	203.00	200.00	192.00
Z=Total no. of students appeared in the examination	204.00	202.00	192.00
API [X*(Y/Z)]:	8.00	8.08	7.97

Average API [(AP1 + AP2 + AP3)/3] : 8.02

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	212.00	219.00	200.00

X=No. of students placed	169.00	158.00	136.00
Y=No. of students admitted to higher studies	2.00	3.00	0.00
Z= No. of students taking up entrepreneurship	7.00	0.00	0.00
Placement Index(P) = (((X + Y + Z)/FS) * 100):	83.96	73.52	68.00

Average Placement Index = (P_1 + P_2 + P_3)/3: 75.16 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)
1	K.R. Aharwal	XXXXXXX55K	Ph.D	IIT ROORKEE	Thermal engineering	02/06/2010	15	Associate Professor	Professor	28/12/2018	Regular
2	R.M. Sarviya	XXXXXXX96G	Ph.D	IIT ROORKEE	Thermal engineering	12/12/1987	37.6	Lecturer	Professor	04/06/2011	Regular
3	Siraj Ahmed	XXXXXXX01B	Ph.D	RGPV BHOPAL	Wind Energy	01/07/1992	33	Lecturer	Professor	04/06/2011	Regular
4	J.L. Bhagoria	XXXXXXX17R	Ph.D	IIT ROORKEE	Heat Transfer & Solar	01/07/1992	33	Lecturer	Professor	04/06/2011	Regular
5	S.P.S. Rajput	XXXXXXX61H	Ph.D	BU BHOPAL	Thermal engineering	26/07/1994	30.11	Lecturer	Professor	03/05/2013	Regular
6	Rajesh Gupta	XXXXXXX54C	Ph.D	MANIT BHOPAL	Heat Transfer& CFD	10/08/1994	30.10	Lecturer	Professor	28/12/2018	Regular
7	Rajesh Purohit	XXXXXXX47E	Ph.D	IIT DELHI	Materials	29/06/2010	15	Associate Professor	Professor	28/12/2018	Regular
8	R.K. Dwivedi	XXXXXXX88C	Ph.D	MANIT BHOPAL	Production	17/04/1995	30.3	Lecturer	Professor	24/02/2020	Regular
9	C.M. Krishna	XXXXXXX61R	Ph.D	IIT Kharagpur	Industrial Engineering	02/08/2010	14.10	Associate Professor	Professor	24/02/2020	Regular
10	V.K. Soni	XXXXXXX65L	Ph.D	MANIT BHOPAL	Industrial Engineering	31/01/2003	22.5	Lecturer	Professor	21/12/2023	Regular
11	Atul Lanjewar	XXXXXXX86Q	Ph.D	MANIT BHOPAL	Renewable Energy	13/02/2003	22.4	Lecturer	Professor	21/12/2023	Regular
12	Vilas Warudkar	XXXXXXX81C	Ph.D	MANIT BHOPAL	Machine Design, Wind	13/02/2003	22.4	Lecturer	Professor	24/12/2024	Regular
13	Manoj Arya	XXXXXXX22C	Ph.D	MANIT BHOPAL	Thermal engineering	15/07/2005	19.11	Lecturer	Associate Professor	31/12/2018	Regular
14	R.S. Rana	XXXXXXX22A	Ph.D	MANIT BHOPAL	Industrial Engineering	16/08/2003	21.10	Lecturer	Associate Professor	28/12/2018	Regular
15	Akhilesh Barve	XXXXXXX01G	Ph.D	IIT DELHI	Industrial Engineering	07/02/2019	6.4	Associate Professor	Professor	21/12/2023	Regular
16	Ajay Pandey	XXXXXXX65B	Ph.D	MANIT BHOPAL	Ind. Design	15/07/2005	19.11	Lecturer	Associate Professor	21/12/2023	Regular
17	P.K. Soni	XXXXXXX34A	Ph.D	MANIT BHOPAL	Manufacturing	14/07/2005	20	Lecturer	Assistant Professor		Regular
18	Amit Telang	XXXXXXX34K	Ph.D	MANIT BHOPAL	Industrial Design	15/07/2005	20	Lecturer	Associate Professor	21/12/2023	Regular
19	Alok Singh	XXXXXXX81D	Ph.D	MANIT BHOPAL	Thermal	15/07/2005	20	Lecturer	Associate Professor	21/12/2023	Regular
20	Vishal Parashar	XXXXXXX27A	Ph.D	MANIT BHOPAL	Production Engineering	15/07/2005	20	Lecturer	Associate Professor	24/12/2024	Regular
21	Amit Suhane	XXXXXXX92E	Ph.D	MANIT BHOPAL	Tribology	18/07/2005	19.11	Lecturer	Associate Professor	24/12/2024	Regular

22	Akhilesh Soni	XXXXXXX41J	Ph.D	MANIT BHOPAL	Design	16/08/2005	19.11	Lecturer	Assistant Professor		Regular
23	Manish Vishvakarma	XXXXXXX76G	Ph.D	MANIT BHOPAL	Maintenance engineering and Production	22/08/2005	19.11	Lecturer	Associate Professor	24/12/2024	Regular
24	Arvind Kumar	XXXXXXX15G	Ph.D	MANIT BHOPAL	Thermal engineering	24/05/2010	15.2	Assistant Professor	Associate Professor	24/12/2024	Regular
25	Ajay Verma	XXXXXXX59E	Ph.D	RGPV BHOPAL	Industrial engineering	01/06/2010	15	Assistant Professor	Associate Professor	24/12/2024	Regular
26	Sudhanshu Kumar	XXXXXXX26F	Ph.D	SVNIT SURAT	Manufacturing	07/01/2019	6.5	Assistant Professor	Assistant Professor		Regular
27	Abhinav Varshney	XXXXXXX00F	Ph.D	IIT KANPUR	Materials	07/01/2019	6.5	Assistant Professor	Assistant Professor		Regular
28	Mohammad Taufik	XXXXXXX62G	Ph.D	IIITDM JABALPUR	Manufacturing	17/01/2019	6.5	Assistant Professor	Assistant Professor		Regular
29	Vinod Yadav	XXXXXXX55C	Ph.D	IIT Guwahati	Manufacturing	21/01/2019	6.5	Assistant Professor	Assistant Professor		Regular
30	Narendra Laxman Gajbhiye	XXXXXXX08M	Ph.D	IIT Kanpur	Thermal & Fluid Sciences	08/02/2019	6.4	Assistant Professor	Assistant Professor		Regular
31	Vijay Panchore	XXXXXXX69C	Ph.D	IISc Banglore	Mechanical Vibrations, FEM	04/03/2020	5.3	Assistant Professor	Assistant Professor		Regular
32	Deepak Kumar	XXXXXXX03Q	Ph.D	IIT Patna	Design and Solid Mechanics	16/03/2020	5.4	Assistant Professor	Assistant Professor		Regular
33	Vikash Kumar	XXXXXXX25L	Ph.D	NIT Jamshedpur	Thermal, Solar, Renewable energy	20/03/2020	5.3	Assistant Professor	Assistant Professor		Regular
34	Tikendra Nath Verma	XXXXXXX76R	Ph.D	NIT RAIPUR	Thermal engineering	03/06/2020	5	Assistant Professor	Associate Professor	21/12/2023	Regular
35	Emon Barua	XXXXXXX92N	Ph.D	NIT Silchar	Design, Materials Science and Biomaterials	29/12/2023	1.5	Assistant Professor	Assistant Professor		Regular
36	Soumya Ranjan Guru	XXXXXXX94R	Ph.D	IIT Kharagpur	Machine Design, Tribology	11/06/2024	1	Assistant Professor	Assistant Professor		Regular
37	Aningi Mokhalingam	XXXXXXX09M	Ph.D	IIT Kanpur	Machine Design	04/11/2024	0.8	Assistant Professor	Assistant Professor		Regular
38	Lalsingh Devsoth	XXXXXXX91B	Ph.D	IIT Hydrabad	Fluid Dynamics & CFD	24/10/2024	0.9	Assistant Professor	Assistant Professor		Regular
39	Ashish Das	XXXXXXX71J	Ph.D	MNNIT Alllahabad	Additive Manufacturing	23/01/2024	1.5	Assistant Professor	Assistant Professor		Regular
40	Jitendra Adhikari	XXXXXXX15G	Ph.D	IIT Mandi	Machine Learning	28/10/2024	0.9	Assistant Professor	Assistant Professor		Regular
41	Jayanth Kumar	XXXXXXX05K	Ph.D	NIT Trichi	Additive Manufacturing	02/01/2024	1.5	Assistant Professor	Assistant Professor		Regular
42	Gajendra Dixit	XXXXXXX84R	Ph.D	BU BHOPAL	Materials	28/12/1982	41.6	Lecturer	Professor	22/01/2003	Regular
43	Siddhant Shrivastava	XXXXXXX58F	Ph.D	IIT Kanpur	Product Design	13/08/2024	0.11	Assistant Professor	Assistant Professor		Contractual Fulltime
44	R.K. Mandloi	XXXXXXX82M	Ph.D	MANIT BHOPAL	Automobile	04/04/1995	27.5	Lecturer	Professor	28/12/2018	Regular
45	Sanjay Soni	XXXXXXX72A	Ph.D	MANIT BHOPAL	Materials	22/10/1994	29.1	Lecturer	Associate Professor	23/10/2007	Regular
46	P.M. Mishra	XXXXXXX28R	Ph.D	MANIT BHOPAL	Industrial Engineering	15/07/2005	18.5	Assistant Professor	Assistant Professor		Regular
47	Mohan Kumar Pradhan	XXXXXXX03B	Ph.D	NITrourkela	Production Engineering	31/05/2010	13.4	Assistant Professor	Assistant Professor		Regular

48	Ravi Kumar Mandava	XXXXXXX78R	Ph.D	IIT BHUBANESWAR	Robotics	04/06/2020	2.9	Assistant Professor	Assistant Professor		Regular

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 Department4

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

Description	**CAY(2024-25)**	**CAYm1 (2023-24)**	**CAYm2 (2022-23)**
UG1.B	212	212	212
UG1.C	212	212	212
UG1.D	212	212	191
UG1: Mechanical Engineering	**636**	**636**	**615**
PG1.A	15	21	22
PG1.B	21	22	0
PG1: Automation & Robotics	**36**	**43**	**22**
PG2.A	21	21	22
PG2.B	21	22	21
PG2: Industrial Design	**42**	**43**	**43**
PG3.A	15	21	22
PG3.B	21	22	0
PG3: Industrial Engineering and Management	**36**	**43**	**22**
PG4.A	12	21	22
PG4.B	21	22	21
PG4: Thermal Engineering	**33**	**43**	**43**
DS=Total no. of students in all UG and PG programs in the Department	783	808	745
AS=Total no. of students of all UG and PG programs in allied departments	0	0	0
S=Total no. of students in the Department (DS) and allied departments (AS)	**S1=** 783	**S2=** 808	**S3=** 745
DF=Total no. of faculty members in the Department	39	35	38
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=** 39	**F2=** 35	**F3=** 38
FF=The faculty members in F who have a 100% teaching load in the first-year courses	0	0	0
Student Faculty Ratio (SFR)=S/(F-FF)	**SFR1= 20.08**	**SFR2= 23.09**	**SFR3= 19.61**
Average SFR for 3 years	**SFR= 20.93**		

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 x [(10X + 4Y) / RF)]**

2024-25(CAY)	39	0	39.00	25.00
2023-24(CAYm1)	35	0	40.00	21.88
2022-23(CAYm2)	38	0	37.00	25.68

C4. Faculty Cadre Proportion

- Faculty Cadre Proportion is 1(RF1): 2(RF2): 6(RF3)
- RF1= No. of Professors required = 1/9 * 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 * 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 * 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	4.00	12.00	8.00	7.00	26.00	19.00
2023-24	4.00	10.00	8.00	6.00	26.00	19.00
2022-23	4.00	10.00	8.00	7.00	24.00	21.00
Average	RF1=4.00	AF1=10.67	RF2=8.00	AF2=6.67	RF2=25.33	AF2=19.67

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	V K Jain	Professor	IIT Knapur	Additive Manufacturing	70.00

(CAYm2)

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	V K Jain	Professor	IIT Kanpur	Additive Manufacturing	60.00

(CAYm3)

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	V K Jain	Professor	IIT Kanpur	Additive Manufacturing	70.00

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	96	105	129
2	No. of peer reviewed conference papers published	42	31	21
3	No. of books/book chapters published	5	4	11

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
Dr. Sudhanshu Kumar		Mechanical Engineering	A Study of Learning Gap during Covid-19 Period among Government Elementary School Students	ICSSR, New Delhi	2 Years	5.50
Vijay Panchore		Mechanical Engineering	Aeroelastic Analysis and Stability Analysis of Helicopter Rotor Blade: Finite	SERB	2 Years	18.56
						Amount received (Rs.):24.06

(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. Vinod Yadav,	Dr. Akhilesh Barve	Mechanical Engineering	Development of PET waste plastic and bamboo-based composite tiles	Carbon Zero Challenge, IIT Madras	24 Months	5.00
Dr. Vinod Yadav		Mechanical Engineering	Manufacturing and Fabrication of Gasoline Engine-Based Saw Chain	Army Design Bureau, New Delhi	24 Months	22.00
Dr. Akhilesh Barve	, Dr. Deepak Kumar	Mechanical Engineering	Programmable Automated Field Deployable High-Frequency Rainwater Sampler	Indian Space Research Organization (ISRO)	24 Months	8.60
Dr. Deepak Kumar,	Dr. Vinod Yadav, Dr. Akhilesh Barve	Mechanical Engineering	Indigenously Developed Ankle CPM	BIRAC Govt. of India (E-Yuva Fellow Scheme)	24 Months	5.00
Dr. Sudhanshu Kumar		Mechanical Engineering	Generation of Accurate Bore Cavity by Developing an Algorithm in Electro Discharge Boring (EDB) Process	DST-SERB	2020 - Dec 2022	23.36
Dr. SPS Rajput		Mechanical Engineering	Indian Knowledge System Of Materials In Science And Technology	IKS Division, AICTE	24 Months	4.60
Dhakar Krishnakant	, Manoj Arya	Mechanical Engineering	Development and Experimental Investigation of Micro-Ultrasonic Form Machining	M.P. Council of Science & Technology	24 Months	4.95
Vishwakarma	Manish, Manoj Arya	Mechanical Engineering	Ancient Indian Skills: A Voyage of Bhartiya Gyan Parampara	Indian Knowledge Systems Division, Ministry of Education	24 Months	6.00
Dr. Gaurav Dwivedi,	Tikendra Nath Verma	Mechanical Engineering	Green Hydrogen Production Employing Waste Biomass	DST-Core Research Grant (CRG)	36 Months	27.93
Dr. Gaurav Dwivedi	Dr. Tikendra Nath Verma, Dr. Prashant Baredar	Mechanical Engineering	Enhancement of Cold Flow Properties of Waste Cooking Biodiesel and Diesel	M.P. Council of Science and Technology (MPCST)	12 Months	6.52
Vijay Duryodhan (PI),	Narendra Gajbhiye (Co-PI)	Mechanical Engineering	Development of Electrohydrodynamic Pump for Thermal Management of Electronic Devices	Science and Engineering Research Board (SERB)	36 Months	40.64
Narendra Gajbhiye		Mechanical Engineering	Numerical Investigation of MHD Flow and Pressure Drop in 3-D Sudden Expansion with Partitioned Channels Using Wall-Function Treatment	Science and Engineering Research Board (SERB)	36 Months	26.89
Vilas Wardukar	Narendra Gajbhiye (Co-PI), Anoop Arya (Co-PI), Pragati Agrawal (Co-PI)	Mechanical Engineering	Development of Miniaturized Pressure Regulator (Non-Moving Type) for Low Flow Rate Applications	Indian Space Research Organization (ISRO)	24 Months	12.27
Dr. Mohammad Taufik		Mechanical Engineering	Development of a UV-Assisted 3D Printing System for PCB Manufacturing	Indian Space Research Organization (ISRO)	24 Months	18.88
Dr. Rajesh Purohit		Mechanical Engineering	NIT, Patna	NIT, Patna	2 Months	0.30
Dr. Rajesh Purohit		Mechanical Engineering	na	UIT, RGPV, Bhopal	2 Months	0.30
Dr. J L Bhagoriya		Mechanical Engineering	Testing of Solar Air Collector	NIT, Patna	12 Months	0.85
Dr. Akhilesh Barve		Mechanical Engineering	Technical Viability of the use of RPC in manufacturing of ECP/Soderberg Paste	NOC Foundation	2 Months	0.35

Dr. Abhinav Varshney	Dr. Gajendra Dixit	Mechanical Engineering	NA	DST, New Delhi	30 Months	48.33
						Amount received (Rs.):262.77

(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
Abhinav Varshney	G. Dixit	Mechanical Engineering	Design and Development of an instrument for real time assessment of ferromagnetic phase fraction in ferrous alloys	DST	2.5 year	48.30
Akhilesh Barve	Ravi Kumar Mandava, Deepak Kumar	Mechanical Engineering	Programmable Automated Filed Deployable High Frequency Rainwater Sampler	ISRO	3 year	8.60
Mohammad Taufik		Mechanical Engineering	Development of a Pellet and Filament Form Integrated Multi-Material Co-Extruder System for Improved Additive Manufacturing Process	SERB-DST	2 year	17.63
Narendra Gajbhiye		Mechanical Engineering	Numerical investigation of MHD flow and pressure drop in 3-D sudden expansion with partitioned channels using wall-function treatment	SERB-DST	3 year	2.67
Vilas Warudkar	Narendra Gajbhye, Anoop Arya, Pragati Agarwal	Mechanical Engineering	Development of Miniaturized Pressure Regulators (Non-moving type) for low flow rate application	ISRO	3 year	12.67
						Amount received (Rs.):89.87

Total Amount (Lacs) Received for the Past 3 Years: 376.70

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. Ravindra Singh Rana	Dr. SPS Rajput	Mechanical Engineering	Inspection of Hook Loader, Machines, Containers used for composting waste for Smart City Gwalior	HYVA (India) Pvt. Ltd., Navi Mumbai	2 months	1.00
Dr. R. K. Dwivedi		Mechanical Engineering	Valuation of cast iron scrap material	Executive Engineer, Water Works, Nagar Nigam Bhopal	2 months	1.42
Dr. R. K. Dwivedi		Mechanical Engineering	Assessment of unused articles belonging to Kolar water supply & 1500mm diameter old pipes	Executive Engineer, Water Works, Nagar Nigam Bhopal	2 months	21.87
Dr. R. K. Dwivedi		Mechanical Engineering	Evaluation of unused items under Tilhan Sangh	Liquidator MP Tilhan Sangh	2 months	1.14
Dr. Akhilesh Barve		Mechanical Engineering	Third Party Study of Sustainability and Economy for Inviting Bids on Point to Point basis or Per MT Per KM basis in Road Transport Contract	FCI Bhopal	2 months	6.63
Dr. K. R. Aharwal		Mechanical Engineering	To provide the consultancy services for the implementation of technical standard of cold storage	National Hotricultute Board, Ministry of Agriculture,	2 months	8.54
Dr. K. R. Aharwal		Mechanical Engineering	Verification of sorting grading machine	M P State Agriculture Board	2 months	2.23
						Amount received (Rs.):42.83

(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. V. K. Soni		Mechanical Engineering	Third Party Study of Suitability and Economy for Inviting Bids on Point-to-Point basis or Per MT/KM basis	Food Corporation of India	6 months	5.62
Dr. K. R. Aharwal		Mechanical Engineering	To provide the consultancy services for the implementation of technical standard of cold storage	National Hotricultute Board, Ministry of Agriculture,	4 months	7.08
Dr. Rajesh Purohit		Mechanical Engineering	MP Jan Abhiyan Parishad, Bhopal	MP Government	2 months	1.06
Dr. R K Dwivedi		Mechanical Engineering	Municipal Corporation Bhopal	Govt. of MP	9 months	9.00
Dr. Manish Vishwakarma		Mechanical Engineering	LCC Project Pvt. Ltd., Ahmedabad, Gujarat	Private Firm	2 months	5.00
Dr. Manish Vishwakarma		Mechanical Engineering	LCC Project Pvt. Ltd., Ahmedabad, Gujarat	Private Firm	2 months	1.77
Dr. Manish Vishwakarma		Mechanical Engineering	LCC Project Pvt. Ltd., Ahmedabad, Gujarat	Private Firm	2 months	5.31
Dr. Amit Telang		Mechanical Engineering	Third-party inspection of pre-fabricated bus shelters, gym equipment, LED solar light	Hindustan Fabricators Bhopal, Mahalaxmi Industries, Sagar	5 months	2.63
Dr. Amit Telang		Mechanical Engineering	Third-party inspection of dual desk workbench with LAN cabling and other equipment	MP Laghu Udyog Nigam, Bhopal	9 months	15.67
Dr. Akhilesh Soni		Mechanical Engineering	Proof Checking/ Vetting of design document for tower type foundation	Universal Transformers, Bhopal	4 months	3.54
Dr. Akhilesh Barve		Mechanical Engineering	Third Party Study of Sustainability and Economy for Inviting Bids on Point-to-Point basis or Per MT Per KM basis in Road Transport Contract	Food Corporation of India	4 months	6.63
Dr. Deepak Kumar		Mechanical Engineering	Proof Checking of Structural Design of Solar Module Mounting Structure for PM KUSUM Component-B Project	Dynamech Electropower Pvt. Ltd. Bhopal	3 months	2.00
Dr. Vinod Yadav		Mechanical Engineering	Vetting of the DPR of water supply system under AMRUT 2.0	Cantonment Board, Saugor, Govt. of MP	2 months	2.00
Dr. R. K. Dwivedi		Mechanical Engineering	Price assessment of unusable articles of Nagar Palika Nigam, Ujjain	Nagar Palika Nigam, Ujjain	4 months	3.52
Dr. R. K. Dwivedi		Mechanical Engineering	Assessment of 1500mm diameter old water pipes	Nagar Nigam Bhopal	10 months	23.46
Dr.Anoop Arya	Dr. Mukesh Kirar & Dr. Manoj Arya	Mechanical Engineering	To finalise the specifications, sample testing, Tender evaluationand pre-delivery Inspection for the purchase of Audio-visual system, Projector and Screen	Jan Abhiyan Parishad (Govt. of M.P.), Bhopal	2 months	1.53
Dr. K.R.Aharwal	Dr. Manoj Arya	Mechanical Engineering	Implementation of Technical Standards for Cold storage chain Infrastructure for fresh food and vegetables	National Horticulture Board (Ministry of Agriculture and Farmer Welfare), Govt. of India, Gururam	10 months	9.44
						Amount received (Rs.):105.26

(CAYm3)

Total amount (Lacs) received for the past 3 years: 148.09

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
Dr. Emon Barua	Bone Scaffolds	1 year	5.25	5.17	Ongoing
			Amount received (Rs.): 5.25		

(CAYm2)

(CAYm3)

Total amount (Lacs) received for the past 3 years : 5.25

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	Heat and Mass Transfer Lab (HMT)	35	8	12	Mr. Bhanu Pr	Technician	BE
2	Refrigeration and Air Conditioning Lab (RAC)	35	8	12	Mr. Bhanu Pr	Technician	BE
3	Manufacturing Tech Lab -1	35	11	12	Mr. Pawan Pa	Technician	BTECH
4	Foundary Lab	35	3	12	Mr. Vishal Do	Technician	BE
5	Manufacturing Techniques Lab -II	35	7	12	Mr. Prakash (	Technical Ass	BTECH
6	Material Characterization Lab	35	4	12	Mr. Prakash (	Technical Ass	BTECH
7	Mechanics of Materials Lab	35	4	12	Mr Manish Ma	Technician	BE
8	Modelling, Simulation & Graphics Lab	35	2	12	Mr. Ankit Kum	Technician	PhD
9	I.C. Engine Lab	35	9	12	Mr. Prakash (	Technical Ass	BTECH
10	Turbomachine Lab	35	15	12	Mr. Bhanu Pr	Technician	BE
11	Metrology & Measurement Lab	35	10	12	Mr. Vishal Do	Technician	BE
12	CNC Lab	35	6	12	Mr. Prakash (	Technical Ass	BTECH
13	Vibration Lab	4	2	12	Mr Manish Ma	Technician	BTECH
14	Advance Machine & Additive Manufacturing Lab	18	3	12	Shri R.K. Shu	Technical Ass	BTECH
15	Heat Engines Lab	35	25	12	Mr. Bhanu Pr	Technician	BE
16	Mechanism of Machine Lab	35	26	12	Shri R.K. Shu	Technical Ass	BTECH

D2. Safety Measures in Laboratories

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

Sr. No	Laboratory Name	Safety Measures
1	Heat and Mass Transfer Lab. (HMT)	1) Always wear shoes before entering in the lab. 2) Do not touch anything without the permission of the Lab Technician. 3) Read carefully the lab manual before performing experiments. 4) Do not tamper with measuring instruments. 5) Do not open the casing of the equipment. 6) Switch off the power supply to the experimental setup on completion of the experiment. 7) Maintain clean and orderly laboratories and work areas. 8) Be aware of the various experiment controls (start button, stop button, speed control) for each experiment. 9) Do not leave running equipment unattended. 10) Any injuries should be reported immediately for proper care.
2	Refrigeration and Air Conditioning Lab. (RAC)	1) Ensure all connections (electrical and refrigerant lines) are secure before operation. 2) Do not touch compressor, condenser, or piping during or immediately after operation due to high temperatures. 3) Be cautious of refrigerant leaks — ensure good ventilation and avoid inhalation. 4) Check pressure gauges before starting; avoid operating at high pressures beyond limits. 5) Handle lithium bromide or ammonia-based systems with caution (if used). 6) Avoid direct contact with absorbent chemicals or refrigerants. 7) Never open system valves during operation. 8) Allow sufficient time for cooling before performing any maintenance or inspections. 9) Do not touch hot or cold coils without thermal gloves. 10) Pre-check all gauges, electrical switches, fluid levels, and valves before starting.
3	Manufacturing Tech-1 Lab	1) Always wear apron along with shoes while working in workshop. 2) Never wear necktie, loose sweater, wristwatch, bangles, rings, and loose fitting clothing while working in workshop. 3) Do not keep your belongings near working area. 4) Always use prescribed safety wears, protective clothing's, safety mask, hand gloves, safety goggles etc as per instructions. 5) Do not leave the machine on even after the power is off and until it has 6) Stopped running completely. 7) Do not oil, clean, adjust or repair any machine while it is running. Stop 8) The machine and lock the power switch in the off position. 9) Do not operate any machine unless authorized to do so by the authorize person in the shop. 10) Always check that work and cutting tools on any machine are clamped 11) Securely before starting. 12) The floor should be kept clean and clear of metal chips or curls and 13) Wastë pieces. Put them in the container provided for such things. 14) Defective guards must be replaced or repaired immediately.
4	Foundry Lab	1) Always Wear an Apron Along With Shoes While Working In a Workshop. 2) Never Wear a Necktie, a Loose Sweater, a Wristwatch, Bangles, Rings, or Fitting Clothing While Working In a Workshop. 3) Do Not Keep Your Belongings Near the Working Area. 4) Always Use Prescribed Safety Wear, Protective Clothing, Safety Mask, Hand Gloves, Safety Goggles, etc., As Per Instructions. 5) Do Not Leave The Machine On Even After The Power Is Off And Until It Has 6) Stopped Running Completely. 7) Do Not Oil, Clean, Adjust Or Repair Any Machine While It Is Running. Stop 8) The Machine And Lock The Power Switch In The Off Position.
5	Manufacturing Techniques -II Lab.	1) Always wear apron along with shoes while working in workshop. 2) Never wear necktie, loose sweater, wristwatch, bangles, rings, and loose fitting clothing while working in workshop. 3) Do not keep your belongings near working area. 4) Always use prescribed safety wears, protective clothing's, safety mask, hand gloves, safety goggles etc as per instructions. (5)do not leave the machine on even after the power is off and until it has 5) Stopped running completely. 6) Do not oil, clean, adjust or repair any machine while it is running. Stop 7) The machine and lock the power switch in the off position. 8) Do not operate any machine unless authorized to do so by the authorize person in the shop. 9) Always check that work and cutting tools on any machine are clamped 10) Securely before starting. 11) The floor should be kept clean and clear of metal chips or curls and 12) Waste pieces. Put them in the container provided for such things. 13) Defective guards must be replaced or repaired immediately.

6	Material Characterization Lab	1) Personal Protective Equipment (PPE): • Lab coat: Wear a lab coat with full sleeves to protect skin from splashes and spills. • Safety goggles/glasses: Protect eyes from chemical splashes and dust. • Gloves: Wear appropriate gloves (e.g., nitrile, latex) when handling chemicals, especially those that may cause skin irritation or sensitization. • Closed-toe shoes: Protect feet from chemical spills and sharp objects. 2) Handling Chemicals: • Labeling: Ensure all chemical containers are properly labeled. • Double-check labels: Before using any chemical, double-check the label to ensure you are using the correct substance. • Avoid direct contact: Never taste or smell chemicals directly. If you need to smell a chemical, waft a small amount of vapor towards your nose. 3) Disposal of Waste: • Chemical waste: Dispose of chemical waste in designated containers, according to lab safety guidelines. • Sharp objects: Dispose of sharp objects (e.g., broken glass, needles) in puncture-proof containers. 4) Equipment Safety: • Familiarize yourself: Understand the operation and safety precautions of all equipment you will be using. • Regular maintenance: Ensure equipment is properly maintained and inspected.
7	Mechanics of Material Lab	1) Always follow the experiment instructions precisely. 2) Wear the appropriate lab attire. 3) Never work in the lab without supervision. 4) Know the location of first aid kits, fire extinguishers, and emergency contacts. 5) Use the lab only when a qualified person (demonstrator, teaching assistant) is present. 6) Return all instruments carefully when the experiment is complete. 7) Obtain power supply only through the lab technician. 8) Ensure all machines are in working condition before use. 9) Follow machine instructions carefully and be aware of controls like start, stop, and speed. 10) Do not attempt to repair faulty instruments.
8	Heat Engines Lab	1) Only trained personnel and students under supervision are allowed. 2) Lab coat, safety goggles, and closed-toe shoes are mandatory. 3) No loose clothing or accessories while operating rotating or heated models. 4) Ensure availability of fire extinguishers (CO_2 and dry chemical type). 5) Clearly mark and make accessible emergency shut-off switches. 6) First aid kit and emergency contact list must be visible. 7) Check for exposed wires or faulty plugs before powering any model. 8) Avoid wet hands or surfaces while operating electrical panels.
9	Modelling, Simulation & Graphics Lab	1) Adjust chairs and monitor height to prevent neck and back strain. 2) Maintain good posture and take short breaks every 45–60 minutes. 3) Use only designated sockets for power; avoid using external extension boards. 4) Do not switch off UPS or power sources without faculty permission. 5) Report any loose wires, overheating, or electrical sparks immediately. 6) Handle keyboards, mouse, and other peripherals gently. 7) Do not plug/unplug devices forcefully—inform lab technician if any issue arises.
10	I.C. Engine Lab	1) Handle fuel and lubricants cautiously; wear gloves if necessary. 2) Immediately report any leaks, strange noises, overheating, or equipment damage. 3) Do not touch moving belts, pulleys, fans, or rotating shafts. 4) Never fuel the engine while hot or during operation. 5) Do not modify engine configurations without faculty approval. 6) Verify fuel, oil, coolant levels. 7) Check all mechanical fasteners, electrical connections, and load sensors. 8) Clear the area of unnecessary tools and loose items.
11	Turbo machine Lab	1) Never bypass safety valves, pressure switches, or interlocks. 2) Do not touch rotating or hot parts while running. 3) No loose clothing, mobile phone use, or distractions in the lab. 4) No unauthorized fuel, water, or pressure input adjustments. 5) Safety goggles, heat-resistant gloves, safety shoes, and lab coats are mandatory. 6) Ear protection is required during compressor or turbine operation. 7) Ensure all steam lines are leak-proof before operation. 8) Never open steam valves rapidly—open slowly and in sequence. 9) Keep a safe distance from rotating shafts and couplings. 10) Do not touch steam pipes or casings immediately after use (they can cause burns).
12	Mechanism of Machine Lab	1) Never touch rotating or sliding parts during operation. 2) Do not apply external loads to models unless designed for it. 3) Do not disassemble models without faculty approval. 4) Avoid using motors or power sources on manual models. 5) Keep hands away from rotating shafts, gears, and cams. 6) Report any unusual vibration, noise, or mechanical obstruction immediately. 7) Handle all models with care to avoid misalignment or damage.
13	Metrology & Measurement Lab	1) Keep benches clean and clutter-free. 2) Avoid placing instruments on edges of tables. 3) Use cushioned pads or cloth under instruments to prevent damage. 4) Handle all precision tools with care; use both hands if needed. 5) Do not drop, scratch, or apply excessive force on measuring instruments. 6) Clean measuring surfaces before and after use. 7) Turn off power supply before connecting sensors or probes. 8) Avoid water or oil near electrical circuits or data acquisition systems. 9) Use grounded plugs and check insulation on wires.

14	Centre of Excellence for Product Design and Smart Manufacturing (CEPDSM)	1) Do not install unauthorized software or change configurations. 2) Save work regularly and maintain backups. 3) Avoid using personal drives without scanning for viruses. 4) Do not override machine safety features or interlocks. 5) Never leave machines operating unattended. 6) Attend safety briefing before using any new equipment. 7) Report any equipment malfunction or breakage immediately. 8) Log usage and condition of machines in the maintenance register. 9) Clean and reset the work area after completing experiments.
15	Nano-Composite Lab	1) Lab coat (preferably anti-static), gloves (nitrile for chemical work), and closed-toe shoes. 2) Safety goggles or face shields must be worn at all times. 3) Use a respirator mask or work inside a fume hood/glove box when handling nanomaterials in powder form. 4) Do not use damaged glassware, frayed cables, or expired chemicals. 5) Do not operate equipment when alone in the lab for high-risk tasks (e.g., furnace operation, solvent heating). 6) Immediately report accidents, spills, or equipment failures to the lab supervisor.
16	CNC Lab	1) Simulate the program using CAM software before uploading to CNC. 2) Dry-run the CNC program without material to check for errors. 3) Use proper G-code and M-code sequences with attention to feed/speed limits. 4) Never attempt to open the machine door or reach inside while it is in motion. 5) Do not touch hot or sharp machined parts immediately after cutting. 6) Avoid unauthorized USB devices or software on CNC controllers.
17	Robotics Lab	1) Do not place water bottles or food near robots or electronics. 2) Avoid sudden movements around active robots. 3) Always power off the robot before making hardware changes. 4) Check all joints, sensors, and power connections. 5) Calibrate the robot if required before execution. 6) Ensure the programming code is verified in simulation.
18	Non-Lubricant Lab	1) Ensure aware that high friction can generate sparks or smoke—ensure proper ventilation is in place. 2) Do not use flammable materials or wear flammable clothing in the lab. 3) Avoid inhaling fumes or dust generated during testing—wear a dust mask or use fume extractors if required. 4) Never apply any oil, grease, or lubricant unless explicitly instructed. 5) Do not bypass machine safety covers or interlocks. 6) Avoid using oversized or incorrect test specimens.
19	Vibration Lab	1) Do not operate any equipment without faculty approval. 2) Do not remove safety guards or interlocks. 3) Do not place loose items (tools, bags, books) near machines in motion. 4) Do not tamper with sensors, data acquisition systems, or calibration settings. 5) Avoid manual excitation unless directed; use vibration exciters where provided.
20	Advance Refrigeration Lab	1) Prevent direct skin contact with any refrigerants or absorbent chemicals. 2) Do not open any system valves while the unit is in operation. 3) Allow the system to cool adequately before performing maintenance or inspection tasks. 4) Wear thermal protective gloves when handling hot or cold coils. 5) Conduct a thorough pre-start inspection, including checking gauges, switches, fluid levels, and valves. 6) Be alert to potential refrigerant leaks. Maintain good ventilation and avoid inhaling refrigerant vapors.
21	Advanced Heat Transfer Lab	1) Never leave an experiment running unattended. 2) Turn off the power supply to the experimental setup after completing the experiment. 3) Keep the laboratory and work area clean and well-organized at all times. 4) Carefully read the laboratory manual before beginning any experiment. 5) Keep the laboratory and work area clean and well-organized at all times.
22	Advance Machine & Additive Manufacturing Lab	1) Inspect all machines and additive manufacturing equipment (FDM, SLA, SLS, etc.) for proper working condition before use. 2) Verify tool alignment, power connections, material loading, and emergency stop buttons. 3) Store resins, filaments, and powders (especially photopolymers or metal powders) as per manufacturer’s guidelines. 4) Avoid skin contact or inhalation; use material-specific PPE where necessary. 5) Dispose of waste materials in designated containers.
23	Biomaterial Lab	1) Use biohazard containers for disposal of biological waste. 2) Work with biohazardous materials only under proper biosafety cabinets. 3) Maintain aseptic conditions while handling biomaterials to prevent contamination. 4) Dispose of used needles, scalpels, or broken glassware in designated sharps containers. 5) Avoid unnecessary movement or distractions during experimental work.
24	Mechatronics Lab	1) Ensure all pneumatic connections are secure before powering the system. 2) Do not exceed the recommended air pressure limits in the pneumatic setup. 3) Always disconnect power supply before modifying any PLC wiring or circuits. 4) Wear safety goggles and avoid loose clothing around moving actuators. 5) Use FluidSim software for simulation first to verify logic before hardware implementation.

D3. Project Laboratory/Research Laboratory

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

S.No.	Name of the Laboratory	List of Equipment	Purpose of Laboratory
1	**Project-based Lab.** **(Robotics Lab)**	1) Six-axis robot, 2) Rigid circular and rectangular frame, 1) LCR meter (High voltage power supply)	This lab is dedicated to automation, robot motion control, and kinematic experimentation. With six-axis robots and control frames, it supports learning of industrial robotics and high-voltage system integration. It enables practical implementation of robotic systems for manufacturing.
2	**Centre of Excellence for Product Design and Smart Manufacturing (CEPDSM)**	1) Selective Laser Sintering 2) Stereo Lithography 3) Laser Engraving Machine 4) Pneumatic & Electropneumatic trainer Kit 5) Hydraulic Trainer Kit	This center promotes interdisciplinary innovation in smart product design and digital manufacturing. It focuses on Industry 4.0 tools, prototyping, and design validation. It serves as a hub for advanced CAD, IoT-enabled production systems, and design optimization.
3	**Nano-Composite Lab.**	1) Compression Moulding Machine 2) Heat Deflection Tester 3) Ultrasonic Bath 4) Vacuum Oven 5) Pin-on-Disc Wear testing Machine 6) Ultrasonic Assisted Stir Casting Machine 7) Automatic Wire Extrusion Line 8) Programmable Controlled Atmosphere Furnace 9) Agglomerator	This lab focuses on the fabrication, testing, and processing of polymer-based and metal-matrix nano-composites. It enables advanced material synthesis using ultrasonic-assisted stir casting and controlled atmosphere furnaces. The lab also facilitates evaluation of wear, thermal, and mechanical behavior of composite materials.
4	**Non-Lubricant Lab.**	1) Optical microscope 2) Digital viscometer 3) Weighing balance 4) Magnetic stirrer 5) Hot air oven 6) Four-ball tester 7) Air jet erosion tester	The lab facilitates the study of dry and advanced lubrication systems. It includes tribological testing equipment like a four-ball tester and air jet erosion tester to evaluate material performance under non-lubricated conditions. It supports research in environmentally friendly tribo-materials and coatings.
5	**Advance Refrigeration Lab.**	1) Post-Harvest Research Chamber. 2) Cold Room with positive and negative temperature units 3) CO2 scrubber 4) N2 generator	The lab aims to support cold chain and refrigeration research, especially in agricultural and post-harvest technology. It features controlled chambers and gas scrubbers to study environmental control. Applications include food preservation, transport cooling, and cryogenic systems.
6	**Advanced Heat Transfer Lab.**	1) Solar Air Heater 2) With LCT set up. 3) CCD camera 4) TLC sheet 5) Work Station	This lab is equipped to investigate thermal performance in renewable and enhanced heat transfer systems. Tools like solar air heaters, CCD cameras, and TLC sheets enable visualization and quantification of heat flow. It supports sustainable energy and thermal design research.

7	**Biomaterial Lab.**	1) Ultrasonic Probe Sonicator 2) High Temperature Muffle furnace (1100℃) 3) Laboratory Hot air oven 4) Magnetic Stirrer with Hot Plate	The lab specializes in the synthesis and characterization of bio-compatible materials for medical and industrial use. Equipment like ultrasonic sonicators and high-temperature furnaces support nanoparticle dispersion and material treatment. It aids in developing coatings, implants, and biodegradable composites.
8	**Mechatronics Lab.**	1) Basic Pneumatic set-up with PLC and electro-pneumatics and fluid sim software	The Mechatronics Lab is designed to provide hands-on experience in automation and control systems by integrating mechanical, electrical, and computer engineering concepts. It features a basic pneumatic set-up with PLC and electro-pneumatics, allowing students to simulate and control industrial automation processes. The inclusion of FluidSim software enhances understanding of circuit design, logic programming, and system behavior through virtual experimentation.

The department has established **well-equipped project and research laboratories** to foster innovation, interdisciplinary learning, and hands-on research among students and faculty. The **Project-based Robotics Lab** provides state-of-the-art infrastructure for automation, motion control, and robotic kinematics, featuring six-axis robots, high-voltage LCR meters, and control frames. It enables students to design, simulate, and implement industrial robotic systems relevant to modern manufacturing environments.

The **Centre of Excellence for Product Design and Smart Manufacturing (CEPDSM)** serves as a premier hub for research and innovation in **Industry 4.0 technologies**, equipped with advanced systems such as Selective Laser Sintering, Stereolithography, and pneumatic-hydraulic trainer kits. It supports projects on digital manufacturing, product design optimization, and IoT-enabled production systems. The **Nano-Composite Lab** focuses on **fabrication and testing of polymer-based and metal-matrix composites**, using advanced instruments like ultrasonic stir casting machines, programmable atmosphere furnaces, and wear testing machines for material performance evaluation.

Further, the **Non-Lubricant Lab** enables research on **tribology and advanced lubrication systems,** while the **Advanced Refrigeration and Heat Transfer Labs** facilitate cutting-edge research in **cold chain technology, renewable energy systems, and enhanced thermal designs.** Specialized facilities like the **Biomaterial Lab** and **Mechatronics Lab** extend research to **bio-compatible materials, medical coatings, automation, and PLC-based control systems.**

The department has an established **Centre of Excellence for Product Design and Smart Manufacturing (CEPDSM),** which serves as a premier platform for innovation, research, and skill development in **Industry 4.0 technologies.** The centre is equipped with cutting-edge facilities such as **Selective Laser Sintering, Stereolithography, Laser Engraving Machines, Hydraulic and Pneumatic Trainer Kits,** and other digital manufacturing systems. It promotes interdisciplinary learning and collaboration across design, automation, and advanced manufacturing domains.

The Centre focuses on integrating **CAD/CAM, IoT, robotics, additive manufacturing, and mechatronics** to provide students and researchers with real-time industrial exposure and opportunities to develop prototypes and optimized designs. It also acts as an incubation and training hub, encouraging students to undertake **industry-linked projects, internships, and research initiatives** in smart manufacturing and product design.

The **project laboratories, research laboratories, and Centre of Excellence** are effectively and extensively utilized to enhance experiential learning, research, and innovation among students and faculty. The **Project-based Robotics Lab** supports final-year and interdisciplinary projects focused on automation, robot motion control, and industrial robotics applications. The **Centre of Excellence for Product Design and Smart Manufacturing (CEPDSM)** is regularly used for prototype development, advanced CAD modeling, additive manufacturing, and digital production system training, aligning with **Industry 4.0** standards.

The **Nano-Composite Lab** and **Biomaterial Lab** are actively used by undergraduate, postgraduate, and doctoral students for research on advanced materials, including fabrication, mechanical testing, and characterization of nano-composites and bio-compatible materials. The **Advanced Refrigeration** and **Heat Transfer Labs** are utilized for project-based studies on sustainable energy, cold-chain systems, and thermal performance analysis. Similarly, the **Mechatronics and Non-Lubricant Labs** are used for PLC-based automation, tribological testing, and product reliability studies.

The **project laboratories, research laboratories, and Centre of Excellence** are highly relevant to the attainment of the **Program Outcomes (POs)** outlined by NBA. These facilities directly contribute to **PO1 (Engineering Knowledge)** and **PO2 (Problem Analysis)** by providing students with hands-on opportunities to apply theoretical concepts to real-world engineering problems. The use of advanced tools and technologies in the **Centre of Excellence for Product Design and Smart Manufacturing (CEPDSM)** strengthens **PO3 (Design/Development of Solutions)** and **PO5 (Engineering Tool Usage)** through exposure to cutting-edge equipment such as 3D printers, laser engravers, and pneumatic-hydraulic systems.

Moreover, these facilities foster **PO7 (Ethics), PO8 (Individual and Collaborative Team Work)** through collaborative project work, adherence to laboratory safety standards, and continuous learning via advanced simulation and digital manufacturing tools.

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))/(No. of required faculty (RF4)); Percentage= ((NS1*0.8) + (NS2*0.2))/RF
2022-23(CAYm2)	1203	60	33	37	56
2023-24(CAYm1)	1203	60	36	37	60
2024-25(CAY)	1203	60	48	45	79

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	150000000	123800000	330000000	324100000	150000000	123400000	1100000000	1010000000
Library	50000000	37300000	50000000	42500000	50000000	18300000	60000000	55000000
Laboratory equipment	326000000	217200000	320000000	318000000	100000000	92000000	130000000	125000000
Teaching and non-teaching staff	1143800000	1143800000	1017000000	1017000000	1017000000	1017000000	885000000	830000000
Outreach Programs	0	0	0	0	0	0	0	0
R&D	0	0	0	0	0	0	0	0
Training, Placement and	0	0	0	0	0	0	0	0
SDGs	0	0	0	0	0	0	0	0
Entrepreneurship	0	0	0	0	0	0	0	0
Others, specify	881600000	881600000	725300000	725300000	725300000	725300000	614000000	614000000
Total	**2551400000**	**2403700000**	**2442300000**	**2426900000**	**2042300000**	**1976000000**	**2789000000**	**2634000000**

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	60600000	26900000	75300000	34100000	4000000	3960000	2000000	2000000
Software	0	0	0	0	0	0	0	0
SDGs	0	0	0	0	0	0	0	0
Support for faculty development	0	0	0	0	0	0	0	0
R & D	2500000	2500000	500000	500000	0	0	0	0
Industrial Training, Industry expert,	0	0	0	0	0	0	0	0
Miscellaneous Expenses*	2000000	2000000	2000000	2500000	2000000	2000000	1000000	1000000
Total	**65100000**	**31400000**	**77800000**	**37100000**	**6000000**	**5960000**	**3000000**	**3000000**