# **ANNUAL REPORT** (2020 - 2021)



# **Department of Mechanical Engineering**

**Dr.Babasaheb Ambedkar Technological University** 

Lonere - 402 103, Dist- Raigad, Maharashtra (India)

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Dr. Neeraj Agrawal Professor and Head of Department, Mechanical Engineering

#### 1. MESSAGE FROM THE HEAD OF THE DEPARTMENT

With the great happiness and pleasure I herewith present the annual report card of the Department of Mechanical Engineering for the year 2020-21. The Department constantly strives towards excellence and has done the significant progress at all levels; academics, research, innovations and co-curricular activities. The Department strives with the vision to bring the research and innovations even at UG level and motivate the UG students for higher education. The academic spectrum and content delivery adopted by the Department is in-lined with the needs of the industry and profession.

To prepare the true professionals who can take the challenges of life and keep tune with the fast changing word and technologies, Department ensures and care the overall development of the students. Students are nurtured, trained and infused with latest technologies through the well-equipped laboratories and good academic ambience such as design work, project work, industrial training, professional society activities and team work. Department maintain and exhibits research culture through meaningful research and innovation carryout by the Faculty member by involving not only Ph.D. /M. Tech students but also B. Tech students.

Students are exposed and prepare for today's job market through expert lectures, visiting technical exhibitions, hands-on experience, model preparation, software learning etc. in addition to regular and rigorous class room teaching by the dedicated and experienced faculty. Students are also encouraged and assisted by the Department to take part in the national level events to enhance their vision. Department has successfully carried out teaching learning process in the most challenging time, COVID 19, through online classes. I take this opportunity to thank all of my learned colleagues and students for their untiring and wholehearted support to maintain the academic standards with the vision to make the Department a center of excellence in coming years. My best wishes to all the students in their future endeavour.

Dr. Neeraj Agrawal Head, Department of Mechanical Engineering

# 2. VISION AND MISSION STATEMENTS OF THE DEPARTMENT

#### Vision:

The vision of the department is to achieve excellence in teaching, learning, research and transfer of technology and overall development of students

#### **Mission:**

Imparting quality education, looking after holistic development of students and conducting need based research and extension.

# **3. ABOUT THE DEPARTMENT**

Established in the year 1992, the Department of Mechanical Engineering offers various academic programs, like B. Tech. (Mechanical Engineering), M. Tech. (Manufacturing Engineering), M. Tech. (Thermal & Fluids Engineering) and Ph.D. The department takes pride in its highly qualified and motivated faculty members most of whom are PhDs from IITs. The alumni of the Department have made a mark in industry and profession. Over the years, the department has maintained good academic and research culture. As a result, the faculty members in the department have published more than 600 papers in peer-reviewed international journals and conferences so far. Further, some of the laboratories have developed innovative products which are being patented for commercial usage. The Department has strong linkages with institutes like IIT Bombay and BARC. In addition, the Department has also conducted several continuing education programs (CEPs) and STTPs for the benefit of faculty and industry personnel.

# 4. PROGRAM EDUCATIONAL OBJECTIVES (PEOs) & PROGRAM OUTCOMES (POs)

	$\mathbf{O}$
PEO1	Graduates should excel in engineering positions in industry and other organizations that
TLOI	emphasize design and implementation of engineering systems and devices.
DEO2	Graduates should excel in best post-graduate engineering institutes, reaching advanced degrees
PEO2	in engineering and related discipline.
	Within several years from graduation, alumni should have established a successful career in an
DEO2	engineering-related multidisciplinary field, leading or participating effectively in
PEUS	interdisciplinary engineering projects, as well as continuously adapting to changing
	technologies.
	Graduates are expected to continue personal development through professional study and self-
PEO4	learning.
PEO5	Graduates are expected to be good citizens and cultured human beings, with full appreciation of
	the importance of professional, ethical and societal responsibilities.

#### **Program Educational Objectives (PEOs)**

#### **Program Outcomes (POs)**

PO1	Apply knowledge of mathematics, science and engineering to analyze, design and evaluate mechanical components and systems using state -of-the-art IT tools.
PO2	Analyze problems of mechanical engineering including thermal, manufacturing and industrial systems to formulate design requirements.
PO3	Design, implement, and evaluate mechanical systems and processes considering public health, safety, cultural, societal and environmental issues.
PO4	Design and conduct experiments using domain knowledge and analyze data to arrive at valid conclusions.
PO5	Apply current techniques, skills, knowledge and computer based methods & tools to develop mechanical systems.

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PO6	Analyze the local and global impact of modern technologies on individual organizations, society and culture.
PO7	Apply knowledge of contemporary issues to investigate and solve problems with a concern for sustainability and eco-friendly environment.
PO8	Exhibit responsibility in professional, ethical, legal, security and social issues.
PO9	Function effectively in teams, in diverse and multidisciplinary areas to accomplish common goals.
PO10	Communicate effectively in diverse groups and exhibit leadership qualities.
PO11	Apply management principles to manage projects in multidisciplinary environment.
PO12	Pursue life-long learning as a means to enhance knowledge and skills.

# 5. OVERVIEW OF ACADEMIC PROGRAMS

Academic Program		Duration	Intake
B. Tech Mechanical Engineering		Four Years	54
M. Tech	Manufacturing Engineering	Two Years	16
M. Tech	Thermal Engineering	Two Years	16
Ph. D.	Mechanical Engineering	NA	

# 5.1 UG Students Statistical Information

Year			Cate	egory Wi	ise Distrib	oution				Tota	l
	Open	OBC	VJNT	SC	ST	SBC	J&K	TFWS	Μ	F	Т
First	28	11	5	0	0	0	0	0	47	5	52
Second	36	17	10	10	2	1	0	0	68	8	76
Third	26	31	9	12	3	2	0	0	69	14	83
Four	18	26	11	11	4	1	0	0	55	16	71

# **5.2 Result Analysis**

B.Tech Pass Out Students' Data (CGPA)				
Pointer No. of Students				
8.0-10.0	49			
6.8-8	20			
<6.8	0			
Fail	0			
Total	69			



# **5.3 Campus Placements**

Following students from the department have got campus placement during academic year 2020-21 from Training and Placement Cell, DBATU.

Sr. No.	Name of Student	Name of the Company	CTC offered
1	Hrishikesh Joshi	TCS	3.36 LPA
2	AboliKulkarni	KPIT	3.6 LPA
3	GauravMhasalkar	TCS	3.36 LPA
4	Adarsh Singh	Infosys	3.6 LPA
5	MahendraDoifode	TCS	3.36 LPA
6	MeghaMagade	SoftboxPanvel	4.5 LPA
7	ParasmitaBiswas	SoftboxPanvel	4.5 LPA
8	Rohit Rahul mohite	Hypro Pune	2 LPA

#### 6. FACULTY AND STAFF



Dr. Neeraj Agrawal Post: Professor and Head of Department Education: B. Tech (Mechanical Engg.) M. Tech. (Ref. & AC, Mechanical Engg.) Ph.D. (Mechanical Engg.)



Dr. V.G. Sargade

Post: Professor

**Education**: B. Tech. (Mechanical Engg.)

M. Tech. (Mechanical Engg.) Ph. D. (Mechanical Engg.)



Dr. M. S. Tandale
Post: Professor

**Education**: B.E. (Mechanical Engg.)

M.Tech. (Mechanical Engg.)

Ph.D. (Mechanical Engg)

Dr. R. P. Kate

Post: Professor

**Education**:B. E. (Mechanical Engg.)

M. Tech. (Energy Systems Engg.)

Ph.D. (Mechanical Engg.)

Dr. B. F. Jogi

Post: Professor

**Education**:B.E. (Mechanical Engg.)

M. Tech. (Manufacturing Technology)

Ph.D. (Nano Materials)







Dr. H. N. Warhatkar

Post: Professor

**Education**:B. E. (Mechanical Engg.)

M. Tech. (Mechanical Engg.)

Ph. D. (Mechanical Engg.)





Post: Assistant Professor

**Education**: B.E. (Mechanical Engg.)

M. Tech (Thermal Engg.)

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fluid Engg.)

**Post:** Assistant Professor

**Education**: B.E.

(Mechanical Engg.)

M. Tech (Thermal and



Miss. Harsha Nathjogi

Post: Assistant Professor

**Education**: B.E. (Mechanical Engg.)

M. Tech (Thermal Engg.)





#### Mr. A. Patil

Post: Lab Assistant

**Education:** Diploma in Mechanical Engineering

Experience in dept: 9 years

# 7. ADDITIONAL RESPONSIBILITIES TO THE FACULTY

#### Dr. N. Agarwal

- Head, Mechanical Engineering Department.
- Training and Placement Officer

# Dr. M.S. Tandale

- CR Processing Officer.
- M.Tech Faculty Advisor.
- Dept Project Coordinator.
- Dean (SD)
- Lab In-charge, IC Engines Lab

# Dr. V.G. Sargade

- Dean, Students' Welfare
- Chairman, Standing Administrative Committee
- Coordinator, B. C. Cell of Affiliation
- Member of BoS



• Lab In-charge, Materials Science and Metallurgy Lab

#### Dr. M. Sadaiah

• Head, Mechanical Engineering Department.

#### Dr. R. S. Pawade

- Head Procurement University
- Coordinator, UGC Cell and Manufacturing Engineering
- Workshop Superintendent

#### Dr. H. N. Warhatkar

NSS Coordinator

#### Dr. B.F. Jogi

- I/C Registrar.
- OSD Affiliation as Joint Director Level
- Rector Sahyagiri and Gagangiri Boys Hostel

#### Dr. H.S. Joshi

- Coordinator, Technical Event Committee
- Chairman, University Alumni Cell

#### Dr. G. S. Warkhade

- Asso. Dean of Sports
- Procurement Head

#### Dr. D. B. Waghmare

• Rector, Sahyagiri Hostel

#### Prof. S. R. Dhale

- Departmental Coordinator: Alumni Activities
- Lab In-Charge: Metrology and Quality Control Lab

# 8. ADVISORY BOARD AND BOARD OF STUDIES (BoS)

#### **Advisory Board:**

- 1. Prof. N.V. Sahasrabudhe
- 2. Dr. S. M. Mane
- 3. Prof. Vijay Nyayadhish
- 4. Shri A. B. Joshi
- 5. Shri. Bhupesh Mall

#### **Board of Studies:**

- Dr. NeerajAgrawal ,Chairman
- Dr. V. G. Sargade, Member
- Dr. A Kumaraswamy, Member

- Dr. P. B. Maheshwary, Member
- Dr. Rahul Barjibhe,Invitee
- Dr. SanjeevSuryawanshi,Invitee
- Dr. R. D. Patil, Invitee
- Dr. DilipPangavhane,Invitee
- Dr. ShendageDadasaheb J.,Invitee

# 9. FACULTY RESEARCH AND PUBLICATIONS

#### 9.1 International Conference Publications

 Shrikant Thorat, Vinod Lonkar, Ashish Pailwan, Vikas Sargade, Mudigonda Sadaiah, Effect of metallurgical parameters induced by manuafacturing processes on photochemical machining of Co-Cr alloy, 20th CIRP Conference on Electro Physical and Chemical Machining, Procedia CIRP 95(2020) 149-154. DOI: 10.1016/j.procir.2020.01.204.

#### https://www.sciencedirect.com/science/article/pii/S221282712031578X

- 2. PravinJadhav, Agrawal N, Sahu A, Patil S, Aldar D, Tapase, A Influence of geometric and operating parameters on the performance of the helical capillary tube for the R744 refrigerant, 3rd Int. conf on Advances in Mechanical Engineering (ICMAE 2020), IOP Conf. Series: Materials Science and Engineering 912 (2020) 042046 IOP Publishing doi:10.1088/1757-899X/912/4/042046 https://iopscience.iop.org/article/10.1088/1757-899X/912/4/042046/meta
- 3. Bhagwan .F. Jogi, "Investigations of the 80/20 (wt/wt) PA6/ABS blends system in presence of SMA co-polymers as Reactive Compatibilizer and Encapsulated Multiwall Carbon Nanotubes (MWNTs)", presented at Technical Programme of International Online Conference on Nano Materials (ICN 2021) as Invited Lecture IL 47 on Ist Day of the Conference (09th April 2021), Hall 3 Organized by Mahatma Gandhi University, P.D Hills P.O, Kottayam, Kerala, India & Wroclaw University of Technology Wroclaw, Poland & Gdansk University of Technology Poland & Wuhan University China. http://www.journals.krispon.com/index.php/aicm/article/view/134
- 4. B.F. Jogi, presented a scientific paper entitled "Some Mechanical Studies on Poly-tetra-fluoroethylene (PTFE) filled compound" at the International Online Conference on Advanced Nano Materials, ICAN 2021 on 14th & 16th December, 2021 by Centre for Nano Science and Technology, Amal Jyothi College of Engineering and School of Energy Materials, Mahatma Gandhi University and Gdansk University of Technology, Kottayam.

https://journals.krispon.com/index.php/aicm/article/view/135

#### **9.2 International Journals**

1. Shrikant B. Thorat and Mudigonda Sadaiah, The relative influence of surface metallurgy and selfmagnetisation induced by different manufacturing processes on surface integrity of Co-Cr alloy using PCM, Materials Characterization, 167(2020) 110526,

https://doi.org/10.1016/j.matchar.2020.110526, Elsevier, Impact Factor: 3.43

2. Patil O P, S. Shet, M.Jadhav, Agrawal N, Energetic and Exergetic studies of modified CO2 transcritical Refrigeration Cycles, Int. J Low Carbon Technology vol 16 (1), 2021, 171-180.

#### https://doi.org/10.1093/ijlct/ctaa042

3. Jadhav, P., Agrawal, N. (2020). "Comparative study on a straight and helical capillary tube for CO2 and R22 refrigerant", Journal of Thermal Science and Engineering Applications (ASME) 13(2), 024502, April 2021.

#### https://doi.org/10.1115/1.4047822

- 4. Jadhav P, Agrawal N. A comparative study of flow characteristics of adiabatic spiral and Helical capillary tube in a CO2 transcritical system, International Journal of Ambient energy, https://doi.org/10.1080/01430750.2021.1913645, 28th April 2021
- 5. Jadhav P, Agrawal N. A Review of Flow Characteristics of the Straight and Coiled Capillary Tubes, Int. J of Air conditioning and Refrigeration, 29(3), 2130004, 2021,

#### https://doi.org/10.1142/S2010132521300044

- Kuldeep A. Mahajan, Raju Pawade, Effect of machining parameters and vibration on Polymethylmethacrylate (PMMA) curved surface in Single point diamond turning, Journal of Micromanufacturing, Sage Publications, 2020, Page 1-10, https://doi.org/10.1177/2516598420941728
- 7. Vinod Mishra, Rohit Sharma, Kuldeep Mahajan, Jayant Kumar, Neha Khatri, Aniket Gupta, Harry Garg, Vinod Karar, Raju Pawade and Ramagopal V. Sarepaka, Experimental investigations on ultraprecision machining of polycarbonate and related issues, Journal of Micromanufacturing, Sage Publications, 2020, Page 1-13,

#### https://doi.org /10.1177/2516598420938495

 Pawade Raju and Shinde Babasaheb, Study on Analysis of Kerf Width Variation in WEDM of Insulating Zirconia, MATERIALS AND MANUFACTURING PROCESSES, Taylor and Francis, 2020

#### https://doi.org/10.1080/10426914.2020.1854468

**9.** Dhanraj B. Waghmare, Partha Saha, Parametric optimization for autogenous butt laser welding of sub-millimeter thick SS 316 sheets using central composite design, Optics & Laser Technology Volume 122, February 2020,

#### https://doi.org/10.1016/j.optlastec.2019.105833

#### 9.3 National Journals and Conferences

1. S. Nipanikar, V. Sargade, Effect of Process Parameters during Turning of Ti6Al4V-ELI in Dry and MQL Environments, IJERD, Aug 2020,

# **10. DEPARTMENT ANNUAL BUDGET**

Sr.No.	Details	Amount
P. 1.1	Salaries and Wages Teaching	
P. 1.2	Salaries and Wages Non-Teaching	
P. 1.3	Ad-hoc Salary Teaching	
P. 1.4	Ad-hoc Salary Non-Teaching	
P. 1.5	Daily Wages Salary	
P. 1.6	Machinery & Equipment UG	9,83,046/-
P. 1.7	Machinery & Equipment PG	31,500/-
P. 1.10	Laboratory Expenditure(recurring)	3,50,425/-
P. 1.11	TA/DA	600/-
P. 1.12	Medical/LTC	
P. 1.14	Conferences & Seminars	5,634/-
P. 1.15	Office Expenses	15,551/-
P. 1.16	Departmental Students' Activities	NIL

# **11. LABORATORIES**

# **11.1 Major Instruments in Laboratories**

Sr. No.	Name of Instrument	Qty.	Total Cost
1	CNC TRAINER LATHE with Supporting Software, Training Manuals	01	4,79,476.69/
2	CNC MILL TRAINER MT- 200 with Supporting Software & Training Manuals	01	4,62,272.36/-
4	CAD / CAM Table, Size: H 30" X L 96" X W 24", 6 Drawer with Lock	10	92,936/-
5	Computer system	06	1,92,000/-
6	HP Compaq system	05	1,75,000/-
7	Liebet made Online UPS	01	77,480/-
8	HP Compaq Presario Computer System SR1530	05	1,92,500/-
9	HP Compaq Presario Computer System SR1530	05	1,92,500/-
10	Desktop HP DX 7200 Processor Computer System	15	6,52,500/-

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11	Desktop HP DX 7200 Processor Computer System	05	217500/-
12	Desktop HP DX 7200 Processor Computer System	10	4,18,270/-
13	Computer Application Software (Autodesk Inventor Professional 2008 Education Network Copy ) (Sr. No. 346-8911-0604, 0998, 1255,1592,1889,2186,2483,0703,1790,1493,1097,1394,1691,1988, 2285,2582,0802,1196,2087,2384 )	20	6,34,400/-
14	Computer Application Software (Autodesk Inventor Professional 2008 Education)	20	90,000/-
15	Online UPS System of KVA Capacity	01	2,27,595/-
16	Laptop DELL Vostro 1510 (Sr. No. 68GL2BS, D8GL2BS, 26HN2BS,68GL2BS, B8GL2BS, 78GL2BS, CIDN2BS, 58GL2BS, 88GL2BS, 98GL2BS, 48GL2BS )	11	4,34,500/-
17	HP/8300 Desktop computer with preloaded operating system Microsoft windows 8	20	7,56,000/-
18	HP/830 Desktop Computer with Preloaded operating System	15	
19	Carbon Dioxide Heat Pump test Rig	01	19,096.87/-
20	Fluid Mechanics Test Bench	02	2,95,510/-
21	SAJ make Eddy current dynamometer	01	1,12,760/-
22	Constant temperature oil bath with ms powder stand	01	68,000/-
23	Metzer - m Trinolar Research metallurgical microscope	01	1,24,110/-
24	Microhardness Tester Shimadzu make	01	1,602300 yen
25	Measuring microscope	01	404468 yen
26	Automatic Specimen mounting press Bain mount	01	1,18,390/-
27	Slip Gauge Accessories	1 set	1,58,207/-
28	Digital Venturis 466 as Nodes	04	3,62,660/-
29	2KVA CVT Elect.	01	95,250/-
30	Rank Tailor Hobson Surface Roughness Testing Instrument Surtronic 3+(Battery Operated Printer)	01	1,90,179/-
31	Gear Rolling Tester	01	96,286/-
32	Baker Dot Matrix 24 column print Module "PM" suitable for ED1/EC10	01	10,400/-

33	Monochromatic Light Source	01	52,312/-
34	Refrigeration Test Rig	01	75,240/-
35	Pyrometer		1,44,000/-
36	Pyrometer	01	1,84,653/-
37	Vibration Laboratory	01	86,130/-
38	Cam Analysis Apparatus	01	37,125/-
40	Journal Bearing Apparatus	01	66,037/-
41	Carioles Acceleration Apparatus	01	79,531/-
42	Lab View Software	01	1,41,614/-
43	CRIO-9025	01	3,15,188/-
44	CRIO-9118	01	2,94,228/-
45	NI 9234		2,43,661/-
46	NI 92194		72,181/-
47	12" Industrial Panel		72,181/-
48	PS-2 Power supply for field point		1,68,074/-
49	CDAR 9174 Compact	01	83,250/-
50	Stat graphics centurion professional xv -01 box with CD and Manual	02	62,450/-
51	Metallurgical sample saw	01	1,23,750/-
52	Wear and Frication monitor	01	3,93,750/-
53	Refrigeration test ring	01	84645/-
54	Fluid mechanics test bench 02	01	2,95,510/-
55	Signal cylinder Two stoke petrol engine test ring.	01	87,912/-
56	Fluid mechanics test bench 01	01	1,85,364/-
57	Heat transfer in Forced Convocation	01	59,061/-

58	Wire Electrical Discharge Machine- ECOCUT- Electronica	01	2509000/-
59	Constant temperature oil bath with ms powder stand	01	68000/-
60	Inverter 600 VA luminous make	01	10940/-
61	Electromagnetic Flow Meter	01	23388/-
62	Magnetic dial stand	01	6750/-
63	Monochromatic Light Source	01	45562/-
64	Erichsen cupping tester	01	41468/-
65	CNC Simulators for offline programming (HASS USA Make, Model: CSMD)	06	999000/-
66	High Speed Camera	01	2298339/-
67	Universal Testing Machine	01	895620/-

# 11.2 Laboratory Expenditure

Sr. No.	Name of the Laboratory	Total cost Laboratory
1	Refrigeration and Air Conditioning Lab	
2	Fluid Mechanics and Fluid Machinery Lab	
4	Renewable Energy Lab	
5	I.C. Engine	
6	Thermal Engineering Lab	4,998
7	Material Science / Engineering Metallurgy Lab	73,000
8	Material Testing Lab and Strength of Material (SOM)	87,143
9	Photochemical Machining Lab (PCM)	
10	Theory of Machines And Machine Dynamics Lab/ Engineering Mechanics Lab	

12	Metrology and Quality Control Lab			
13	CAD / CAM Lab			
14	Center for Advanced Machining Technology (CAMT)	5,000		

# SOME MAJOR INSTRUMENTS IN THE LABORATORIES





# **12. PROJECTS**

# **12.1 List of Undergraduate Projects**

Sr. No.	Name of the Project	Advising Faculty
1	Modeling and Determination of Machining Parameters for End Milling of AISI 4340 Alloy Steel	
2	Between Standard Fpy Creation And Controlling VFK Variation Assembly and ATB	
3	Scratches Occurrence & Decoration of Window Frame of Airbus A321 Neplug Door	Dr M Sadajah
4	Green Supply Chain Management With Vendor Quality Improvement	Di. Mi. Suduluit
5	Controlling VFK Variation Between Assembly and ATB	
6	Analysis of Boiler failure and its solution,	
7	Design of Air receiver for Steradix Pvt Ltd	Dr. M. S. Tandale
8	Internship project at BASF Dahej	Di. ni. 5. Tundulo
9	Design of solar power system for irrigation	
10	Design of solar based domestic water heating system	Dr. V. G. Sargade
11	Production, staorage and application of Hydrogen: a review.	
12	Acoustic emission signal characteristics in Micro-drilling of TiCFRP Stacked composite	
13	Design verification of NP01 track rollers used NL01 type trolley	Dr. P. S. Pawada
14	Acoustic emission monitoring	D1. R. 5. 1 awade
15	Study of installation of cooling coil in gearbox of Ammonia feedpump in RCF	
16	Design and development of a demonstration model of magnetic levitation system for material handlings	
17	Internship project at BASF Ltd Gujrat	Dr. R. P. Kate
18	CNG cylinder testing lab	
15	Design of compound press	Dr. H. N. Warbatkar
16	Design & modificati of SUV clutch mech	Di. II. IN. Walliatkal

17	Design of HVAC system for a commercial building	
18	Thermal & Mech Design of STHE Combined power cycle operation & maintenance of Rel Ind Jamnagar	Dr. NeerajAgrawal
19	Thermal cooling for laptop, Analysis of recipr compressor at BSFC Thane	
20	DESIGN OF CONVEYER BELT MAINTENANCE TOOL	
21	Design calculation of vessel sizing	
22	An Overview of Quality Control and Evaluation of Quality Improvement Methods from Manufacturing and Production	Dr. B. F. Jogi
23	DESIGN OF CONVEYER BELT MAINTENANCE TOOL	
24	Robotic arm for Library	Dr. U.S. Ioshi
25	Compressor valve failure	DI. H S JOSHI
26	Solar Power System Design for Irrigation	
27	Rectification of Problem in Raw Material Charging System from Bunker House To Furnance Bins of SAF 3	Dr. D. B. Waghmare
28	Design & Installation of Solar Based Domestic Water Supply System	
29	Portable Steam Cleaner	Prof. S. R. Dhale
30	INTERNSHIP REPORT IN BHARAT ELECTRONICS LTD., NAVI MUMBAI	
31	INTERNSHIP REPORT ON DESIGN MODELLING AND FABRICATION OF JET DEFLECTOR ASSEMBLY	
32	DESIGNING OF HELICAL TUBE IN SHELL HEAT EXCHANGER	Mr. P.D. Agwane
33	Coconut de-husking machine	
34	Opt of reliability & eff of power plant	
35	Failure analysis of mechanical seal	Dr. G S Warkhade
36	Std creation of PVC pipes by extrusion	
A CONTRACTOR OF A CONTRACTOR A CONTRACT		

# **12.2 List of TPCS Projects**

Sr. No.	Name of the Project	Advising Faculty
1	A Mechanical Alarm	
2	Smart Blind Stick	Dr. M. Sadaiah
3	Review of various tools used in agriculture by farmers	Dr. M. S. Tandale
3	Low – cost Floor Cleaning and Drying Machine	Dr. V. G. Sargade
4	Solar energy for food preserva	
5	Prediction of pred in tribal Gad	
6	Compost crusher for eff WM	Dr. R. P. Kate
7	Drinking water chlorination	
8	Design of water tank cleaning system	
9	Design & fabrication of stair climbing trolley	
10	Air cooling system by using conventional nozzles	Dr. R. S. Pawade
11	UV rays sanitization pen Human Powered Animal Lift	Dr. Neeraj Agrawal
12	Vacuum sealing: preservation techniques for vegetables	Dr. H. N. Warhatkar
13	Bio-waste management using Black soldier fly	Dr. H. S. Joshi
14	Multi-functional toolbox	
	Drainage cleaning mechanism	Dr. B. F. Jogi
15	Modification of Stair Walker	Dr. D B Waghmare
16	Manually powered stair climbing trolley	
17	Cylinder weight measuring trolley	Dr. G. S. warknade
16	Multipurpose wheelchair with emergency notification system	Prof. S. R. Dhale
18	MINI CONVEYOR USING GENEVA MECHANISM	Prof. Prashant Agawane

19	PORTABLE VENTILATOR				
20	Multi-nozzle agriculture sprayers	Prof. Pratik Dange			
21	Automatic alcohol hand sanitizer dispenser	- Prof. Nivedita Patil			
22	Algae based H2 power plant systems				
23	Automatic sewage cleaner	Prof. Neeraj Kulkarni			
24	Multi-purpose agriculture machine	Prof. Harsha Nathjogi			
25	Manually operated hydraulic mango harvestor				

# 12.3 List of Post Graduate Projects

Sr. No.	Name of the Project	<b>Advising Faculty</b>
1	Experimental Investigation in Mechanical Micro drilling of Ti6Al4V/CFRP Stack Material	Dr. R. S. Pawade
2	Analysis of welded joint using feast SMT software Dr. D. B. Wag	
3	An Experimental study of surface roughness variation in end milling of super duplex 2507 stainless steel	Dr. M. Sadaiah
4	Experimental investigation of spring back effect during single point incremental forming	Dr. H. S. Joshi
5	Designe of bio-gasification plant using municipal solid waste	Dr. M. S. Tandale

# 12.4 List of PhD candidates

Sr. No.	Name of the Candidate	Registration Number	Broad area of Research	Research Guide
1	Thorat Shrikant B.	RS20140115	Some investigations in photochemical machining of cobalt chromium alloy.	Dr. M. Sadaiah
2	Kadam Shirish V.	RS20140117	Some investigations on machinability of SAF2205 and SAF2507 duplex steel in end milling.	Dr. M. Sadaiah
3	Chavan Ajay A.	RS20120109	Hard turning using coated carbide tools.	Dr. V.G.Sargade
4	Nipanikar Suresh R.	RS20120112	Machinability Studies of Ti6Al4V in Dry and Minimum Quantity Lubrication (MQL) Environment.	Dr. V.G.Sargade
5	Shinde Babasaheb D.	RS20140113	Machinability assessment of low electrical conductivity ceramics by using WEDM.	Dr. R. S. Pawade

6	Khadtare Avinash N.	RS20140108	Experimental investigation and modelling in micro-drilling of TBC Inconel 718 superalloy.	Dr. R. S. Pawade
7	Jagtap Ketan A	RS20120104	Investigation on Machined Surface Integrity in CNC Turning of Biocompatible Co-Cr-Mo Alloy	Dr. R. S. Pawade
8	Madavi Kishor R.	RS20140110	Optimization of welding process parameters.	Dr. B.F. Jogi
9	Lohar Ganesh S.*	RS20140109	Structure property relationship studies on polymer nano- composite.	Dr. B.F. Jogi
10	Bhanavase Vishavjit L.	RS20140106	Study of tribologicalbehaviour of polymer composite.	Dr. B.F. Jogi
11	Nirantar Shripad R.	RS20150103	Preparation and Characterization of Polymer based nano composite.	Dr. B.F. Jogi
12	Varier Ranjith S.	RS20150104	Study of machining behaviour of polymer based composite.	Dr. B.F. Jogi
13	Bhise Vishal Y.	RS20150101	Sustainable manufacturing: An Eco-intelligent design of product system	Dr. B.F. Jogi
14	PatilOmprakash S*.	RS20120117	Transcritical CO <sub>2</sub> Heat Pump System: Cycle Modification and Optimization	Dr. N. Agrawal
15	Jadhav Pravin L.*	RS20120115	CO <sub>2</sub> Transcritical System: Studies on Capillary Tube	Dr. N. Agrawal
16	Vinod C Todkari*	RS20120118	Investigations on various types of Hydraulic Jump	Dr. R. P.Kate
17	Gujar R.A.	RS20140101	Some investigations in Biomechanical properties of Lower Extremity Bones	Dr. H. N. Warhatkar
18	Pansare S. R.	RS20140102	Some studies on Effect of Crack in Beam/Shaft	Dr. H. N. Warhatkar
19	Patil S.R.	RS20140104	Some studies on investigation into Torsional Vibration Control Using Smart Dynamic Damper	Dr. H. N. Warhatkar
20	Wargante S.R.	RS20140105	Some studies in Dynamic Analysis of Bones	Dr. H. N. Warhatkar
21	Kadhane Somnath Hanumant	RS20120106	Some investigation into mechanical behaviour of soft biological tissues	Dr. H. N. Warhatkar
22	Mahesh Pol	RS20160101	Topic yet to be decided	Dr. H. S. Joshi
23	Rohit V. Zende	RS20180102	Intelligent Monitoring of Cylindrical parts using Industry 4.0 Approach	Dr. R. S. Pawade
24	Pankaj M. Dhongade	RS20180103	Processing of Polymer-Matrix Composite Material	Dr. V.G.Sargade
25	Sagar Sakharkar	RS20180104	Mechanical Micro-drilling of Titanium CFRP stack material	Dr. R. S. Pawade

26	Prasad J Waste	RS20180105	Some Investigations in WireEDM	Dr. B. F. Jogi
27	Sagar Ajanalkar	RS20180106	Robot based ASRS System	Dr. H. S. Joshi
28	Ninad Girish Mahadeshwar	RS20190102		Dr. N. Agrawal
29	Deshmukh Shahaji Prakashrao	RS20190103		Dr. V.G.Sargade
30	Yogiraj Basavraj Dama	RS20190104		Dr. B. F. Jogi
31	Vartak Sanket Pravin	RS20190106		Dr. H. S. Joshi
33	Rajwade Mahesh Madhusudan	RS20190107		Dr. V.G.Sargade
34	Agwane Prashant Dattu	RS20190108	Evaluation of 3D printing strategies for strength and material optimization	Dr. H. S. Joshi

\* PhD awarded.

# **13. INDUSTRY INSTITUTE INTERACTION**

# **13.1 Industry Projects by Students**

Sr. No.	Name of the Project and Industry	Advising Faculty
1	<ol> <li>Design of HVAC System for a Commercial Building</li> <li>Thermal &amp; mechanical design of shell &amp; tube heat exchanger</li> </ol>	Dr. N. Agrawal

# **13.2 Industry Institute Interaction by Faculty**

Sr. No.	Name of the Faculty	Name of the Industry and Interaction
1.	Dr. M. Sadaiah	Internship Projects at Bharat Forge Ltd, Pune; Bosch, Nashik; Aerostructures Assemblies India, Belagavi
2.	Dr. M.S. Tandale	BASF, Sai Wardha Power and Steradix (consultant Pune)
3.	Dr. N. Agarwal	ISHRAE, BTP
4.	Dr. R. S. Pawade	SAE
5.	Dr. B. F. Jogi	Mahindra Composites, Pune; DuFlon Industries Ltd, Mahad; DRDO Mumbai
6.	Dr. D. B. Waghmare	Internship Project at Gram Orjaa Solutions Pvt. Ltd. and SAIL



# 14. WORKSHOPS ATTENDED BY FACULTY MEMBERS, RESEARCH SCHOLARS AND PG STUDENTS

#### 14.1 Workshops attended by Faculty Members

Sr. No.	Title	Date	Participants
1	Communication and ICT	05-10 May 2020	
2	Mental Health	06-10 May 2020	
3	Meditation and Breath	18-21 May 2020	Dr. M. Sadaiah
4	New Higher Education Policy and Digitization of Education	17 May 2020	
5	FDP	25-06-2020	Dr. M.S. Tandale
6	DTM Technology Development in India - Taking stock to way forward,	31 July -1 August 2020	Dr. R. S. Pawade
7	Advances in Additive Manufacturing	20 - 25 July2020	Dr. H. N. Warhatkar
8	Moodle Learning & Management Systems	25-30 April 2020	
9	Digitizing Engineering Graphics	20-24 July 2020	Dr. D. B. Waghmare
10	Interdisciplinary aspects in modelling of manufacturing processes	21-29 November 2020	

# 14.2 Expert Lecture by Faculty Members

Sr. No.	Name of the Event	Faculty delivering the Lecture
1	<b>'Alternate Cooling Solutions: Way of Sustainability',</b> 30 Jan 2021, ISHRAE Ahemdabad	Dr. N. Agrawal
2	<b>CO2 transcritical Heat Pump systems: Optimum pressure</b> <b>and design procedure</b> at WCE Sangali in FDP on Recent trends in heat exchangers on 14th July 2020	Dr. N. Agrawal
3	Machining Characteristics of Superalloys Inconel 718' in Technical Symposium webinar "Advances in Materials and Manufacturing Engineering (AMME 2020)" from 30 June 2020 to 4 July 2020	Dr. R. S. Pawade
4	Ultraprecision Manufacturing Processes- Single Point Diamond Turning, STTP Programme "Recent Advances in Smart Manufacturing Technologies" on the topics "Ultra precision manufacturing processes " at 12.00 pm on 18/06/2020 at Padm. Dr. V. B. Kolte College of Engineering, Malkapur Dist. Buldana (Ms)	Dr. R. S. Pawade

# **15. ACADEMIC ACHIEVEMENTS**

#### **15.1 Faculty Achievements**

Following list shows the statistics of citation index published by the faculty members of the department.

Sr. No.	Name of the Faculty	Total citations	h Index	i10 Index
1	Dr. N. Agrawal	109	15	18
2	Dr. R. S. Pawade	186	17	24
3	Dr. M. Sadaiah	110	12	18
4	Dr. M. S. Tandale	276	9	9
5	Dr. B. F. Jogi	276	8	7
6	Dr. R. P. Kate	25	5	4
7	Dr. H. N. Warhatkar	35	3	1
8	Dr. G. S. Warkhade	17	4	3
9	Dr. H. S. Joshi	11	2	1
10	Dr. S. R. Dhale	2	1	0
11	Dr. D B Waghmare	6	2	1
12	Dr. V.G. Sargade	70	12	12

# 15.2 Distinguished Alumni of the Department

Sr. No.	Name	Name of the Company/Institution	Designation
1	Chandrashekhar Singh	Infosys Ltd.	Lead Technology Specialist
2	VikramMasur	Siemens Indu Software Pvt. Ltd.	Manager
3	KantilalPuri	Thyssenkrupp Industries, India	Manager
4	SandeepGosavi	John Deere Technology Center, India	Manager

5	NileshKargutkar	Infosys Ltd.	Senior Engineering Manager
6	Amey Pore	Tata Technologies	Project Manager
7	IndranilMarathe	Precision Auto & Robotics Ltd.	Lead Member
8	Rajesh Ghadi	Air India	Senior Engineer
9	JitendraPathak	Dextra India	Director- Sales & Operations
10	JitendraDeshmukh	Voltas Ltd.	Procurement Head
11	NitinTiwari	Ebmpapst India Pvt. Ltd.	Regional Sales Manager
12	MilindChoudhary	Sterling & Wilson Pvt. Ltd.	Procurement Senior Manager
13	Sachin Pawar	ShapoorjiPallonji	Assistant General Manager
14	Raju More	Reliance Group of Industries	Manager
15	Dr.ShivkumarIyer	Rowan University, USA	Assistant Professor
16	SandipJadhav	CC Tech Pune	Chief Executive Officer
17	NageshBelure	Nyantara Enterprises, Pune	Entrepreneur
18	YogeshPatil	DuFlon Industries Pvt. Ltd.	Head, Research & Development
19	Dr.VikasSargade	Dr.BATU	Professor, Former Registrar, Dean

#### **15.3 STUDENTS ACHIEVEMENTS**

#### **15.3.1 ISHRAE Chapter**

- Mr. Shivam Kadukar secured the position of Runner in Tech Opinion
- Mr. Kartik Jaiswal and Ms. Harshada Hegishte secured the position of Winner in Tech Opinion
- Mr. Shreyas Thorkar secured the position of winner in Poster Making Competition
- Mr. Sanket Zade and Mr. Safwan Mujawar secured the position of winner up in CINE QUIZ
- Mr. Suyog Jawade and Mr. Rahul Wagh secured the position of runner up in CINE QUIZ

# 15.3.2 GATE Scores (GATE 2021)

Following students have a qualified GATE 2021 score from the department of mechanical engineeringduring academic year 2020-21.

Sr. No.	Name of Student	Registration No.	GATE 2020 Score
1	Bhavesh Sanjay Mali	ME21S72049142	377
2	Pratik Sunil Thakur	ME21S72052446	362
3	Kundeshwar	XE21S62087097	431

# **16. DEPARTMENTAL ACTIVITIES BY FACULTY AND STUDENTS**

#### 16.1 ISHRAE Chapter 2020-21

The local chapter of ISHRAE(Indian Society of Heating, Refrigerating & Air Conditioning Engineering) conducted various activities under their banner. Various events were conducted and local chapter of Dr.BATU brought numerous accolades with them. The working committee of year 2020-21 is given below.

Sr. No.	Name of Member	Year	Position
1	Akshay Ambekar	4 <sup>th</sup>	President
2	Prashant Bhalerao	4 <sup>th</sup>	Secretary
3	Mugdha Durge	3 <sup>rd</sup>	Treasurer
4	Shivam Kadukar	3 <sup>rd</sup>	Active Member
5	Priti Watghure	3 <sup>rd</sup>	Active Member
6	Samruddhi Mirgane	3 <sup>rd</sup>	Active Member
7	Gaurav Khirdikar	3 <sup>rd</sup>	Active Member
8	Saurabh Padole	3 <sup>rd</sup>	Active Member
9	Shweta Brahmankar	3 <sup>rd</sup>	Active Member
10	Kunal Phadatare	2 <sup>nd</sup>	Active Member
11	Akshay Rathod	2 <sup>nd</sup>	Active Member

In total of 82 members, 48 were from UG 4<sup>th</sup> year, 19 were from UG 3<sup>rd</sup> year, 15 from UG 2<sup>nd</sup> year course.

Some of the activities conducted by ISHRAE Dr.BATU local chapter during the academic year 2020-21 were as follows:

- 1. Poster Making Competition
- 2. Cine Quiz Competition
- 3. Tech Opinion

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# **17. FIVE-YEAR DEVELOPMENT PLAN (2016-2021)**

#### **Expansion of Academic Activities:**

- Academic programs to be added:
  - ✓ M.Tech. in Design Engineering
  - ✓ M.Tech. in CAD/CAM in collaboration with Indo-German Tool Room
- To help in fetching QIP Centre to the university and become part of it.
- Each faculty member will have average three research scholars

#### **Research & Development & Innovation:**

- Number of research scholars to be enhanced to 3 research scholars per faculty at any point of time.
- Each faculty member with PhD qualification will have at least one sponsored project funded by external agency such as UGC/DST/AICTE/BRNS at any point of time.
- Each faculty member with PhD qualification will have at least one consultancy project from Industry per year.
- At least five commercial products/processes/ technologies to be developed by 2021.

#### **Extension & Outreach Activities**

- At least two CEPs/Workshops for industries/academia will be organized every year.
- At least one National/International conference to be organized every alternate year.
- At least 5 skill development program will be organized for the unemployed youth in the vicinity

#### Faculty & Staff Development

- Faculty will undergo on an average one week of training per year in the industry.
- Supporting staff will also undergo on an average one week of training as per training needs.

#### Networking

• At any point of time, at least five network projects in collaboration with organizations like ICT, IIT, RRCAT, BARC and NCL will be going on.

#### **Co-curricular/Professional Chapter Activities**

- SAE BAHA/ISHRAE chapters will be conducting activities with full swing. In addition, an ASM Students' Chapter is to be established.
- Robo-Study Circle will be established for the students.

# 18. DEPARTMENTAL STRENGTHS, WEAKNESSES, OPPORTUNITIES AND CHALLENGES

#### **Major Strengths of the Department:**

- Highly qualified, committed and stable faculty.
- Strong linkages with IIT-B, BARC and ICT Mumbai.
- Liberal faculty development policy and attitude.
- Residential campus.
- UGC grants under 12(B).
- Good research culture & work culture.
- Autonomy & academic freedom.

#### Weaknesses of the Department:

- No grant for M. Tech. Program.
- Location disadvantages:
  - a. Non-availability of mechanical engineering industry in the vicinity
  - b. Placement
  - c. Attracting visiting faculty
- Infrastructure: Lab space on the ground floor

#### **Opportunities:**

- Demand for researchers and innovators due to knowledge-driven economies:
  - a. Enhancing M. Tech. programs particularly in inter-disciplinary areas, starting dual degree programs
  - b. Enhancing Ph.D. programs
  - c. To become a QIP Centre for M. Tech. & Ph.D. programs
- Enhancing sponsored research, consultancy, CEPs for academia and industry
- Technical services to rural community by developing appropriate technologies
- Public-private partnerships

#### **Challenges:**

- Retention of faculty
- Attracting talented students
- Competition from foreign universities and private universities
- Competition from countries like China, Philippines, etc.