DEAPRTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING

2012-2013

State-of-the-Art Laboratories:

1. Nuclear Thermo-hydraulics and Safety Research Laboratory

The Nuclear Thermo-hydraulics and Safety Research Laboratory has been developed in the Department with the financial assistance from BARC, Mumbai in the form of three projects having a cumulative outlay of approximately 400 Lac. In this Laboratory the Severe accident scenario in the Indian Pressure Heavy Water Reactors (PHWRs) and Advanced Heavy Water Reactors (AHWRs) shall be experimentally simulated in a single full length channel and the Reactor design safety shall be investigated. The generated experimental data will be helpful to validate the channel heat transfer models. The laboratory has state-of-the-art heating facility of 490 kW capacity (70/140VDC and 3500/7000A).

2. Fire Safety and Research Laboratory

The Fire Safety and Research Laboratory has been developed in collaboration with BARC, Mumbai through the sponsored project of 400 Lac outlay. The laboratory consists of fire test facility for defining the design fire environment relevant for Nuclear Power Plants and other establishments. The main features of the facility are the preparation of actual fire temperature–time, fire flux- time curves for actual combustibles (cable, liquid combustibles etc.), to study effect of ventilation on the design fire curves. Further, the acceptance criteria of various equipment, cable and instrumentations against possible design fire is adopted. The facility consists of a cone calorimeter of real time analysis. The FTT make Cone Calorimeter has been procured to meet all existing Standards and find the heat release, mass loss, smoke production during the room fire.

Summary of Major Sponsored Research and Consultancy Projects

Name of Faculty	Name of the project	Funding agency	Amount (Rs in Lakhs)
Dvivedi, Akshay	Development and Parametric Evaluation of Micro-Ultrasonic Machining for 3-D micro-moulds	Fast Track Young Scientist (SERC) Recommended for funding	27.00 Recommended for funding
Dvivedi, Akshay (PI) **Kumar, Pradeep** **Sharma, A.K.**	Development and Parametric Study of Grinding Assisted Electro Chemical Discharge Machining	DST (SERC)	35.00
Jain, P.K.	Experimental investigation and performance optimisation of high precision finishing of gears by electro chemical honing (ECH) process	CSIR	13.40
	Establishing pre-heat time and development of nozzles for reducing pre-heat time while using Bharat Metal Cutting Gas (BMCG)	BPCL	14.045
	Experimental Investigation on Machining of Ti-6Al-4V Alloy	CSIR	20.66
	Ultrasonic Vibrations Assisted Electro Chemical Machining with Abrasive Honing Gear	DST	26.50
Kumar, Ravi	Assessment of radiation heat transfer for 19 pin PHWR fuel bundle under heat-up condition	BRNS	54.96
Murugesan, K.	Solar Assisted Ground Source Heat pump System for Domestic and Industrial Applications	CSIR	18.8
Sahoo, P.K. (PI) **Mishra, Manish**	CFD Simulation of a deformed reactor channel under heat-up conditions	BRNS, DAE	14.95
Sharma, Satish C. **Harsha, Suraj P.**	Computation and validation of lube oil and Jacking oil flows/losses as well as Stiffness and damping coefficients in Hydrodynamic Journal Bearings of Steam Turbine.	BHEL Haridwar	12.5

PhD Awarded:

Name of Student	Title of Thesis
Hrusikesh Mohanty	Some Modeling Approaches on The Effects of Tool Geometries on Friction Stir Welds
Chaitanya Sharma	Mechanical and Corrosion Behavior of Friction Stir Welded Joints of 7039 Aluminium Alloy
Nathi Ram	A Study of Non-Recessed Journal Bearings With Micropolar and Couple Stress Lubricants
Somnath Bhattacharya	Numerical Simulation of Fatigue Failure in Functionally Graded Materials Using Xfem
Pawan Kumar Rakesh	Secondary Processing of Polymer Matrix Composites
Vivek Jain	Some Studies on Development of Microchannels using Micro-Ultrasonic Machining
Dheeraj Gupta	Development and Characterisation of Metal Based Deposits Through Microwave Heating
Pandya Unnati Rameshchandra	Analysis of Carbon Nanotube Reinforced Composites
Prabhkiran Kaur	Studies on Electromagnetically Stir Cast Al-Si Alloys
Adisu Bekele Alemayehu	Thermo-Hydraulic Characteristics of Solar Air Heater With Surface Mounted Obstacles

Research Publications:

Journals

1. **Abdul Rahim A., Sharma Umesh Kumar, Murugesan K., Sharma Akanshu D. and Arora Puneet**. Multi-response optimization of post fire residual compressive strength of high performance concrete, Building and Construction materials, 38, (2013), 265–273.
2. **Ali Md Shaukat, Karamveer, Tariq Andallib and Gandhi B. K.** Measurement of Heat Transfer Coefficient in a Rectangular Duct with Array of rib by using Transient Liquid Crystal Thermography, International Journal of Emerging Trends in Engineering and Development, 5(2), (2012).
3. **Ali Md Shaukat, Tariq Andallib and Gandhi B. K.** Flow and Heat Transfer Investigation behind Trapezoidal Rib Using PIV and LCT Measurements, Experiments in Fluid, 54, (2013), 1520, DOI: 10.1007/s00348-013-1520-8.
4. **Arya R.K., Dvivedi A. and Karunakar D.B.** Parametric Investigation of Powder Mixed Electrical Discharge Machining of Al-Sic Metal Matrix Composites, International Journal of Engineering Innovations and Research, 1(6), (2012), 559-566. ISSN: 2277 – 5668.
5. **Bansal Amit, Sharma A.K., Kumar Pradeep and Das Shantanu**. Joining of mild steel paltes using microwave energy, Advanced Materials Research, 585, (2012), 465-469 (ISBN-13:978-3-03785-526-3).
6. **Bansal Amit, Sharma Apurbba Kumar, Kumar Pradeep and Das Shantanu.** Joining of mild steel plates using microwave energy, Advanced Materials Research, 585, (2012), 465-469. ISBN-13:978-3-03785-526-3.
7. **Bansal Amit, Sharma Apurbba Kumar, Kumar Pradeep and Das Shantanu.** Application of electromagnetic energy for joining of Inconel 718 plates, i'managers Journal of Mechanical Engineering, 2 (4), (2012), 18-23.

8. **Bekele Adisu, Mishra Manish and Dutta S.** Heat transfer augmentation in solar air heater using delta shaped obstacles mounted on the absorber plate, International Journal of Sustainable Energy, 32 (1), (2013), 53-69. DOI:10.1080/14786451.2011.598637.
9. **Belete Sirahbizu Yigezu, Jha P.K. and Mahapatra M.M.** Effect of Sliding Distance, Applied Load, and Weight Percentage of Reinforcement on the Abrasive Wear Properties of In Situ Synthesized Al–12%Si/TiC Composites, Tribology Transactions, 56, (2013), 546-554.
10. **Belete Sirahbizu Yigezu, Jha P.K. and Mahapatra M.M.** On modeling the abrasive wear characteristics of in situ Al–12%Si/TiC composites, Materials and Design, 50, (2013), 277–284.
11. **Bende Vikrant, Pathak Pushparaj M, Dixit Kedar S. and Harsha S.P.** Energy optimal trajectory planning of an underwater robot using a genetic algorithm, Proceedings of the Institution of Mechanical Engineers. Part I: Journal of Systems and Control Engineering, 226 (8), (2012), 1077-1087.
12. **Bhandari Deepak, Chhibber Rahul and Arora Navneet.** Effect of electrode coatings on diffusible hydrogen content, hardness and microstructures of the ferritic heat affected zones in bimetallic welds, Advanced Materials Research Journal: Manufacturing Science and Technology, 383-390, (2012), 4697-4701. DOI:10/4028/www.scientific.net/AMR.383-390.4697.
13. **Cheema M.S., Dvivedi A., Sharma A.K. and Biswas S.** Multicriteria Optimization of Rotary Tool Electric Discharge Machining on Metal Matrix Composite, Materials Processing Fundamentals, (2013), 159-168. doi: 10.1002/9781118662199.ch18.
14. **Cheema M.S., Venkatesh G., Dvivedi A. and Sharma A.K.** Developments in abrasive flow machining: a review on experimental investigations using abrasive flow machining variants and media, Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture, 226 (12), (2012), 1951-1952.
15. **Cheema Manjot S., Venkatesh Gudipadu, Dvivedi Akshay and Sharma Apurbba Kumar**. Developments in abrasive flow machining: a review on experimental investigations using abrasive flow machining variants and media, Proc. IMechE Part B: J Engineering Manufacture, 226(12), (2012), 1951-1962. DOI:10.1177/0954405412462000.
16. **Chhibber Rahul, Singh Hardeep, Arora Navneet and Dutta B.K.** Micromechanical modeling of reactor pressure vessel steels, Materials and Design, Sustainable Materials, Design and Applications, 36, (2012), 258-274.
17. **Das Shantanu, Bansal Amit and Sharma Apurbba Kumar.** Theory of Welding of Metallic Parts in Microwave Cavity Applicator, Fundamental J. Modern Physics, 3, (2), (2012), 125-155. doi:10.4028/www.scientific.net/AMM.110-116.1561.
18. **Dvivedi A, Rajeev V.R., Kumar P. and Singh I.** Tribological characteristics of Al 6063–SiCp metal–matrix composite under reciprocating and wet conditions, Journal of Engineering Tribology, Proceedings of the Institution of Mechanical Engineers, Part J [PIJ], 226 (2), (2012), 138-149.
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20. **Ganesh K. and Pathak Pushparaj Mani**, Modelling and Simulation of Four Legged Jumping Robot with Compliant Legs in Sagital Plane, Robotics and Autonomous Systems, 61, (2013), 221-228.
21. **George Titto John, Sharma Apurbba Kumar and Kumar Pradeep.** A Feasibility Study on Drilling of Metals Through Microwave Heating, i-manager's Journal on Mechanical Engineering, 2 (2), (2012).
22. **Gharge M., Rakesh P.K., Singh I. and Sharma Apurbba Kumar**. Crushing behaviour of metal matrix composite honeycomb under impact loading, International Journal of Engineering Simulation, 14(1), (2013), 23–30. ISSN: 1468-1137.
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25. **Jawalkar C.S., Kumar Pradeep and Sharma Apurbba Kumar**. Parametric study while microchanelling on optical glass using microcontroller driven ECDM process, Advanced Materials Research, 585, (2012), 417-421. ISBN-13:978-3-03785-526-3.
26. **Jawalkar C.S., Sharma A.K. and Kumar Pradeep.** Micromachining with ECDM: Research potentials & experimental investigations, International Journal of Mechanical and Aerospace Engineering, 6, (2012), 7-12.
27. **Jawalkar C.S., Sharma A.K. and Kumar Pradeep.** Parametric study while micro channeling on optical glass using microcontroller driven ECDM process, Advances in Materials and Processing, 585, (2012), 417-424.
28. **Jha Pradeep Kumar, Kumar Pradeep and Kant Suman.** Ann Model Prediction of Intermixing in Continuous Casting Tundish, 14 (1), (2012), 57-64.
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37. **Kumar L. and Jain P.K.** An Integrated Model of Dynamic Cellular Manufacturing and Supply Chain System Design, International Journal of Advanced Manufacturing Technology, 62, (2012), 385-404.
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43. **Mohanty H.K., Mahapatra M.M., Kumar Pradeep, Biswas P. and Mandal N.R.** A study on the effect of tool profiles on temperature distribution and material flow characteristics in friction stir welding, Proceedings of the Institution of Mechanical Engineers Part B, Journal of Engineering Manufacture, 226(9), (2012), 1527–153.
44. **Mohanty H.K., Venkateswarlu D., Mahapatra M.M., Kumar Pradeep, and Mandal N. R.** Modeling the effects of tool probe geometries and process parameters on friction stirred aluminium welds, Journal of Mechanical Engineering and Automation, 2(4), (2012),74-79.
45. **Narang H.K., Singh U.P., Mahapatra M.M. and Jha P.K.** Prediction and Optimization of TIG Weldment Macrostructure Zones Using Response Surface Methodology, J. Manuf. Sci Prod., 12, (2012), 171–180.
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Conferences / Symposia / Seminar / Workshop

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2. **Gupta A., Jain P.K. and Kumar, D**. Availability Modelling of Reconfigurable Manufacturing System, DAAAM International Scientific Book 2012, Chapter 21, (2012), 241-254.
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2013-14

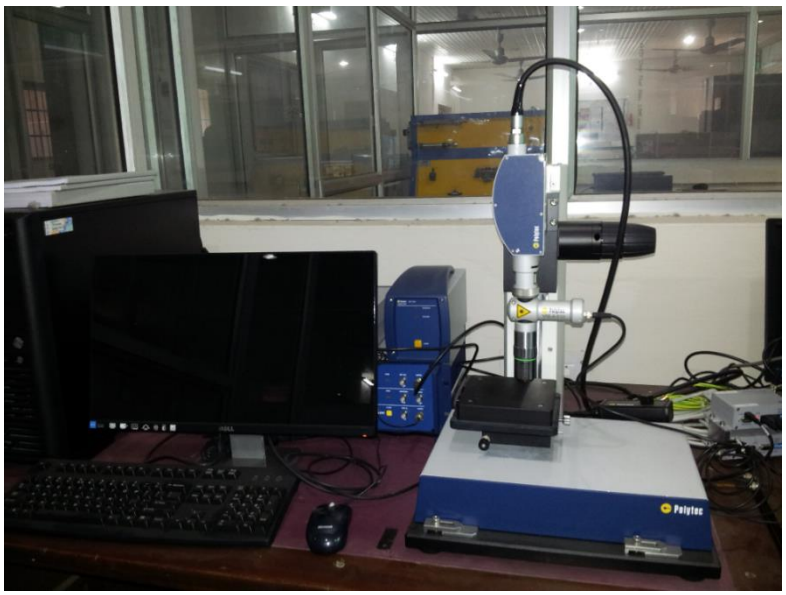
Research Facilities:

Dynamic Mechanical Analyzer

Dynamic Mechanical Analyzer measures the mechanical properties of materials as a function of time, temperature, and frequency. The Q800 DMA instrument incorporates unique technology to provide the ultimate in performance, versatility, and ease-of-use. State-of-the-art non-contact, linear drive motor technology in DMA instruments provides precise stress control. It is most useful for studying the viscoelastic behavior of polymers. Ultra-sensitive optical encoder technology is used to measure strain. The Q800 DMA instrument operates over a wide temperature range (-150 to 600°C) and provides multiple modes of deformation including dual/single cantilever and 3-point bending, tension, compression, and shear.

Polytec Micro-system Analyzer

This Single Laser-Doppler Vibrometer performs non-contact out-of-plane vibration measurement of a surface based on the principle of Doppler shift. The steady state as well as transient motion can be analyzed using this equipment. The higher frequency that can be measured is 2 MHz while the minimum resolution of vibration amplitude is about 15 pm. A minimum spatial resolution of 1.5um can be achieved. The equipment can be used for dynamic characterization of both micron and macro scale components and for investigating the propagating waves through solids.



Static and Dynamic Balancing Simulator

Solid Desiccant based Air-Conditioning System

MAJOR SPONSORED RESEARCH PROJECTS

Principal Investigators	Title of the Projects	Sponsoring Agency	Outlay Amt. (Rs. in Lacs)
Dwivedi, D K	Development of nitrogen ion implantation of PVD coating on stainless steel substrates for improved mechanical and tribological performance	DST	**6.40**
	Development of diffusion bonding technology for producing fatigue and fracture resistant bonds of stainless steels and titanium alloys with different inter-layers	Ministry of steel	**81.15**
Mishra, Manish	Investigation of the effect of temperature and flow non-unifomity on the performance of three-fluid heat exchanger	DST	**22.42**
Mulik, R.S.	Investigations into improvement of material removal rate in traveling wire electro-chemical spark machining (TW-ECSM) using magnetic field	DST	**29.50**
Tariq, Andallib	Detailed Heat Transfer Investigation Inside Rectangular Duct With matrix Cooling Using Liquid Crystal Thermography	GTRE, Ministry of Defence	**76.00**
Consultancy			
Arora, N.	Proof Testing for Pressure Vessel Using Strain Gauging	ISGEC, Yamunanagar	**2.10**
Gandhi, B. K.	CFD analysis of Intake arrangement of veer NLBC Hydroelectric Project	Mahati Hydro Power Projects Pvt. Ltd., Pune	**11.236**
Jain, P.K.	Quality Assessment of Steel Pipes	Jal Sansthan, Uttarakhand	**5.18**

Ph.D. Awarded

Name of Students	Title of the Thesis
Abhishek Singh	Investigation on Electro Discharge Drilling and Hole Grinding of Metal Matrix Composites
Belete Sirahbizy Yigezu	Some studies on Wear, Machinability and Weldability of Al-12%Si-TiC In-Situ Composite

Harendra Kumar Narang	Experimental and Finite Element Modeling of Arc Weldment Profiles and Angular Distortions
Joao A Duro	Machine Learning Based Decision Support for a Class of Many-objective Optimization Problems
Kishor Kulkarni	Investigation of Heat Transfer in Concentric and Eccentric Horizontal Cylindrical Annuli
Md. Shaukat Ali	Heat Transfer & Fluid Flow Investigation in a Rectangular Duct
Pandya Divyand H.	Dynamic analysis of high speed rolling element bearings due to various defects
Pramendra Kumar Bajpai	Processing and Characterization of Polymer Matrix Green Composites
Sachin Chandrabhan Gajbhiye	Dynamic analysis of inflatable membrane structure for space application
Sarbjit Singh	Primary and Secondary Processing of Metal Matrix Composites
Vikas Dhawan	Development of Intelligent Knowledge Base for Machining of Composites

Research Publications:

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61. **Upadhyay V., Jain P.K. and Mehta N.K.** A Step towards Green Manufacturing, International Journal of Machining and Machinability of Materials, 13(4), (2013), 349-371.
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Conference/Symposium

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3. **Gor M. M., Pathak P. M., Samantaray A. K., Yang J.M. and Kwak S.W.** Dynamic Modeling and Simulation of Compliant Legged Quadruped Robot, 1st International & 16th National Conference on Machines and Mechanisms (iNaCoMM 2013), IIT Roorkee, Dec. 18-20, (2013), 7-16.
4. **Hasan F., Jain P.K. and Kumar Dinesh.** Machine Reconfigurability Models Using Multi Attribute Utility Theory and Power Function Approximation, International Conference on Design and Manufacturing, IConDM-2013. IIITDM, Kancheepuram, India.
5. **Jain Dharmendra and Sharma Satish C.** Study of Two Lobe Multi- Recessed Hybrid Journal Bearing Operating with Power Law Lubricant, ASIATRIB-2014, Feb. 17-20 (2014).
6. **Jani D.B., Mishra Manish and Sahoo P.K.** Simulation of Desiccant Cooling Systems Using TRNSYS, 23th National and 12th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, India, Dec. 28-30, (2013).
7. **Joshi Preeti and Upadhyay S. H.** Fourth International Conference on Perspectives in Vibration Spectroscopy (ICOPVS 2013), Kerala, India, Aug. 6-9, (2013).
8. **Kulkarni Kishor, Sahoo P.K. and Mishra Manish.** Investigation of Heat Transfer Between Pressure Tube and Calandria Tube of IPHWR, 23th National and 12th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, India, Dec. 28-30, (2013).
9. **Kumar A., Jha P. K. and Mahapatra M. M.** Synthesis and Mechanical Property Evaluation of Al-Cu-TiC in-situ Metal Matrix Composites, 22nd International Conference on Processing and Fabrication of Advanced Materials(PFAM-XXII), Singapore, Dec. 18-20, (2013).
10. **Kumar A., Jain P.K. and Pathak P. M.** Comparative Finite Element Analysis of Reconstructed New and Worn Tooth of Spur Gear, 1st International and 16th National Conference on Machines and Mechanisms (iNaCoMM-2013), IIT Roorkee, Dec.18-20, (2013), 163-168.
11. **Kumar Rajneesh, Siddiqui Md. Irfanul Haque. and Jha Pradeep Kumar.** Numerical Investigations on the use of Flow Modifiers in Multi-Strand Continuous Casting Tundish using RTD Curves Analysis, International Conference on Smart Technologies for Mechanical Engineering, Delhi Technological University, Delhi, India, (2013), 603-612.
12. **Kumar Vijay and Pathak Pushpraj M.** A Stable Docking Operation by a Group of Space Robots, 1st International & 16th National Conference on Machines and Mechanisms (iNaCoMM 2013), IIT Roorkee, Dec. 18-20, (2013), 132-139.
13. **Kushare Prashant B. and Sharma Satish C.** Influence of Wear on the Performance Analysis of Non-Circular Non-Recessed Hybrid Journal Bearing Configurations, ICAT-2014, Feb. 21-24, (2014).

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23. **Rajput Arvind K. and Sharma Satish C.** Influence of geometrically imperfect misaligned journal on the performance of CFV compensated 4 pocket hybrid journal bearing, ICAT-2014, Feb. 21-24, (2014).
24. **Rajput Arvind K. and Sharma Satish C.** Stability of a Constant Flow Valve Compensated Multirecess Conical Hybrid Journal Bearing Operating with Micropolar Lubricant, ITS 2013, Lulea university of Technology, Lulea, Sweden, Mar. 19-21, (2013).
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27. **Rohit Agarwal, P.K.Sahoo, Manish Mishra, Study of Underformed Fuel Channel of IPHWR in LOCA With Low Steam Flow**, New Horizons in Nuclear Reactor Thermal Hydraulics and Safety (NRTHS), Mumbai, India, Jan. 13-15, (2014)**.**

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29. **Salhotra Rahula and Mishra Manish.** Finite-Time-Thermodynamic Optimization of Irreversible Stirling and Ericsson Heat Engines, 23th National and 12th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, India, Dec. 28-30, (2013).
30. **Shandilya P., Jain P. K. and Jain N. K.** RSM and ANN modeling approaches for predicting average cutting speed during WEDM of SiCp/6061 Al MMC, International Conference on Design and Manufacturing, IConDM-2013. IIITDM, Kancheepuram, India.
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42. **Yadav Saurabh K. and Sharma Satish C.** Combined influence of tilt on the performance of hybrid thrust bearing system operating with non-Newtonian Lubricant, ASIATRIB-2014, Feb. 17-20 (2014).
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45. **Zafar Sunny, Sharma Apurbba Kumar and Arora Navneet.** Microwaves in surface engineering', International Conference on Smart Materials Processing in Mechanical Engineering STME-2013, Delhi Technological University (DTU), New Delhi, Oct. (2013), 698-704.

Book

1. **Dwivedi D. K.** Production and properties of cast Al-Si alloys, New Age Publication, New Delhi, (2013), ISBN 978-81-224-3451-4.

Book Chapters

1. **Kumar A., Jain P. K. and Pathak P. M.** An Overview of Reverse Engineering in Product Manufacturing, DAAAM International Scientific Book 2013, Chapter 39, 665-678, (2013).
2. **Mulik R.S. and Pandey P. M.** Magnetic abrasive finishing, Nonconventional finishing technologies, Polish Scientific Publishers PWN, Poland, 125-140, (2013).
3. **Sahani A.K., Jain P.K. and Sharma S. C.** Geometrical Tolerance Stack up Techniques, DAAAM International Scientific Book 2013, Chapter 52, 857-872, (2013).
4. **Sharma Satish C.** Tribology in Machine Components, Book Chapter from Tribology for Scientists and Engineers: From Basics to Advanced Concepts, Springer New York, 821-879, (2013)**.**
5. **Singh Inderdeep, Singh S. and Singh A**. Conventional and Unconventional Hole Making in Metal Matrix Composites, Machining and Machine-Tools, Woodhead Publishing, 171-195, (2013).
6. **Singh Inderdeep and Bajpai P.K.** Machining Behaviour of Green Composites: A Comparison with Conventional Composites, Green Composites from Natural Resources, Taylor & Francis Group, LLC-U.S.A, (2013).
7. **Singh Inderdeep, Bajpai P.K. and Dhawan V.** Primary and Secondary Processing of Bio-Composites, Biomass based Bio-composites, Smithers-Rapra, (2013).

8. **Singh Inderdeep, Debnath K. and Dvivedi A.** Joining of Natural Fibre-Reinforced Thermoplastic Composites, Biomass based Bio-composites, Smithers-Rapra, (2013)

2014-15

Major research facilities:

Equipment Developed: Heavy duty slurry pot tester

Small scale bench test rig for evaluating erosion wear.

Pot diameter = 800 mm, Pot height = 533 mm

Unique features:

Separate arrangements for suspending the solid particles in the pot and rotating the wear specimens at different speeds.

Test speed range = 0 - 32 m/s

Solid concentration = 0-30% by weight

Solid particle size = 0 – 2 mm

Impingement angle (fix) = 0-90 degree

Applications

- To determine the accelerated wear characteristics of the different type of materials at different impact angles.
- Can be used to evaluate erosion due to any suspension.
- Very suitable for erosion characterization of materials used for hydro turbine blades and slurry transportation pumps.
- Currently used for evaluating the erosion wear of hydro-turbine blade materials developed by a well known turbine industry - Voith, Germany.
- The maximum erosion is generally observed on the hydro turbines installed in the Northern region, Himalaya. This equipment will be very useful to develop new wear resistant materials for turbine used for hydropower generation in this area.

Microwave Materials Processing Laboratory

i) **A Major Facility:** 1.45 kW, 2.45 GHz Microwave Applicator

ii) **Characterization Facilities:** (a) Vicker's Microhardness Tester and (b) Image Analysis System.

MAJOR SPONSORED RESEARCH PROJECTS

Principal Investigators	Title of the Projects	Sponsoring Agency	Outlay Amt. (Rs. in Lacs)
Dwivedi, D.K.	Corrosion behavior of friction stir weld joints of AL alloys.	CSIR, New Delhi	17.92
	Investigation on plastic behavior of Aluminium alloys during friction stir welding and its effect on weldability	DST, New Delhi	6.45
Jogleker, Manish M.	Mathematical modeling and experimental characterization of the dynamic response of dielectric elastomer actuators.	SERB, New Delhi	20.99
Karunakar, D.B.	Investigation and Enhancing the Porosity of Ceramics Shell in Investment Casting Process	SERB, New Delhi	24.00
Mulik, R.S.	Investigation into improvement of material removal rate in traveling via electro-chemical spark machining (TV-ECSM) using magnetic field.	SERB, New Delhi	29.50

Parashar, Avinash	Tailoring of Polymer Properties using Nanofiller	MHRD (FIG)	10.00
Singh, Indra Vir	Simulation of high temperature elasto – plastic fatigue crack growth using XFEM	DRDO,VIshakha Patnam	19.78
	Prediction of graphite failure strength using RVE approach and XFEM.	BRNS,BARC, Mumbai	24.57
	Failure analysis of engineering components of Intricate Shape using extended Isogeometric analysis.	SERB, New Delhi	19.50
Subudhi, Sudhakar	Indo-Us Base (Bhaskar Advanced Solar Energy) Fellowship Program.	Indo-US-Sci-& Tech, DST, New Delhi	6.86
Upadhyay, S.H.	Rasidual Life Prediction and Vibration Analysis of a high speed Rotor Bearing System	DRDO, New Delhi	11.00
	Design & Development of a Proof-of-concept Model of an Adaptive Membrane	Indian Space Research Organizations (ISRO)	29.75
		Total	**145.05**

PhD Awarded:

Name of Scholar	TOPIC
Mr. Abhishek Singh	INVESTIGATION ON ELECTRO DISCHARGE DRILLING AND HOLE GRINDING OF METAL MATRIX COMPOSITES.
Mr. Pandya Divyang Harivadan	DYNAMIC ANALYSIS OF HIGH SPEED ROLLING ELEMENT BEARINGS DUE TO VARIOUS DEFECTS.
Mr.C. S. Jawalkar	INVESTIGATIONS ON PERFORMACE ENHANCEMENT OF ECDM PROCESS WHILE MACHINING GLASS.
Mr. Sachin C. Gajbhiye	DYNAMIC ANALYSIS OF INFLATABLE MEMBRANE STRUCTURE FOR SPACE APPLICATION.
Mr. Belete Sirahbizu Yigezu (Ethopian)	SOME STUDIES ON WEAR, MACHNIABILITY AND WELDABILITY OF Al -12% Si- TiC IN- SITU COMPOSITES.
Mr. Pramendra Kumar Bajpai	PROCESSING AND CHARACTERIZATION OF POLYMER MATRIX GREEN COMPOSITES
Mr. Anand Kumar	SOME INVESTIGATIONS ON WEAR, MACHINABILITY AND WELDABILITY OF IN – SITU AL - 4.5% CU/TIC MMC.
Mr. Arvind Kumar Rajput	STUDY OF GEOMETRICALLY IMPERFECT MULTIRECESS FLUID FILM HYBRID JOURNAL BEARINGS.
Mr. Ashwini Kumar Yadav	ASYMMETRIC BALLOONING OF PRESSURE TUBE UNDER LOCA IN INDIAN PHWR.

Mr. Trivedi Chiragkumar Hasmukhla	EX PERIMENTAL AND NUMERICAL INVESTIGATIONS ON STEADY STATE AND TRANSIENT CHARACTERISTICS OF A HIGH MODEL FRANCIS TURBINE
Mr. Joy Prakash Misra	EX PERIMENTAL INVESTIGATIONS OF ELECTROCHEMICAL HONING OF BEVEL GEARS
Mr. Prashanth A. S	EFFECT OF LOW FREQUENCY VIBRATIONS ON HUMAN COMFORT.
(Mrs.) Saroj Rani Pattnaik	REDUCTION OF SHRINKAGE AND POROSITY DEFECTS IN INVESTMENT CASTING.
Mr. A. Arul Peter	STUDY OF HEAT AND MOISTURE TRANSPORT THROUGH CONCRETE EXPOSED TO ELEVATED TEMPERATURES.
Mr.Faisal Hasan	SOME PERFORMANCE ISSUES FOR A RECONFIGURABLE MANUFACTURING SYSTEM.
Mr. Panchal Mitesh Bhai BipinBhai,	VIBRATION ANALYSIS OF SINGLE WALLED BORON NITRIDE NANOTUBE BASED MASS SENSOR.
Mr. Mohammad Asif	EXPERIMENTAL AND NUMERICAL INVESTIGATION OF THERMAL CONTACT CONDUCTANCE.
(Mrs.) Saroj Rani Pattnaik	REDUCTION OF SHRINKAGE AND POROSITY DEFECTS IN INVESTMENT CASTING.
Mr. Gor Mehulkumar Mahendrabhai,	DYNAMIC MODELING AND CONTROL OF QUADRUPED ROBOT WITH COMPLIANT LEGS.
Mr. Umesh Kumar Vishwakarma	DEVELOPMENT OF EDM PROCESS VARIANTS AND ANALYSIS OF THEIR EFFECTS ON PERFORMANCE MEASURES.
Mr. Vineet Kumar	AN INVESTIGATION OF MECHANICAL AND FRACTURE BEHAVIOR OF ULTRAFINE GRAINED 6082 AL ALLOY.
Mr. Sanjay Kumar Singh	NUMERICAL AND EXPERIMENTAL INVESTIGATIONS ON PARLLEL-FLOW THREE FLUID HEAT EXCHANGER.
Mr. Lalit Thakur	AN INVESTIGATION ON THERMAL SPRAY WEAR RESISTANT NANOSTRUCTURED COATING.
Mr. Kamal Sharma	NUMERICAL SIMULATION OF CRACK GROWTH PROBLEMS USING EFGM / XFEM.
Mr. AMIT BANSAL	FUSION JOINING OF ADVANCED MATERIALS USING MICROWAVE HYBRID HEATING.
Mr. Mihir Kumar Sutar	DESIGN DEVELOPMENT AND CONTROL OF MINIATURE ROBOT FOR IN VIVO BIOPSY.
Mr. Abhinav Gupta	CONDENSATION HEAT TRANSFER OF R-134a INSIDE HELICALLY COILED HORIZONTAL TUBES
Mr. Arijit Kundu	FLOW BOILING HEAT TRANSFER OF REFRIGERANTS THROUGH INCLINED TUBE.

Research Publication:

Journals Papers

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