

Academic Staff: 44, Students Admitted: UG/INT. M.Tech/M.Sc 213, PG 52, Ph.D. 31,  
Publications in: Journals 208, Conferences 43, Book/Books Chapters 05  
Projects: Research (Rs. in Lacs) 3547.05 , Consultancy (Rs. in Lacs) 202.93

## 1. SALIENT FEATURES

The Mechanical Engineering department at University of Roorkee was established in 1946. The starting batch of 15 students were awarded with their degrees in the year 1949. The second undergraduate program in Production and Industrial Engineering started in the year 1973. The department has been funded under several collaborative programs. In this regard, the department got welding research lab established with Indo German collaborative program. Further, in the year 1990-1991 the department was recognized as the Center of Advanced Studies (CAS) by the U.G.C in two areas namely Computer Aided Engineering and Industrial Noise Pollution and its control. Presently, the Department of Mechanical and Industrial engineering offers two undergraduate and five post graduate programmes.

The expertise by the faculty members of the department developed through research is being effectively utilized by providing solution to industrial problems in the form of design, analysis, testing and training through numerous industrial consultancies project from reputed private and government organizations. The department conducts National and International conferences to provide an insight of latest research trends in the field of Mechanical and Industrial engineering. The undergraduate students of the department are actively involved in student initiative activities like development of all-terrain vehicle, formula racing cars, wheel chair for disabled and elderly, robots etc.

## 2. LIST OF FACULTY MEMBERS

### i. Professors

**Arora, Navneet**, PhD (Kurukshetra University)

Welding Engineering, Joining of Dissimilar Materials, Process Modelling, Fracture Mechanics, Surfacing and Coatings

**Dutta, Sushanta**, PhD (IIT Kanpur)

Experimental fluid mechanics; Experimental heat transfer; Optical measurement techniques , Active and passive control of flow field, Wake Dynamics, Turbulence study; Schlieren, HWA, PIV, LCT , Micro fluidics, heat transfer augmentation using phase change material

**Dvivedi, Akshay**, PhD (IIT Roorkee)

Advanced Manufacturing Processes, Nontraditional Micro-machining, Metal Matrix Composites, Primary and Secondary Processing of MMC, Quality Management, QFD for service sector

**Dwivedi, D.K.**, PhD (MNIT, Jaipur)

Manufacturing: Welding & Surface Engineering, Mechanical Behaviour, Failure Analysis,, Friction Stir Welding, A-GTAW, Diffusion Bonding, Weldability

**Gandhi, B.K.**, PhD (IIT Delhi) **Head of Department**

Fluid Mechanics, Flow measurement, Artificial roughness and Computational fluid dynamics, Hydro-dynamic Machines, Hydraulic Turbines and Pumps, Performance Testing of SHP stations, Erosion wear, Slurry erosion and cavitation wear

**Gupta, Akhilesh**, PhD (UoR Roorkee)

Heat Transfer, Solar Energy, Refgn. & A/C, Energy Management, Fire Engineering, Boiling and Condensation, Solar Air and Water Heater, Energy Auditing, Pool Fire

**Harsha, S.P.**, PhD (BITS Pilani)

Machine Learning and Soft Computing Methods, Condition Monitoring of High Speed Ball Bearings, , Rail Dynamics & Whole Body Vibrations, CNT based Mass Sensors and Dynamics of Smart Structures (FGM)

**Jain, P.K.**, PhD (UoR Roorkee) (on EOL)

CAD/CAM, CAPP; Concurrent Engineering: Design for Manufacture, Design for Assembly, Tolerance Design, Manufacturing Systems, Modelling and Simulation, FMS, CMS, RMS, Agent Based Systems, Scheduling, Operations Management, Capacity Planning, Loading and Scheduling, Resource Planning, Machining Science, Conventional and Unconventional both (EDM, WEDM, ECM, ECH etc.)

**Jha, P.K.**, PhD (IIT Kharagpur)

Manufacturing Engineering, Metal Casting, Metal Matrix Composites, CFD based Modeling of Steelmaking Processes in Continuous Casting, Process Modeling (Physical & Mathematical Modeling)

**Kumar, Dinesh**, PhD (UoR Roorkee)

Industrial Engg, Process Planning & Optimization ,Modeling & Simulation, Supply chain Management, Maintenance Management, Financial management

**Kumar, Pradeep**, PhD (UoR Roorkee)

Industrial Engineering:, Quality Engineering, Taguchi's Method, Six Sigma, SPC Tools, QFD, Joining:, Microwave Joining of Bulk Materials, Composites, Advanced Manufacturing Processes:, Micro-Machining, Hybrid Machining, Non-Conventional Processes, Supply Chain Management, Global Supply Chain, Reverse Logistics, Green Supply Chains, 3PL, 4PL Logistics, Metal Casting:, Vacuum Sealed Molding, Evaporative Pattern Casting, Investment Casting, Casting Simulation

**Kumar, Ravi**, PhD (UoR Roorkee)

Thermal Engineering, Refrigeration & Air-Conditioning, Two-phase Flow & Heat Transfer, Instrumentation and Measurements ,

**Mishra, B.K.**, PhD (IT, BHU)

Solid Mechanics, Fracture Mechanics, Machine Design, Composite Materials, Vibrations, Fracture Mechanics, Damage Mechanics, FEA, Composite Materials, Elasticity and Plasticity

**Mishra, Manish**, PhD (IIT Kharagpur)

Broad Area:: Thermal and Fluids Engg, Renewable Energy, Desiccant Cooling, Specific Area:: Heat Transfer Enhancement, Heat Exchanger Design & Dynamics, Solar Thermal, Soft Computing Tools

**Pal, Kaushik**, PhD (IIT Kharagpur)

Synthesis and Modification of Advanced Nanomaterials, Targeted Drug Delivery (TDD) and Biomedical Implants, Energy Storage Applications, High Performance Toxic Gas Sensor, PMC's and MMC's for Structural, Automobile and Aerospace Applications

**Murugesan, K.**, (IIT Madras)

Thermo-Hydro-Mechanical Modeling of Concrete Exposed to Fire, Solar Assisted Ground Source Heat Pump, Development of new algorithms for the solution of Navier-Stokes equations using Finite Element Method, Energy, Underground coal gasification, Heat and moisture transport through porous materials with application to drying and nuclear waste di, Experimental Study on Microchannel Heat Transfer, Mathematical modeling of cooling towers for thermal power plants

**Pathak, P. M.**, PhD (IIT Kharagpur)

Robotics, Dynamics, Control, Bond Graph Modelling, Design

**Saran, V.H.**, PhD (IIT Roorkee)

Machine Design, Vehicle dynamics, Human response to vibrations, Fault diagnosis of bearings

**Sharma, A.K.**, PhD (IIT Madras)

Micromachining, Fabrication of Microchannels, Microholes, their characterisation., Advanced Manufacturing Processes, Hybrid Finishing Processes, Microwave Material Processing, In-situ Microwave Casting, Joining of Bulk Metal, Microwave Cladding, Surface Engineering, Cladding, Wear characterisation

**Sharma, Satish C.**, PhD (UoR Roorkee)

Tribology , Hydrodynamic/ Hydrostatic Lubrication, Hydrostatic/Hybrid thrust/journal Bearings, Non-Newtonian Rheology, Power law/cubic law model, couple stress fluid model, micropolar fluid model, ER/MR fluid model, Surface Topography, Surface Texturing, Vibration, Nonlinear Vibration Signature Analysis, Pinhole Defect, Mass Sensitivity , Diagnosis Analysis, Fault Diagnosis of Ball Bearings, Fault Diagnosis of Roller Bearings

**Singh, Inderdeep**, PhD (IIT Delhi)

Composite Materials; conceptualization and development, Manufacturing of Polymer and Metal Matrix Composites, Natural Fiber Based Green Composites

**Singh, Indra Vir**, PhD (BITS Pilani)

FEM, XFEM, Meshfree Methods, Isogeometric Analysis, XIGA, Multiscale Modeling, Phase Field Modeling, Fracture Mechanics, Damage Mechanics, Failure Analysis

**Singh, K.M.**, PhD (IIT Kanpur)

Computational Mechanics, Development of novel parallel algorithms, meshfree methods, shape and topology optimization, Fluid Dynamics, DNS/LES of turbulent flows, CAE, Computer-Aided Analysis and Design of Thermo-fluid and multi-physics systems, Computational Fluid Dynamics, Modeling and simulation of flow and heat transfer in turbomachines, transport and energy systems

**Tariq, Andallib**, PhD (IIT Kanpur)

Heat Transfer, Experimental Fluid Mechanics, Turbulence, Flow Visualization, Optical Techniques, Aerodynamics, Gas Turbine Blade Cooling, Thermal Contact Conductance, PIV, LCT, Hotwire anemometry

**Upadhyay, Sanjay**, PhD (IIT Roorkee)

Non-Linear Vibration Analysis and Control, Bearing Dynamics, Fault Diagnostic and Prognostic, Inflatable and Gossamer Structure/Antenna, Smart Materials and Structures,

ii. Associate Professors

**Bansal, Ankit**, PhD (The Pennsylvania State University)

Radiative heat transfer, Hypersonic Flow, Flow radiation interaction, spectral modelling of gases.

**Das, Arup Kumar**, PhD (IIT Kharagpur)

Two phase flow, Gas-liquid and liquid-liquid flow, Microfluidics, Filtration, Saliva flow, Boiling and condensation, Augmentation of boiling heat transfer coefficient, Bubble and drop dynamics, wettability gradient and electrowetting, Numerical methods, Lattice Boltzmann and Smoothed particle hydrodynamics

**Joglekar, M.M.**, PhD (IIT Bombay)

Solid mechanics, Nonlinear elasticity, Finite element methods, Structural dynamics, ., Mechanics of soft active materials, ., Bio-mimetic engineering, .

**Karunakar, D.B.**, PhD (IIT Kharagpur)

Manufacturing Science, Metal Casting, FEM in Manufacturing, CAD/CAM

**Kumar, Anil**, PhD (University of Trento, ITALY)

Machine Design, Mechanical Vibration, Vibration Mitigation, Magnetorheological (MR) and MRE Dampers, Piping Systems, Vibration Mitigation Systems, Elastomer Shock Isolators, Nonlinear Energy Sink Absorbers, Metamaterials in Vibration Mitigation, Structural Dynamics and Control, Structural Dynamic Testing, Identification and Monitoring, Pedestrian-Structure Interaction, Dynamics of Rail Vehicle, Semiactive Control of Indian Rail Vehicles at High Speed

**Mulik, R.S.**, PhD (IIT Delhi)

Machining (Conventional & Non-conventional), finishing processes, micro-machining, FSP&Welding, MMC, Rapid Prototyping

**Parashar, Avinash**, PhD (University of Alberta)

Design, Composites, Nanocomposites, FEM, Fracture Mechanics, damage mechanics, Continuum Mechanics, Nanomechanics, Graphene, CNT, h-BN nanosheets, nuclear materials

**Saxena, Dhish K.**, PhD (IIT Kanpur)

Optimization, Evolutionary Multi-objective Optimization, Multi-Criteria Decision Making, Big Data Analytics

**Subudhi, Sudhakar**, PhD (IISc Bangalore)

Natural and Forced convection, Natural Ventilation, Unconventional energy systems, Nanofluids

iii. Assistant Professors

**Basak, Shamik**, PhD (IIT Kharagpur)

Bulk and sheet metal forming processes, Plasticity for metal forming, Ductile damage models, Constitutive modeling, Formability tests, Characterization of materials, Failure prediction, Warm forming, Tailor welded blanks, Finite element modeling

**Ganapule, Shailesh**, PhD (University of Nebraska-Lincoln, USA)

Injury Biomechanics, High rate deformation of materials and structures, Wave propagation

**Gaur, Vidit**, PhD (Ecole Polytechnique, Paris)

Fatigue, Damage, Fracture, Design, Fracture Mechanics,, Modeling of Materials, Failure Analysis, FEM, CPFEM, Environmental Fatigue, Phase-Field

**Joglekar, D.M.**, PhD (IIT Bombay)

Guided Wave Propagation, NDE, Nonlinear dynamics, Computational mechanics, Finite and Spectral finite element methods for nonlinear problems in elastodynamics

**Mishra, Kirti Bhushan**, PhD (University of Duisburg-Essen, Germany)

Combustion and Fuels, Fire and Explosion Safety, Disaster/Incident modelling and prevention, CFD

**Pal, Siladitya**, PhD (Michigan Technological University, USA)

Multiscale Modeling of Heterogeneous Materials: [Fracture of Staggered Composites, Architected Materials ], Multiphysics Computational Modeling of Fracture: [Li-ion Battery Electrodes, Fracture of Polycrystalline Cathode ], Computational Solid Mechanics: [ Phase Field Fracture, Phase Transformation, Plasticity, Damage, Parallel Computing ], Metamaterials: Computational Modeling and Experiments [Elastic Wave Bandgap, Computational Homogenization]

**Sharma, Varun**, PhD (IIT Delhi)

Conventional Machining Processes, Machining, Non-Conventional Machining Processes, Machining and process optimization, Additive Manufacturing, Mechanical and biomedical applications

**Singh, Nikhil Kumar**, PhD (IIT Delhi)

Direct numerical simulation of two-phase flows, Multiphase flow, Phase change, Computational fluid dynamics and heat transfer, Numerical methods, Turbulent Flows

**Singh, Sneha, PhD (University of Warwick)**

Acoustics, Noise Control, Condition monitoring, Fault diagnosis, Nanomaterials

**Swain, Abinash, PhD (IISc Bangalore)**

Computer Aided Design (CAD), Geometric modelling, Product Design, Product Informatics, Knowledge representation and Reasoning, AI in Mechanical Engineering, High velocity impact Dynamics, Penetration and Perforation, Failure at high strain rate, Blast Modeling, Design of protective structures, Sandwich foam composite structure, Design of Automotive Systems, Crashworthiness and Occupant Safety.

**Choudhary, Amit, Ph.D. (IIT Kharagpur)**

Conventional Machining, Grinding/Finishing, Laser Material Processing, Additive Manufacturing

**1. HONOURS AND AWARDS TO FACULTY MEMBERS**

Name	Award	Institute	Year
Bansal, Ankit	Outstanding Teachers Award,	Indian Institute of Technology Roorkee	2020
Dwivedi, D. K.	Recognized in top 2% Global Scientists in Materials Domain	Elsevier-Stanford	2020
Gandhi, B. K.	Executive Committee Member	International Association of Hydraulic Research (IAHR)	2020
Harsha, S. P.	Recognized in top 2% Global Scientists in Vibrations and Acoustics Engg.	Elsevier-Stanford	2020
Pathak, P.M.	Panelist in VAIBHAV (Vaishwik Bharatiya Vaigyanik Summit), a Global summit of overseas and resident Indian scientists and academicians	Government of India	2020
Singh, Indra Vir	Recognized in top 2% Global Scientists in Mechanical Engg.	Elsevier-Stanford	2020
Singh, Sneha	Best Research Award in International Research Awards on New Science Inventions	Science Father, Scifax	2020

Gandhi, B.K.	ASME Fellow	American Society of Mechanical Engineers	2021
Ganpule, S. G	IED Innovator of the Year Award	National Security Guard	2021
Singh, Sneha	Review Editor for the journal of Frontiers in Mechanical Engineering	Frontiers Media, USA	2021
Akshay Divedi	Corona Karmaveer Samman	Amar Ujala. Award presented by Honourable Chief Minister, Uttarakhand	2021

**4. PARTICIPATION OF FACULTY IN CONFERENCES /SEMINAR /SYMPOSIA /WORKSHOP / GUEST LECTURES (NATIONAL & INTERNATIONAL).**

<b>NATIONAL</b>		
Name of Faculty	Venue	Date(Yr-mm)
Bansal, Ankit,	BHEL R&D Hyderabad	2020-08
Das, Arup Kumar	Indian Institute of Technology Roorkee	2020-08
Mishra, Manish	HRED, IIT Roorkee	2020-09
Harsha, S. P.	Malaviya National Institute of Technology , Jaipur	2020-11
Mishra, Manish	HRED, IIT Roorkee	2020-12
Mishra, Manish	HSSD (TEQIP), IIT Roorkee	2020-12
Singh, Inderdeep	Indo-US Virtual Workshop Resource Efficient Processing using Microwaves (REPRO)	2021-02
Ganpule, S. G.	Design Innovation Center , IIT Roorkee	2021-03
<b>INTERNATIONAL</b>		
Subudhi, Sudhakar	Satyug Darshan Institute of Engineering & Technology, Faridabad	2020-06
Kumar, Ravi	Washington DC, USA	2020-07
Sharma, Satish C.	Indian Institute of Planning and Management, Gurgaon	2020-07
Sharma, A. K.	IHM, KIT, Karlsruhe, Germany	2020-08
Sharma, A. K.	National Academy of Sciences Ukraine	2020-08

Sharma, A. K.	BITS Pilani Dubai Campus, Dubai	2020-08
Sharma, A. K.	Tokyo University of Science, Tokyo, Japan	2020-08
Sharma, A. K.	Sheraton Society Hill, One Dock St, Philadelphia, PA 19106, United States of America (USA).	2020-08
Sharma, A. K.	University of Manchester, Manchester, UK	2020-08
Sharma, Satish C.	Saintgits College of Engineering, Kottayam, Kerala	2020-08
Sharma, Satish C.	Saintgits College of Engineering, Kottayam, Kerala	2020-08
Pathak, P. M.	Saint-Raphael, France	2020-09
Dwivedi D.K.	Veer Surendra Sai University of Technology, Burla, Odisha	2020-09
Sharma, Satish C.	National Institute of Technology, Jalandhar (Punjab)	2020-09
Sharma, Satish C.	Veer Surendra Sai University of Technology Burla, Odisha	2020-09
Dwivedi, D. K.	India-UK SPARC Webinar on Metal Additive Manufacturing and Friction Stir Processing: Present and Future IIT Patna	2020-09
Dwivedi, D. K.	Advances in Mechanical Engineering, Jabalpur Engineering College, Jabalpur	2020-09
Sharma, Satish C.	Indian Institute of Technology Jammu	2020-11
Pathak, P. M.	ATAL sponsored FDP on Robotics, IIT Ropar	2020-11
Sharma, Satish C.	SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu	2020-12
Pathak, P. M.	BITS-Pilani, Hyderabad Campus	2020-12
Pathak, P. M.	Indo Korea Joint Network Centre for Robotics (Virtual)	2020-12
Dwivedi, D. K.	Recent advances in Joining Technologies - 2021, IEST, Shibpur, Howra	2021-01
Sharma, Satish C.	National Institute of Technology Sikkim	2021-03
Ganpule, S. G.	MACH conference, USA	2021-03
Gandhi, B. K.	30 <sup>th</sup> IAHR Symposium, Switzerland	2021-03

Singh, K. M.	30 <sup>th</sup> IAHR Symposium, Switzerland	2021-03
Harsha, S. P.	NPTI, Faridabad	2021-06

**5. TOTAL NUMBER OF FACULTY MEMBERS PARTICIPATED IN SHORT TERM COURSES**

<b>NATIONAL</b>			
Singh, Sneha	Acoustic Materials and Metamaterials	SWAYAM, and NPTEL	2020-06
Singh, K. M.	Basics and Applications of CFD	Thapar University, Patiala	2020-07
Singh, K. M.	Computational Fluid Dynamics	QIP Center, IIT-Roorkee	2020-07
Gandhi, B. K.	Advances in Fluid Flow Control and Measurement Techniques	QIP Center, IIT Roorkee	2020-08
Sharma, Satish C. and S.P. Harsha	A 5 Day Online International Course on "Fundamentals of Bogie Design"	RDSO, LUCKNOW	2020-10
Jha, P.K., Mishra, Manish	Advanced Pedagogy For Efficient Online Teaching During Pandemic Like Crisis	TEQIP, IIT Roorkee	2020-12
Swain, Abinash K., Karunakar, D.B.,	Recent Advances In CAD/CAM Applications	QIP Center, IIT-Roorkee	2021-03
Pathak, P.M.	Serial & Parallel Robots	SPARC, MHRD	2021-03

**6. DISTINGUISHED VISITORS TO THE DEPARTMENT (NATIONAL/INTERNATIONAL) - NIL -**

**7(a). INTERNSHIPS BY IIT – ROORKEE STUDENTS**

Sl. No.	Name of student	Name of the Internship Programme	Under Graduate	Post Graduate	Name of Institute Visited	Period
1	TANDON, AMOGH	Summer Training	B.Tech.		ITC Ltd.	

2	SHARMA, ANIKET	Summer Training	B.Tech.		Udaan	
3	ANNAM, RUCHITHA	Summer Training	B.Tech.		MyHashCode	
4	JAIN, ANSHUMAN	Summer Training	B.Tech.		SkinCurate	
5	JHA, ANURAG	Summer Training	B.Tech.		Bajaj Auto	
6	TANWAR, ANURAG	Summer Training	B.Tech.		Medicento & YoursBiz	
7	KHANDELWA L, ARPIT	Summer Training	B.Tech.		American Express	
8	RAJPUROHIT , BHARAT SINGH	Summer Training	B.Tech.		Larsen & Tourbo Infotech (LTI)	
9	KUMAR, DIVESH	Summer Training	B.Tech.		MTX Group	
10	SINGH, GURTEJ	Summer Training	B.Tech.		MyHashCode	
11	AKODIYA, HIMANSHU	Summer Training	B.Tech.		LetsDressUp	
12	ISSHITA	Summer Training	B.Tech.		ITC Ltd.	
13	CHADARAJU PALLI, JASWANTH	Summer Training	B.Tech.		Medicento & YoursBiz	
14	RAINA, MAHEK	Summer Training	B.Tech.		Hindustan Unilever Limited	
15	CHAUDHARY, MANAS	Summer Training	B.Tech.		Microsoft India Pvt. Ltd.	
16	BHANSALI, NISHANT	Summer Training	B.Tech.		Axis Bank	
17	NOOR, NISHA	Summer Training	B.Tech.		Hindustan Unilever Limited	
18	GUPTA, PARTH	Summer Training	B.Tech.		Droom Technology (P) Ltd.	
19	KULKARNI, PRADDYUMN	Summer Training	B.Tech.		Tata Steel	

	A ANIRUDDHA					
20	GUPTA, ROHAN	Summer Training	B.Tech.		Micron Technology Operations India	
21	GUNTEWAR, RUCHIKA ATUL	Summer Training	B.Tech.		Citi (CSC Pune)	
22	CHOUDHARY , SAAKSHI	Summer Training	B.Tech.		I'm Beside You	
23	KOOLWAL, SAMARTH	Summer Training	B.Tech.		Tata Steel	
24	KUMAR, SANDEEP	Summer Training	B.Tech.		Larsen & Turbo Infotech (LTI)	
25	KHANDELWA L, SHANU	Summer Training	B.Tech.		JPMorgan Chase & Co.	
26	JAISWAL, SOUMYAJEE T	Summer Training	B.Tech.		Hindustan Unilever Limited	
27	THAKKAR, SWAPNIL	Summer Training	B.Tech.		Tata Steel	
28	RAMI, TAMANNA	Summer Training	B.Tech.		Tata Steel	
29	VADAPARTHI , SAI SANJANA	Summer Training	B.Tech.		Bajaj Auto	
30	SRIVASTAVA, ADITYA KUMAR	Summer Training	B.Tech.		Microsoft India Pvt. Ltd.	
31	JUNGADE, APURVA MAHENDRA	Summer Training	B.Tech.		Fractal Analytics Pvt. Ltd.	
32	BARMAN, DEBADITYA	Summer Training	B.Tech.		Udaan	
33	BADALA, HIMANSHU	Summer Training	B.Tech.		Larsen & Turbo Infotech (LTI)	
34	GUPTA, MAYANK	Summer Training	B.Tech.		Larsen & Turbo Infotech (LTI)	

35	PATEL, KEVIN MANISHKUM AR	Summer Training	B.Tech.		Udaan	
36	JOSHI, PRAKRATI	Summer Training	B.Tech.		Larsen & Tourbo Infotech (LTI)	
37	SHARMA, RISHABH	Summer Training	B.Tech.		Publicis Sapient	
38	GUPTA, SEJAL	Summer Training	B.Tech.		American Express	
39	SHARAT RAJ	Summer Training	B.Tech.		Medicento & YoursBiz	
40	AGRAWAL, SHUBHAM	Summer Training	B.Tech.		Larsen & Tourbo Infotech (LTI)	
41	MADNI, TABISH	Summer Training	B.Tech.		MyHashCode	
42	BANSAL, VIPUL	Summer Training	B.Tech.		American Express	
43	Ahirrao, Dhiraj Narhari	Summer Training		M.Tech.	Sciative Solutions	
44	Verma, Aman	Summer Training		M.Tech.	Larsen & Toubro Limited / Searce	
45	Pawar, Prateek Shamprasad Chhaya	Summer Training		M.Tech.	Bajaj Auto Ltd.	
46	Bansal, Pragati	Summer Training		M.Tech.	Larsen & Toubro Limited / Tata Consultancy Services Limited	
47	Sharma, Abhinav Kumar	Summer Training		M.Tech.	Eaton	
48	Chauhan, Akshay	Summer Training		M.Tech.	Cognizant Technology Solutions	
49	Rahman, Habibur	Summer Training		M.Tech.	Tata Advanced Systems Pvt. Ltd.	
50	Roy, Sudeep	Summer Training		M.Tech.	Tata Advanced Systems Pvt. Ltd.	

51	Patel, Priyam	Summer Training		M.Tech.	Eaton	
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### 7(b). INTERNSHIPS OFFERED TO OTHER STUDENTS IN IIT – ROORKEE

Sl. No.	Name of student	Name of Supervisor	Under Graduate	Post Graduate	Name of Collaborative Institute	Period
1	Yash Paresh Bhardava	Dr. Sudhakar Subudhi	B Tech		NIT Surat	May-July-2021

### 8. ACADEMIC ACTIVITIES ORGANIZED BY THE DEPARTMENT

Name of the conf./seminar/symp./workshop	Name of the Chairman	Sponsored by	Dates
Advanced Pedagogy For Efficient Online Teaching During Pandemic Like Crisis	Jha, P.K., Mishra, Manish	TEQIP, IIT Roorkee	2020-12
Quality Management & Business Process Reengineering	Kumar Pradeep Dvivedi Akshay	QIP Center, IIT-Roorkee	2020-12

### 9. SPONSORED RESEARCH PROJECTS:

Sl. No.	Project Status	Total No. of Projects	Amount (Rs. in lacs)
1	Completed Projects	14	508.58
2.	Ongoing Projects	36	2314.63
3.	New Projects	11	723.84

### 10. SERVICE TO INDUSTRIES

#### a. Consultancy Project

Sl.No.	Project Status	Total No. of Projects	Amount (Rs. in lacs)
1	Completed Projects	11	76.84
2.	Ongoing Projects	08	126.09
3.	Total Projects	19	202.93

## **11. SUMMARY OF MAJOR SPONSORED RESEARCH SCHEMES AND CONSULTANCY PROJECTS (Rs. 20 lacs) (A brief write-up upto 100 words) (New projects during the year).**

1. Investigation of Unsteady Flow Phenomena on a Flapping Wing and Its Control Using Synthetic Jet Sponsor : Aeronautics Research & Development Board, DRDO

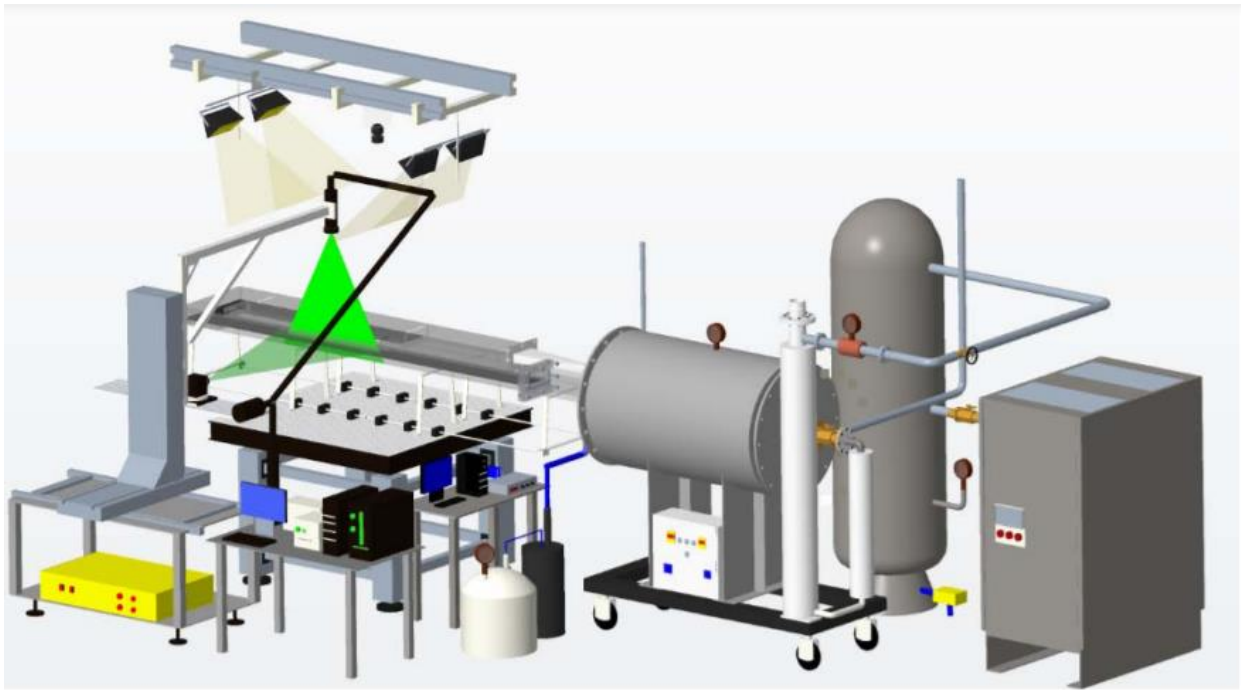
### **Prof. Sushanta Dutta**


Birds and insects display a combination of take-off, climb, hover, maneuver, cruise, stealth, and gust response capabilities that are often superior to that of human-made conventional fixed-wing vehicles. It has wide range application starting from surveillance, spying, military and disaster control. At a small scale, the flapping wing is more efficient than the traditional fixed-wing. The flapping motion is a combination of rotation and translation with translation varied in simple harmonic motion, and rotation is confined to a short period around stroke reversal. The flapping propulsion requires a control system which can actively regulate the vortex formation and stability of leading-edge vortex. The flapping motion of flexible wings is a highly non-linear fluid-structure interaction problem. As the flow phenomena over flapping wings itself are very complex, no concrete mechanism for controlling the flow phenomena has yet been developed. For the development of lift and thrust, the leading-edge vortices (LEV) are important. The stability of the leading-edge vortex is dependent on the development of span-wise flow (three dimensional) that creates a balance between the creation of vorticity at the leading edge of the wing and transport of the vortices in the wake. The proposed work is to develop a control strategy to manipulate the leading-edge vortex with the synthetic jet to generate more lift for both of the strokes of the wing.

2. Development of Ultra-high Speed Optical Diagnostic Methodology Based upon Modern High Speed Framing Camera System Sponsor : Defence Research & Development Organisation (4.2 Crores)

### **Prof. Andallib Tariq**

The new discoveries and improved knowledge in the fields of detonics, shock analysis and supersonic aerodynamics are largely dependent upon the challenges of high speed imaging and visualizations. The analysis of such event is extremely challenging task, but carries critical scientific implications. Objective of the proposed work is to develop a methodology based upon ultra-high speed digital framing cameras (billion shot framing cameras) by performing the laboratory scale experiments. The test facility at (Aerodynamics Visualization & Thermal Analysis Research) lab at MIED will be used to carry out the experiments for the development of proposed technology. The concept of supersonic cavity flow arrangement, which are encountered in high-speed aircraft and rockets will be used to simulate the high speed induced event.



*A state-of-the-art experimental facility for LCT and PIV measurements at *

3. Development of Microfluidic Bottle Cap for Wastewater Treatment and Recovery Systems for Water Reuse Sponsor : Department of Drinking Water and Sanitization

**Prof. Arup Kumar Das**

**Summary:** Present project deals with the development of a handheld filtration device that can convert contaminated dirty flood water into clean drinkable water. To convert flood water to drinkable water, ultrafiltration is required to sieve out the unwanted additions from the water. Microfabricated filters embedded inside microfluidic analytical systems will be implemented to separate micro and nanoparticles from a flooded water sample. A bead-based assay will be developed to trap and detect viral particles along the microfilter. Microfluidic devices featuring a number of microfilters can be developed for the conversion of contaminated flooded water to drinkable clean water. We propose to perform numerical simulations first to obtain the configuration of the microfluidic filter. Based on the knowledge of numerical simulations, innovative designs will be proposed for the filtration process with high efficiency and throughput. Fabrication of one layer of microchannel will be done in-house and tested for different contamination levels. After characterizing the filtration process, we plan to pack a number of such filters in a device that will be multiplexing the throughput and delivering a high filtration output. To this water treatment and disinfection modules will be integrated. The proposed device can be directly used to convert contaminated floodwater into drinkable clean water.

4. Experimentation modelling and validation of fouling in air cooled condenser Sponsor : ISHRAE / FIRST

**Prof. Arup Kumar Das**

**Summary:** Fouling in condenser is not known to the scientific community yet. The intent of this research is to build a better base of knowledge regarding airside fouling for heat exchangers and the impact that it has on performance. Efforts will be made to propose a generalized correlation for prediction of remaining useful life of the heat exchangers.

Based on the confidence level of the proposed correlation, a predictive tool will be developed with the help of a statistical network.

5. Solar Assisted Liquid Desiccant Cooling System using single storage, Sponsor : DST

**Prof. Sudhakar Subudhi**

There are three main objectives of the proposal based on the solar liquid desiccant cooling system. First is to use a single storage tank for dil. and conc.  $\text{CaCl}_2$  solution for liquid desiccant cooling system and to utilize the solar energy for maintaining a thermal stratification in the storage tank. The second objective is to utilize the stored heat in the storage tank to regenerate the dehumidifier. The last objective is to characterize the transient heat and mass transfer processes and fluid dynamics in the storage tank. The PLIF system measures the intensity of fluorescence in the imaging plane and provides 2-D  $\text{CaCl}_2$  mass fraction distributions. The PIV system will measure the 2-D displacement of neutral density particles that follow the flow. The temperature, conductivity and mass flow measurement will be acquired using different instruments, such as data acquisition system, flow meter etc.

6. Multiphase Analysis of Inclusion Transport and Removal in Continuous Casting Products with Use of Electromagnetic Stirrer Sponsor : SERB, DST

**Prof. Pradeep K. Jha**

The main sources of origin of inclusions in molten steel are from the upstream process, tundish wall erosion, entrained slag, and reoxidation phenomena. The mechanism of generation, transport and removal of inclusions from molten steel under the flux/slag environment can be studied by multiphase flow analysis in the domain. Use of magnetohydrodynamic (MHD) devices like brakes/stirrer in tundish/mold have been a regular practice in steel industries. Stirring the molten steel in the specific region of the mold is generally used to change the flow pattern, which is also expected to affect the inclusion transport and the solidification characteristics in the mold. A detailed understanding of the effect of these devices on flow behaviour, heat transfer and inclusion transport under multiphase environment is necessary for further improvement in quality of caster. It can be of great importance for the steel makers by providing additional guidelines towards the effort of cleaner steel production. This project aims at the multiphase modeling of continuous casting with particular emphasis on inclusion transport and its removal with or without the use of MHD devices.

7. Higher order and adaptive time integrators for fully coupled chemo-mechano-reaction problem

**Prof. Siladitya Pal**

In the proposed project we will develop a strongly coupled solution algorithm for the chemo-mechano-reaction system. Thus, illustrating comparative analysis comprising a family of higher order time-integration schemes based on diagonally implicit Runge-Kutta methods (DIRK), the outcome will provide a suitable pathway in selecting proper schemes. Additionally, time adaptivity will essentially augment the framework in solving the complex system in a time efficient manner.

8. Dynamic modelling and simulations of human body subjected to mechanical loads during spaceflight and operations in space

**Prof. S. G. Ganpule**

We are developing an indigenous, full-body computational model of a healthy, Indian male. The model will be used to simulate spaceflight environments in astronauts. This model and data are critical for the prestigious Gaganyaan mission of ISRO.

9. Deployment Mechanism for 12m Diameter Spacecraft Antennas STC- 1561-MID (STC-O6)

**Prof. S. H. Upadhyay**

The proposed study is directly relevant to SAC/ISRO for the development of deployable mechanisms for large size antenna reflectors for forthcoming projects. Many concepts are world widely used and launch. Still, there is a lot of scope for further investigation in the exploration of a new concept for highly accurate deployable configuration for large diameter satellite antenna. The proposed work mainly focuses on the development of new concepts for 12m diameter satellite antenna, which has not been attempted in SAC/ISRO so far. The proposed investigation will be useful in the development of deployable mechanisms for large size antenna reflector for forthcoming ISRO's communication, remote sensing, and interplanetary missions.

10. Experimental and numerical analysis for development of an erosion friendly Francis turbine

**Prof. Bhupendra K Gandhi**

The project aims to evaluate the sediment erosion wear of Francis turbine at different operating conditions by measurement of thickness loss through 3D digitization to identify the wear prone zones of the turbine runner. The zones will be analysed through numerically analyse of the flow field of the Francis turbine for water performance and two-phase flow using a commercial CFD code. Finally design modification of Francis turbine will be suggested for better sediment resistive property.

**12. SCIENTIFIC AND TECHNICAL REPORTS - NIL -**

**13. RESEARCH PUBLICATION**

S.No	Details	Total Numbers
(a)	National Conference/ Symp. / Seminars	06
(b)	International Conference/Symp./ Seminars	37
(c)	National Journals	03
(d)	International Journals	208

### (a) National Conference/ Symp./ Seminars

1. Mittal, S., Aggarwal, D., and Saxena, D. K., Innovative Design of Hydraulic Actuation System for Operator Fatigue Reduction and Its Optimization; **Advances in Multidisciplinary Analysis and Optimization, Lecture Notes in Mechanical Engineering, Springer, 2020.**
2. Geleta Fekadu, Sajesh M, Singh Kalpana and Subudhi, Sudhakar, Experimental study of Internally Cooled Liquid Desiccant Dehumidifier Assisted by Solar Regeneration, **FMFP-2020, IIT Guwahati, Dec.09-11, 2020.**
3. Kumar, Aditya, and Subudhi, Sudhakar, Thermal instability in the open cavity turbulent natural convection, **FMFP-2020, IIT Guwahati, Dec.09-11, 2020.**
4. Das, Shashikant, and Subudhi, Sudhakar, Study of thermoregulation of the human body using the steady-state energy balance model, **FMFP-2020, IIT Guwahati, Dec.09-11, 2020.**
5. Das, Shashikant, and Subudhi, Sudhakar, Study of body temperature and different modes of heat transfer using steady-state energy balance model, **EMSME-2020, NIT Delhi, Oct.30-Nov.1, 2020.**
6. Kumar, Deepak, Kumar, Aditya, and Subudhi, Sudhakar, MHD free convection of magnetite nanofluid in cooling of an electronic component, **FMFP-2020, IIT Guwahati, Dec.09-11, 2020.**

### (b.) International Conference/ Symp./ Seminars

1. Mittal, S., Saxena, D. K., and Deb, K., A Unified Automated Innovization Framework Using Threshold-based Clustering; **IEEE Congress on Evolutionary Computation (CEC), 1-8, 2020.**
2. Garg, K., Mukherjee, A., Mittal, S., Saxena, D. K., and Deb, K., A Generic and Computationally Efficient Automated Innovization Method for Power-Law Design Rules; **GECCO '20: Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion, 161-162, 2020.**
3. Mittal, S., Saxena, D. K., and Deb, K. Learning-based Multi-Objective Optimization Through ANN-Assisted Online Innovization; **GECCO '20: Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion, 171-172, 2020.**
4. Kumar, Anish, Mangla, Sachin Kumar, Kumar, Pradeep, Kayikci, Yasanur, "Investigating Enablers to Improve Transparency in Sustainable Food Supply Chain Using F-BWM." **International Conference on Intelligent and Fuzzy Systems, 567-575, 2020.**
5. Ali, Nishab, Sharma, Vaibhav, and Tariq, Andallib, and Mishra, Manish, Flow Investigation at U – Turn With and Without Matrix in a Two Pass Rectangular Duct by Using Stereo PIV **8<sup>th</sup> International and 47<sup>th</sup> National Conference on FMFM, Guwahati, India, Dec 09-11, (2020)**
6. Ali, Nishab, Sharma, Vaibhav, and Tariq, Andallib, and Mishra, Manish Flow Investigation of U-Turn in an Internal Serpentine Passage by Using Stereo PIV, **8<sup>th</sup> International and 47<sup>th</sup> National Conference on FMFM, Guwahati, India, Dec 09-11, (2020)**

7. Chawla, Ishan, Pathak, Pushparaj Mani, Notash, Leila Samantaray, Arun Kumar, Li, Qingguo, and Sharma, Umesh Kumar, Miniaturization of a Planar Cable-Driven 3D Printer using Optimization, **International Conference on Manipulation, Automation and Robotics at Small Scales (MARSS), Toronto (2020)**.
8. Pachouri, Vipin, and Pathak, Pushparaj Mani, Inverse Kinematic Model of a Cable-Driven Continuum Manipulator, **1st International & 13th National conference on Industrial Problems on Machines and Mechanisms (IPRoMM-2020), December 21-22, 2020, BITS-Pilani, Hyderabad Campus**
9. Mishra, Utkarsh Aashu, Chawla, Ishan, Pathak, Pushparaj Mani, On Determining Shortest Path in Joint Space of a Cable-Driven Parallel Robot for Point-to-Point Motion Conference: **2020 28th Mediterranean Conference on Control and Automation (MED), 2020, France**.
10. Tomar, Adesh Kumar, Sharma, Satish C., "Influence of span angle on the performance of hole-entry hybrid spherical journal", **Virtual International Conference (TRIBOINDIA -2020), SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, December 10-12, 2020**.
11. Sahu, Krishnkant, Sharma, Satish C., "Influence of textured shapes in hybrid slot entry journal bearing", **Virtual International Conference (TRIBOINDIA -2020), SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, December 10-12, 2020**.
12. Agrawal, Nitin, Sharma, Satish C., "Study of a Hybrid Spherical Capillary Compensated Thrust Bearing", **Virtual International Conference (TRIBOINDIA -2020), SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, December 10-12, 2020**.
13. Kumar, Abhishek, Sharma, Satish C., "On the behaviour of asymmetric conical hole-entry hybrid journal bearing system", **Virtual International Conference (TRIBOINDIA -2020), SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, December 10-12, 2020**.
14. Singh, Anil, Sharma, Satish C., "FEM Analysis of a Porous Hybrid Journal Bearing Under the Turbulent Regime", **Virtual International Conference (TRIBOINDIA -2020), SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, December 10-12, 2020**.
15. Kumar, Narendra, Sharma, Satish C., "Effect of semi-cone angle on the performance of hybrid slot-entry conical journal", **Virtual International Conference (TRIBOINDIA -2020), SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, December 10-12, 2020**.
16. Maurya, Tara Chand Kumar, and Dutta, Sushanta Numerical Simulation of Two immiscible Liquids Flow in T-microchannel using Level-Set-Method **8th International and 47th National Conference on FMFP, Guwahati, India, Dec 09-11, (2020)**.
17. Sharma, Vikas, and Dutta, Sushanta, Experimental Methodology for Shear Stress Analysis of a Bio-Inspired Riblet Surface, **8th International and 47th National Conference on FMFP, IIT Guwahati, India, Dec 09-11, (2020)**.
18. Sharma, G., Dwivedi, D.K., Diffusion bonding of 304 austenitic stainless-steel using pressure pulses, *Materials Today: Proceedings* 44, (2021) 2135-2141

19. Kaushik, Pankaj, Dwivedi, D. K., Selective Induction Heating in FSW of Al-Steel Combination" presented in **"28th International Conference on Processing and Fabrication Of Advanced Materials (PFAM 28)" held at VIT University, Chennai, Dec 7-9, 2020.**
20. Kumar, S., Karunakar, D.B., Enhancement of shell permeability and effect of shell thickness and firing temperature on Al-Si alloys in investment casting process; **International Conference on Smart Technologies for Energy, Environment and Sustainable Development, 4th-5th December 2020, GHRCE Nagpur, India.**
21. Khalkho. J. S, Vidyasagar, Ch. S., Karunakar, J. S., Evaluation of microstructure and mechanical properties of Al-TaC composites developed by multi-step stir casting process; Proceedings of the ASME 2020, **15th International Manufacturing Science and Engineering Conference MSEC2020, September 3, 2020, Virtual, Online.**
22. Rana, R., Karunakar, D. B., Karmakar, A., Influences of different tool profiles and process parameters on mechanical properties of dissimilar AA6061 and AA7075 aluminium alloys by friction stir welding; **International Conference on Innovative Engineering Design (ICOIED)-2020, January 18-20, 2020 (published on Advances in Engineering Design. Lecture Notes in Mechanical Engineering. Springer, Singapore. [https://doi.org/10.1007/978-981-33-4018-3\\_19](https://doi.org/10.1007/978-981-33-4018-3_19)).**
23. A.S. Gangwar, Y. Agrawal, D. M. Joglekar, "Nonlinear Frequency Mixing in GFRP Laminate with a Breathing Delamination", **In proceedings of European Workshop on Structural Health Monitoring, 2020, page: 825-836.**
24. Kumar, Naveen, and Arora, Navneet 'Welding of Nitrogen Containing Austenitic Stainless Steel Using GMAW Process', 11<sup>th</sup> International Conference on Materials Processing and Characterization (**ICMPC 2020**), IIT Indore, **15 December - 17 December, 2020. (Published in Materials Today: Proc., January (2021).**
25. Upadhyay, Krishan, Das, Shashikant, Rajasekar, Elangovan, Subudhi, Sudhakar, Impact of Air velocity on Thermal Comfort during Sedentary Activity in a Controlled Climatic Chamber, **IAQ 2020, Athens, Greece ,Sept. 13-15, 2021.**
26. Singh, Ramver, Dwivedi, Akshay, Kumar, Pradeep, "Evaluation of the Surface Integrity of Titanium Nitride Coating Deposited on the Ni-Ti Substrate Through the Near-Dry Electrical Discharge Surface Coating Process." **TMS 2021 150th Annual Meeting & Exhibition Supplemental Proceedings, 421-429, 2021.**
27. Kumar, Tinku, Degala, Venkata Kiran and Arora, Navneet, 'Sheet metal joining and distortion measurement of aluminium alloy and steel in cold wire GTAW process', **International Conference on Materials Manufacturing and Characterization. (ICMPC 2020), IIT Indore, Materials Today Proceedings 2021.**
28. Sharma, S., Gandhi, B.K., "Experimental investigation of sediment erosion of turbine steel used in Bhilangana-III power-plant", **30th IAHR Symposium on Hydraulic Machinery and Systems, Lausanne, Switzerland, on March 21-23, 2021.**
29. Kumar, Sandeep, Khullar, Subodh, Cervantes, Michel J., and Gandhi, Bhupendra K., Proper orthogonal decomposition of turbulent swirling flow of a draft tube at part load, **30th IAHR Symposium on Hydraulic Machinery and Systems, Lausanne, Switzerland, on March 21-23, 2021.**

30. Kumar, Sandeep, Khullar, Subodh, Cervantes, Michel J., and Gandhi, Bhupendra K., A Reaction Turbine Test Rig to Investigate Flow Instabilities in Draft Tube, **30th IAHR Symposium on Hydraulic Machinery and Systems, Lausanne, Switzerland, on March 21-23, 2021.**
31. Khullar, Subodh, Kumar, Sandeep, Singh, Krishna M., Cervantes, Michel J., and Gandhi, Bhupendra K., Influence of the runner cone design on the pressure fluctuations in the draft tube of a low head Francis turbine, **30th IAHR Symposium on Hydraulic Machinery and Systems, Lausanne, Switzerland, on March 21-23, 2021.**
32. Naik, Tejas Pramod, Gairola, Sandeep, Patowari, Pramod Kumar, Singh, Inderdeep, Wire electrical discharge machining of AA6063/B<sub>4</sub>C composite fabricated by stir-casting process, **International Conference on Technological Advancements in Materials Science and Manufacturing ICTAMSM 2021, Graphic Era University, Dehradun, February 2021.**
33. Chawla, Ishan, Pathak, Pushparaj Mani, Notash, Leila Samantaray, Arun Kumar, Li, Qingguo, and Sharma, Umesh Kumar, Neural Network-Based Inverse Kineto-Static Analysis of Cable-Driven Parallel Robot Considering Cable Mass and Elasticity, **Fifth International Conference on Cable-Driven Parallel Robots (CableCon 2021), July 07-09, 2021.**
34. Chawla, Ishan, Pathak, Pushparaj Mani, Notash, Leila, Samantaray, Arun Kumar, Li, Qingguo, and Sharma, Umesh Kumar, Effect of Selection Criterion on the Kineto-Static Solution of a Redundant Cable-Driven Parallel Robot Considering Cable Mass and Elasticity, **Mechanism and Machine Theory 156 (2021) 104175.**
35. Akhilesh Kumar Tiwari, Akshay Dvivedi, and Kaushik Pal, "Thermal modelling of EDM process using FEA and parametric study of MRR", **AIP Conference Proceedings** 2341, 040042 (2021) <https://doi.org/10.1063/5.0053546>
36. Ranjeet Singh Rathore, and Akshay Dvivedi, "Investigation of Active Surface Area and Peak Current on Discharge Energy During the ECDM Process", Online International Conference on Sustainable Engineering (ICSE-2021) February 26-27, 2021, ECB Bikaner
37. Rajendra Kumar Arya, B. A Naidu and Akshay Dvivedi, "Investigation of exerted load on work material during micro-machining of glass using ECDM process", **International Conference on Industrial and Manufacturing Systems" (CIMS-2020) from 9th - 11th Oct. 2020, Dr B R Ambedkar NIT Jalandhar, Punjab, INDIA**

### (c) National Journals

1. Sudhakar T., Das, A.K., Evolution of Multiphase Lattice Boltzmann method: A Review, **Journal of The Institution of Engineers (India): Series C. 101**, (2020) .p. 711-719.
2. Dhawan, Vikas, Debnath, Kishore, Singh, Inderdeep, and Singh, Sehijpal, "Neural network modeling of forces in drilling of glass/epoxy composites filled with agro-based waste materials." **Indian Journal of Engineering and Materials Sciences (IJEMS)** 27, no. 3 (2021): 649-658.

3. Mozammil, S., Koshta, Eklavya, and Jha, P. K., "Abrasive wear investigation and parameteric process optimization of in-situ Al-4.5%Cu-xTiB<sub>2</sub> composites" **Trans Indian Inst Metals**, vol. 74(3), (2021)pp. 629-648.

#### (d) International Journals

1. Tiwari Prashant, Upadhyay, S. H., "Advance spectral approach for condition evaluation of rolling element bearings", **ISA Transactions**, 103(2020) 366–389. (Elsevier).
2. Kapoor, S., Saxena, D. K., Leeuwen, M. V., Discovering subjectively interesting multigraph patterns; **Machine Learning**, 109(8), (2020) 1669-1696
3. Li, Y., Tian, M., Wang, Y., Zhang, Q, Saxena, D. K., and Jiao, L., A new replica placement strategy based on multi-objective optimisation for HDFS; **International Journal of Bio-Inspired Computation**, 16(1), (2020) 13-22
4. Kannojiya, V., Das, A. K., Das, P. K., Numerical simulation of centrifugal and hemodynamically levitated LVAD for performance improvement. **Artificial Organs**, 44(2), (2020) pp.E1-E19.
5. Ghosh, S., Dubey, A. K., Das, A. K., Numerical Inspection of Heterogeneity in Materials using 2D Heat-Conduction and Hybrid GA-tuned Neural-Network. **Applied Artificial Intelligence**, 34(2), (2020) 125-154..
6. Kannojiya, V., Das, A. K., Das, P. K., Proposal of hemodynamically improved design of an axial flow blood pump for LVAD. **Medical & Biological Engineering & Computing**, 58(2), (2020) pp.401-418.
7. Ajay, K., Kumar, R., Mukhopadhyay, D., Gokhle, O., Gupta, A., Das, A. K., Influence of PT-CT contact on PHWR fuel channel thermal behaviour under accident condition—An experimental study. **Nuclear Engineering and Design**, (2020) 110543.
8. Silvi, L. D., Saha, A., Chandraker, D. K., Ghosh, S. Das, A. K., Numerical analysis of pre-dryout sequences through the route of interfacial evolution in annular gas-liquid two-phase flow with phase change. **Chemical Engineering Science**, 212, (2020) 115356.
9. Rohilla, L., Das, A. K., Fluidics in an emptying bottle during breaking and making of interacting interfaces. **Physics of Fluids**, 32, (2020) 042102.
10. Ajay K., Kumar R., Gupta A., Gokhle O., Mukhopadhyay D., Das A. K., Experimental simulation of channel heat-up behaviour under slumped fuel pin condition for Indian PHWR. **Annals of Nuclear Energy** 146, (2020) 107615.
11. Darshan M. B., Das, A. K., Kumar, Ravi, Enhancement of Heat Transfer during Evaporation of R407C by Providing Discrete Structures Inside Tube. **J. Enhanced Heat Transfer** 27(6), (2020) 527-544.
12. Gunipe Prashant K., Das A. K., Development of microfluidic chip for dilation of slurry. **Microfluidics and Nanofluics** 24 (2020) 79.
13. Sudhakar T., Das, A. K., Bypass of a Liquid Taylor Drop through Successive Bends in a Rectangular Channel, **Industrial & Engineering Chemistry Research** 59(42), (2020) 19045-19061.
14. Kumar, Aditya, Subudhi, Sudhakar, "Thermal fluctuations and boundary layer properties of turbulent natural convection inside open cavities of different dimensions heated from below", **Physics of Fluids**, 32, (2020) 067114,
15. Lautre, Nitin Kumar, Sharma, Apurbba Kumar, Kumar, Pradeep, Das, Shantanu, "Experimental Evaluation of a Microwave Drilling Process in Perspex." **Journal of Testing and Evaluation**, 48 (4), (2020) 2880-2894,
16. Jawalkar, C. S., Sharma, Apurbba Kumar, Kumar, Pradeep, "Innovations in electro chemical discharge machining process through electrolyte stirring and tool

- rotations." **International Journal of Machining and Machinability of Materials**, 22 (6), (2020) 487-503.
17. Singh, Ramver, Dvivedi, Akshay, Kumar, Pradeep, "EDM of high aspect ratio micro-holes on Ti-6Al-4V alloy by synchronizing energy interactions." **Materials and Manufacturing Processes** 35 (11), (2020) 1188-1203,
  18. Kumar, Anish, Mangla, Sachin Kumar, Kumar, Pradeep, Karamperidis, Stavros, "Challenges in Perishable Food Supply Chains for Sustainability Management: A Developing Economy Perspective." **Business Strategy and the Environment** 29 (5), (2020) 1809-1831,
  19. Aasi, Harpreet Kaur, Mishra, Manish, Detailed Design Optimization of Three-Fluid Parallel-Flow Plate-Fin Heat Exchanger Using Second Law Analysis **ASME - Journal of Heat Transfer**, 142, (2020) 081901-1-12.
  20. Aasi, Harpreet Kaur, Mishra, Manish, Influence of Flow Non-Uniformity on the Dynamic Behaviour of Three-Fluid Cross-Flow Compact Heat Exchanger **International Journal of Thermal Sciences**, 149, (2020) 106177.
  21. Solanki, Anand, Kumar, Ravi, Condensation Frictional Pressure Drop Characteristic of R-600a inside the Horizontal Smooth and Dimpled Helical Coiled Tube in Shell Type Heat Exchanger, **Int J Thermal Sciences**, 154, (2020) 106406,
  22. Kumar, Naveen, Arora, Navneet, Goel, S. K., 'Slurry erosion study on nitrogen alloyed austenitic stainless steel and weld beads', **Tribology Letters**, 68,(3) (2020), 1-16.
  23. Kumar, Tinku, Kiran, Degala Venkata, Cheon, Jason, Arora, Navneet, 'Probing the influence of cold wire gas tungsten arc welding current waveforms on the aluminum-steel joining', **Journal of Manufacturing Processes**, 59, (2020) 378–388,
  24. Kumar, Naveen, Arora, Navneet, Goel, S. K., 'Weld joint properties of nitrogen-alloyed austenitic stainless steel using multi-pass GMA welding', **Archives of Civil and Mechanical Engineering**, 20, 3, (2020) 1-13,
  25. Singh, Ankit R., Tariq, Andallib, Majumdar, Prasanna, Experimental study on thermo-mechanical deformation of PHWR channel at elevated temperature, **Nuclear Engineering and Design, (Elsevier)**, 364, (2020)10634; 15 pages;
  26. Siddappa, P. G., and Tariq, Andallib, Contact area and thermal conductance estimation based on the actual surface roughness measurement, **Tribology International, (Elsevier)**, 148, (2020), 10635837 13 pages;
  27. Sidappa P. G., Tariq, Andallib, Metal and dielectric contact heat transfer and enhancement study using finite element approach, **Heat and Mass Transfer, (Springer)**, 56, (2020), 2893–2908, 16 pages;
  28. Mozammil, S., Verma, Raviraj, Karloopia, J., Jha, Pradeep K., "Investigation and measurement of porosity in Al + 4.5Cu/6wt%TiB<sub>2</sub> in situ composite: optimization and statistical modelling" **Journal of Materials Research & Technology**, 9, (2020) 8041-8057,
  29. Karloopia, J., Mozammil, S., Jha, P. K., " Influence of In Situ Titanium Diboride Particulate Reinforcement on Mechanical Properties of Aluminum–Silicon Based Metal Matrix Composite", **Journal of Materials Research & Technology**, 72, 2927–2936 (2020) DOI: <https://doi.org/10.1007/S11837-020-04245-X>
  30. Sharma, Varun, Pandey, Pulak M., Dixit, Uday S., Roy, Anish, and Silberschmidt, Vadim V., "Finite element simulations of conventional and ultrasonically assisted turning processes with plane and textured cutting inserts." **Journal of Micromanufacturing**, 3, 1 (2020): 54-68.
  31. Singh, Aswani Kumar, Kumar, Amresh, Sharma, Varun, Kala, Prateek, "Sustainable techniques in grinding: State of the art review." **Journal of Cleaner Production** 269 1(2020): 121876.

32. Reddy, R. Durga Prasad, Sharma, Varun, "Additive manufacturing in drug delivery applications: A review." **International Journal of Pharmaceutics**, 589 (2020): 119820.
33. Singh, Rohit, Sharma, Varun, "Molecular dynamics study of tensile behaviour for cold and linear friction welded single crystal tungsten." **Journal of Molecular Graphics and Modelling** 99 (2020): 107655.
34. Gokhale, Nitish P., Kala, Prateek, Sharma, Varun, Palla, Murali "Effect of deposition orientations on dimensional and mechanical properties of the thin-walled structure fabricated by tungsten inert gas (TIG) welding-based additive manufacturing process." **Journal of Mechanical Science and Technology** 34, 2 (2020): 701-709.
35. Goyal, Rahul, Cervantes, Michel, Gandhi, Bhupendra K., "Synchronized PIV and pressure measurements on a model Francis turbine during start-up", **J. of Hydraulic Research**, 58, (1), (2020), 70–86.
36. Baidar, Binaya, Nicolle, Jonathan, Gandhi, Bhupendra K., Cervantes, Michel J., "Effects of runner change on the Winter-Kennedy flow measurement method - A numerical study", **Renewable Energy**, 153, (2020), pp. 975-984.
37. Baidar, Binaya, Nicolle, Jonathan, Gandhi, Bhupendra K., and Cervantes, Michel J., "Numerical study of the Winter-Kennedy flow measurement method in transient flows", **Energies**, 13, 2020, 1310.
38. More, B.S., Dutta, S., Gandhi, Bhupendra K., "Flow around three side-by-side square cylinders and the effect of the cylinder oscillation", **ASME Journal of Fluids Engineering**, 142 (2), (2020), 021303:1-12.
39. Tarodiya, Rahul, Khullar, S., Gandhi, Bhupendra K., "CFD modeling of multi-sized particulate slurry flow through pipe bend," **Journal of Advance Fluid Mechanics**, 13, (4), (2020)
40. Thapa, R., Sharma, S., Singh, K. M., Gandhi, Bhupendra K., "Numerical investigation of flow field and performance of the Francis turbine of Bhilangana-III hydropower plant", **Journal of Physics: Conference Series**, 1608, (2020), 012010.
41. Sharma, Shubham, Gandhi, Bhupendra K., "Erosion Wear Behavior of Martensitic Stainless Steel Under the Hydro-Abrasive Condition of Hydropower Plants", J. of Materials Engineering and Performance, **Journal of Materials Engineering and Performance**, 29, (2020), 7544–7554.
42. Tarodiya, Rahul, Gandhi, Bhupendra K., "Effect of particle size distribution on performance and particle kinetics in a centrifugal slurry pump handling multi-size particulate slurry", **Advance Powder Technology**, 31, (12), (2020), 4751-4767.
43. Singh, Avtar, Pal, Siladitya, Coupled chemo-mechanical modeling of fracture in polycrystalline cathode for lithium-ion battery; **International Journal of Plasticity**; 127, (2020), 102636
44. Singh, A., Rajan, R., Ganpule, S., "An Experimental Investigation of Impact of Pendulum with the Surrogate Head," International Journal of Advances in Engineering Sciences and Applied Mathematics, 12, (2020), 94-100,
45. Ganpule, S., Sutar, Sunil, Shinde, Kaustatubh, "Biomechanical Analysis of Woodpecker Response During Pecking Using a Two-Dimensional Computational Model," **Frontiers in Bioengineering and Biotechnology**, 8, (2020), 810,
46. Sutar, Sunil, Ganpule, S., "Investigation of Wave Propagation through Head Layers with Focus on Understanding Blast Wave Transmission," **Biomechanics and Modeling in Mechanobiology**, 19 (3), (2020), 875-892,
47. Sharma, Hitesh, Joy Misra, Prakash Singh, Inderdeep "Friction and wear behaviour of epoxy composites reinforced with food waste fillers." **Composites Communications** 22 (2020): 100436.

48. Lila, Manish Kumar, Komal, Ujendra Kumar, Singh, Yashvir, Singh, Inderdeep "Extraction and Characterization of Munja Fibers and Its Potential in the Biocomposites." *Journal of Natural Fibers* (2020): 1-19.
49. Sharma, Hitesh, Singh, Inderdeep, Misra, Joy Prakash, "Effect of particle size on physical, thermal and mechanical behaviour of epoxy composites reinforced with food waste fillers." *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science* (2020): 0954406220958434.
50. Melese, Kassahun Gashu, Inderdeep Singh. "Joining behavior of jute/sisal fibers based epoxy laminates using different joint configurations." *Journal of Natural Fibers* (2020): 1-12.
51. Sharma, Hitesh, Singh, Inderdeep Misra, Joy Prakash "Evaluation of dynamic properties of citrus limetta peel-based epoxy composites." *Materials Today: Proceedings* 27 (2020): 2273-2276.
52. Sarkar, Subrato, Singh, I. V., Mishra, B. K., A thermo-Mechanical Gradient Enhanced Damage Method for Fracture, *Computational Mechanics*, 66, pp. 1399–1426, 2020,
53. Pandey, V. B., Samant, S. S., Singh, I. V., Mishra, B. K., An Improved Methodology based on Continuum Damage Mechanics and Stress Triaxiality to Capture the Constraint Effect during Fatigue Crack Propagation, *International Journal of Fatigue*, 140, Article 105823, 2020.
54. Samant, S. S., Singh, I. V., Singh, R. N., Effect of Thermo-Mechanical Treatment on High Temperature Tensile Properties and Ductile-Brittle Transition Behavior of Modified 9Cr-1Mo Steel, *Metallurgical and Materials Transactions: A*, 51, pp. 3869–3885, 2020.
55. Samant, Sanjay, Pandey, V. B., Singh, I. V., Singh, R. N., Effect of Double Austenitization Treatment on Fatigue Crack Growth and High Cycle Fatigue Behavior of Modified 9Cr-1Mo Steel, *Materials Science and Engineering: A*, 788, Article 139495, 2020.
56. Singh, S. K., Singh, I. V., Analysis of Cracked Functionally Graded Piezoelectric Material using XIGA, *Engineering Fracture Mechanics*, 230, Article 107015, 2020.
57. Yadav, V. K., Gaur, V., Singh, I. V., Effect of Post-weld Heat Treatment on Mechanical Properties and Fatigue Crack Growth Rate in Welded AA-2024, *Materials Science and Engineering: A*, 779, Article 139116, 2020.
58. Kumar, M., Singh, I. V., Numerical Investigation of Creep Crack Growth in Plastically Graded Materials using C(t) and XFEM, *Engineering Fracture Mechanics*, 226, Article 106820, 2020.
59. Pandey, V. B., Singh, I. V., Mishra, B. K., A Stress Triaxiality Based Modified Liu-Murakami Creep Damage Model for Creep Crack Growth Life Prediction in Different Specimens, *International Journal of Fracture*, 221, pp. 101–121, 2020.
60. Sarkar, Subrato, Singh, I. V., Mishra, B. K., Adaptive Mesh Refinement Schemes for the Localizing Gradient Damage Method based on Biquadratic-bilinear Coupled-field Elements, *Engineering Fracture Mechanics*, 223, Article 106790, 2020.
61. Singh, Anil, Sharma, Satish C., "Influence of geometric imperfection of journal on the performance of porous hybrid journal bearing under turbulent condition", *IMEchE Part-J, Journal of Engineering Tribology*, 2020. (doi.org/10.1177/1350650120976427).
62. Tomar, Adesh Kumar, Sharma, Satish C., "A Study of Hole-Entry Grooved Surface Hybrid Spherical Journal Bearing Operating with Electrorheological Lubricant", *ASME Journal of Tribology*, 142.11 (2020).

63. Tomar, Adesh Kumar, Sharma, Satish C., "An investigation into surface texture effect on hole-entry hybrid spherical journal bearing performance", **Tribology International**, 151.11 (2020): 106417.
64. Kumar, Navin, Shukla, Akash, Bansal, Sanjay, Khatri, Chandra B., Thakre, Gannath D., Yadav, Saurabh K., Sharma, Satish C., Harsha, Suraj P., "Thermo-hydrodynamic Simulation Study of Twin-groove Elliptical (two-lobe) Journal Bearing of Steam Turbine with experimental investigations", **IMEchE Part-J, Journal of Engineering Tribology**, (2020).  
(doi.org/10.1177/1350650120973798).
65. Kulkarni, Anup, Dwivedi, D. K., Vasudevan, M., Microstructure and mechanical properties of A-TIG welded AISI 316L SS-Alloy 800 dissimilar metal joint, **Materials Science and Engineering: A**, 790 (2020), 139685
66. Sinhmar, Sunil, Dwivedi, Dheerendra Kumar, Art of friction stir welding to produce weld joint without rotation of shoulder with narrow heat-affected zone and high corrosion resistance, **Science and Technology of Welding and Joining**, 25 (2020) 490-495
67. Singh, Sneha, "Determination of fundamental coupled torsional—radial frequency of single-walled carbon nanotubes", **Journal of Vibration and Control**, Dec. 2020. Doi: 10.1177/1077546320981349
68. Singh, Sneha, Dutt, V., "A reduced form for fundamental transverse modal frequency of carbon nanotubes", **Materials Today Communications**, 25, 101404 (2020). Doi: 10.1016/j.mtcomm.2020.101404
69. Kumar, S., Karunakar, D. B., Effect of shell thickness and firing temperature on properties of modified ceramic shell for precision casting of Al-Si alloys; **International Journal of Precision Technology**, (2020), 118-129. 10.1504/IJPTECH.2020.112044. (2020).
70. Joglekar, D. M., "Analysis of nonlinear frequency mixing in Timoshenko beams with a breathing crack using wavelet spectral finite element method", **Journal of Sound and Vibration**, 488, (2020), 115532.
71. Singh, Simran J., Harsha, S. P., "Thermal Buckling of porous symmetric and non-symmetric sandwich plate with homogenous core and S-FGM face sheets resting on Pasternak Foundation" **International Journal of Mechanics and Materials in Design**, 16, (2020) 707–731.
72. Singh, Simran J., Nataraj, C., Harsha, S. P., " Nonlinear Dynamic Analysis of a Sandwich Plate With S-FGM Face Sheets and Homogeneous Core Subjected to Harmonic Excitation" **Journal of Sandwich Structures and Materials** , 2020 <https://doi.org/10.1177/1099636220904338>
73. Singh, Simran J., Harsha, S. P., "Analysis of Porosity Effect on Free Vibration and Buckling Responses for Sandwich S-FGM Plate Resting on Pasternak Foundation using Galerkin Vlasov's Method" **Thin Walled Structures**, 180, 2020. (Accepted)
74. Patil, A. P., Mishra, B. K., Harsha, S. P., "Vibration Based Modelling of Acoustic Emission of Rolling Element Bearings" **Journal of Sound and Vibration**, 468, 2020.
75. Govindan, R., Saran, V. H., Harsha, S. P., "Low-Frequency Vibration Analysis of Human Body in Semi-Supine Posture Exposed to Vertical Excitation" **European Journal of Mechanics: Part A - Solids**, 80, (2020)103906.
76. Parmar, V., Saran, V. H., Harsha, S. P., "Effect of Unbalanced Rotor on Dynamic Characteristics of Double-Row Self-Aligning Ball Bearing" **European Journal of Mechanics: Part A - Solids**, 82, (2020)104006.
77. Patra, Pravjyoti, Saran, V. H., Harsha, S. P., "Chaotic dynamics of cylindrical roller bearing supported by unbalanced rotor due to localized defects," **Journal of Vibration and Control** 26 21-22, (2020).  
<https://doi.org/10.1177/1077546320912109>

78. Patra, Pravjyoti, Saran, V. H., Harsha, S. P., "Vibration Response Analysis of High-Speed Roller Bearings Using Response Surface Method," **Proceedings of IMECH E, Part K: Journal of Multibody Dynamics**, 234, 2, (2020) 379 – 392.
79. Singh, S. J., and Harsha, S. P., "Nonlinear Vibration Analysis of Sigmoid Functionally Graded Sandwich Plate with Ceramic-FGM-Metal Layers" **Journal of Vibration Engineering & Technology**, 8, 1, (2020) 67 – 84.
80. Parmar, Vivek, Saran, V. H., Harsha, S. P., "Nonlinear vibration response analysis of double-row self-aligning ball bearing due to surface imperfections," **Proceedings of IMECH E, Part K: Journal of Multibody Dynamics**, 234, 3, (2020) 514 – 535.
81. Patel Sachin P., Upadhyay, S. H., "Euclidean distance based feature ranking and subset selection for bearing fault diagnosis", **Expert System system with Applications**, 154, (2020),113400
82. Kumar, S., Upadhyay, S. H., Koryanov, V. V., "A wrinkling analysis and control of rectangular membrane structures with upscale modelling under on-orbit conditions", IOP: **Materials Science and Engineering**, 812 (2020) 012014 doi:10.1088/1757-899X/812/1/012014.
83. Kumar, S., Upadhyay, S. H., Koryanov, V. V., "Research and modeling of wrinkles and control of rectangular membrane structures with high-class modeling in on-orbit conditions", IOP: **Materials Science and Engineering**, 812 (2020) 012011 doi:10.1088/1757-899X/812/1/012011.
84. Tiwari, Prashant, Upadhyay, S. H. "Elucidation of ball bearing performance utilizing product functions of vibration signals and locality sensitive discriminant analysis", **Proc IMechE Part K: J Multi-body Dynamics**, 234(1) (2020) 50–66.
85. Singh, Simran J., Harsha, S. P., "Analysis of Porosity Effect on Free Vibration and Buckling Responses for Sandwich S-FGM Plate Resting on Pasternak Foundation using Galerkin Vlasov's Method" **Journal of Sandwich Structures and Materials** , 23 5 2021 <https://doi.org/10.1177/1099636220904340>
86. Kumar, Vivek, Sharma, Satish C., "Performance analysis of rough surface hybrid thrust bearing with elliptical dimples", **IMechE Part-J, Journal of Engineering Tribology**, 35 6 2021, (doi.org/10.1177/1350650120931981).
87. Kumar, Vivek, Shah, Vatsal kumar, Singh, Simran, Narwat, Kuldeep, Sharma, Satish C., "Rotor-dynamic Performance of Porous Hydrostatic Thrust Bearing Operating Under Magnetic field", **Industrial Lubrication and Tribology**, 73 2 2021, (10.1108/ILT-07-2020-0289).
88. Kumar, Jayant, Kumar, Vipin, Singh, Inderdeep, Rakesh, Pawan Kumar, "Joining behavior of polymeric composites fabricated using agricultural waste as fillers." **Journal of Adhesion Science and Technology** 35 15 (2021) 1652-1663.
89. Kannojiya, V., Das, A. K., Das, P. K., Simulation of blood as fluid: A review from rheological aspects. **IEEE Reviews in Biomedical Engineering** 14 (2021).
90. Silvi L., Chandraker D., Ghosh S., Das A. K., On-route to dryout through sequential interfacial dynamics in annular flow boiling around temperature and heat flux controlled heater rod. **Chemical Engineering Science** 229(16) (2021) 116014.
91. Singh D., Das, A. K., Dynamics of Inner Gas during the Bursting of a Bubble at the Free Surface, **Physics of Fluids** 33(5) (2021).
92. Gangwar, A. S., Agrawal, Y., Joglekar, D. M., "Nonlinear Interactions of Lamb Waves With a Delamination in Composite Laminates", **ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems**, 4(3), (2021), 031008.
93. Kapoor, S., Saxena, D. K., Leeuwen, M. V., Online summarization of dynamic graphs using subjective interestingness for sequential data; **Data Mining and Knowledge Discovery**, 35(1), (2021) 88-126

94. Kumar R., Rohilla L., Das A. K., Understanding Interfacial Behavior During Boiling of Nitrogen from Liquid-liquid Contact Plane, **International Journal of Heat and Mass Transfer** 65 part A (2021).
95. Rohilla L., Das A. K., Modelling Interaction between a Taylor Bubble and Small Bubble in a Rectangular Column, **Physics of Fluids** 32, (2020) 112106.
96. Kannojiya, V., Das, A. K., Das, P. K., Comparative Assessment of Different Versions of Axial and Centrifugal LVADs: A Review, *Artificial Organs*, 45(7) 2021665-681.
97. Silvi, L. D., Chandraker, D., Ghosh, S., Das, A. K., Dynamics of Disturbance Waves in an Adiabatic Coaxial Gas-Liquid Annular Flow, **Multiphase Science and Technology**, 33 (2021) 29-51.
98. Patra P., Saran V.H., Harsha S.P. Crack Detection in Rolling Element Bearings Using the Wavelet Transform. **Advances in Systems Engineering, Lecture Notes in Mechanical Engineering. Springer:** (2021) 213-222.
99. Govindan R., Saran V.H., Harsha S.P. Subjective discomfort analysis of human body in semi-supine posture caused by vertical sinusoidal vibration, **Ergonomics**. 64(6), (2021), 744-754.
100. Sharma, Saurabh S, Parashar, Avinash, Atomistic simulations to study the effect of helium bubble on the crack tip behaviour in single crystal Ni. **Journal of physics D: applied physics**. 54 36 (2021).
101. Singh, Sandeep Kumar, Parashar, Avinash, Defect dynamics and uniaxial tensile deformation of equi and non-equi-atomic configuration of multi elemental alloys. **Materials chemistry and physics**, 266, (2021) 124549.
102. Chaurasia, Ankur, Parashar, Avinash, Effect of grain boundary configuration on the interfacial thermal transport properties of BNNS/PE nanocomposite. **International journal of heat & mass transfer**, 170, (2021) 121039.
103. Singh, Sandeep Kumar, Parashar, Avinash, Atomistic simulations to study crack tip behaviour in multi-elemental alloys. **Engineering fracture mechanics**, 243, (2021) 107536.
104. Chaurasia, Ankur, Mulik, Rahul S, Parashar, Avinash, Polymer based nanocomposites for impact loading: a review. **Mechanics of advanced materials and structures**, <https://doi.org/10.1080/15376494.2021.1871688>, 2021.
105. Sharma, Bharat Bhushan, Parashar, Avinash, Inter-granular fracture behavior in bicrystalline boron nitride nanosheets using atomistic and continuum mechanics based approaches. **Journal of materials science**, 56, (2021) 6235-6250.
106. Sharma, Bharat Bhushan, Parashar, Avinash, Fracture behaviour of pristine and defective form of water submerged h-BN nanosheets. **Journal of physics D: applied physics**, 54, (2021) 035306.
107. Das, Shashikant, Subudhi, Sudhakar, "A review on different methodologies to study thermal comfort". **International Journal of Environmental Science and Technology**. (2021). <https://doi.org/10.1007/s13762-021-03210-8>,
108. Kumar, Deepak, Kumar, Aditya, & Subudhi, Sudhakar, "Effect of spatially varying magnetic field on the cooling of an electronic component through natural convection in magnetic nanofluids". **ASME-J. Therm. Sc. Eng. Appl.**, 13(6) (2021) 061017 doi:10.1115/1.4050233.
109. Kumar, Aditya, Subudhi, Sudhakar, "Experimental investigation on the thermophysical properties of low concentration magnetic colloidal suspensions (nanofluids) with the variations in temperature & magnetic field", **Journal of Magnetism and Magnetic Materials**, 526, (2021) 167723,.
110. Kumar, Deepak, Kumar, Aditya, Subudhi, Sudhakar "Magnetic field effect on the buoyancy-driven convection in Fe<sub>3</sub>O<sub>4</sub>/water nanofluid filled enclosure with mutual orthogonal heaters". **ASME-J. Therm. Sc. Eng. Appl.**, 13, (2021) 041021-1-12,

111. Khurana, Deepak, Subudhi, Sudhakar, "Effects of pH and surfactant on the forced convection of Al<sub>2</sub>O<sub>3</sub>/water and TiO<sub>2</sub>/water". **ASME-J. Therm. Sc. Eng. Appl.**, (2021) DOI:10.1115/1.4049435.
112. Sajesh M, Geleta Fekadu, Singh, Kalpana, Subudhi, Sudhakar, "Liquid desiccant air conditioning using single storage solution tank, evaporative cooling and marquise shaped solar collector". **ASME-J. Energy Res. Tech.**, 143, (2021) 112001-1-12,
113. Dixit, Nitin, Sharma, Varun, Kumar, Pradeep, "Development and characterization of xanthan gum-based abrasive media and performance analysis using abrasive flow machining." **Journal of Manufacturing Processes** 67, (2021) 101-115,.
114. Tiwari, Tanmay, Dvivedi, Akshay, Kumar, Pradeep, "Investigations on the fabrication of a patterned tool by chemical etching." **Materials and Manufacturing Processes**, (2021) 1-13,
115. Kumar, Anish, Mangla, Sachin Kumar, Kumar, Pradeep, Song, Malin, "Mitigate risks in perishable food supply chains: Learning from COVID-19." **Technological Forecasting and Social Change** 166, (2021) 120643,
116. Choudhary, Neha, Kumar, Anish, Sharma, Varun, Kumar, Pradeep, "Barriers in adoption of additive manufacturing in medical sector supply chain", **Journal of Advances in Management Research**, 2021.
117. Yadav, Vineet Kumar, Singh, Ramver, Kumar, Pradeep, Dvivedi, Akshay, "Performance enhancement of rotary tool near-dry EDM process through tool modification." **Journal of the Brazilian Society of Mechanical Sciences and Engineering** 43 (2), (2021) 1-16,
118. Dixit, Nitin, Sharma, Varun, Kumar, Pradeep, "Research trends in abrasive flow machining: A systematic review." **Journal of Manufacturing Processes** 64, (2021) 1434-1461,
119. Shamim, Farhan Ahmad, Dvivedi, Akshay, Kumar, Pradeep, "On near-dry wire ECDCM of Al6063/SiC/10p MMC." **Materials and Manufacturing Processes**, 36 (1), (2021) 122-134,
120. Vats, Anuj, Dvivedi, Akshay, Kumar, Pradeep, "Assessing the performance of STED process for fabricating high aspect ratio holes on Inconel 718 alloy." **Materials and Manufacturing Processes**, 36 (6), (2021) 677-692,.
121. Kumar, Rohit, Mishra, Manish, Gokhale, Onkar, Mukhopadhyay, D., Experimental and Numerical Study of 19-Pin Disassembled Fuel Channel Under Severe Accident Condition **Nuclear Engineering and Design**, 380, (2021) 111278.
122. Aasi, Harpreet Kaur, Mishra, Manish, Experimental Investigation and ANN Modelling on Thermo-hydraulic Efficacy of Cross-flow Three-fluid Plate-fin Heat Exchanger **International Journal of Thermal Sciences**, 164, (2021) 106870.
123. Amanuel, Tarikayehu, Mishra, Manish, Comparative Study of Thermal and Hydraulic Performance of Three-Fluid Tubular Heat Exchanger With CuO–Water Nanofluid: Single-Phase and Multi-Phase Approaches **ASME - Journal of Thermal Science and Engineering Applications**, 13, (2021) 031012-1-10.
124. Sharma, Naveen, Tariq, Andallib, Mishra, Manish, Effect of Permeable Ribs on Thermal-Flow Characteristics in an Internal Cooling Duct **ASME - Journal of Thermal Science and Engineering Applications**, 13, (2021) 011023-1-14.
125. Bhandari, Deepak, Chhibber, Rahul, Sharma, L., Arora, Navneet, and Mehta, Rajeev, 'Combining CaO–SiO<sub>2</sub>–TiO<sub>2</sub> and CaO–SiO<sub>2</sub>–Al<sub>2</sub>O<sub>3</sub> ternary phase systems for design of bimetallic welds', Proceedings of the Institution of Mechanical Engineers, Part B: **Journal of Engineering Manufacture**, 235, (2021) Issue 8, 1271-1283,
126. Kumar, Naveen, Arora, Navneet, 'Effect of solution treatment on slurry erosive wear performance of martensitic and nitrogen strengthened austenitic stainless steel', **Materials Letters**, Volume 284, Part 1, (2021), 1289322020.

127. Tariq, Andallib, Siddappa, P. G., Spot conductance measurement of aluminum alloys at cryo-temperatures under varying pressure conditions, **International Journal of Thermal Sciences, (Elsevier)**, (2021), 107031 20 pages
128. Siddappa P. G., Tariq, Andallib, Low-temperature thermoelectric transport properties of selected metals and dielectrics, **Thermal Science and Engineering Progress, (Elsevier)**, 24, (2021), 100940 13 pages
129. Singh, Ankit R., Tariq, Andallib, Sahoo, P. K., Majumdar, Prasanna, Mukhopadhyay, Deb, Longitudinal deformation study of pressure tube of Indian PHWR under high temperature transient, **Annals of Nuclear Energy, (Elsevier)**, 155, (2021), 108160 8 pages;
130. Tariq, Andallib, Prajapati, Anjana, Heat Transfer Characteristics Within the Matrix Cooling Channels, **Journal of Turbomachinery, (ASME)**, 143, (2021), 051007:1-051007:13
131. Prajapati, Anjana, Tariq, Andallib, Experimental Investigation on Heat Transfer and Friction Factor in Open Matrix Subchannels, **Journal of Heat Transfer, (ASME)**, 143, (2021), 052101:1-052101:12
132. Sharma, Naveen, Tariq, Andallib, Mishra, Manish, Effect of Permeable Ribs on Thermal-Flow Characteristics in an Internal Cooling Duct, **Journal of Thermal Science and Engineering Applications, (ASME)**, 13, (2021), 011023-1, 14 pages 30.
133. Rayankula, Vitalram, Pathak, P. M., Fault Tolerant Control and Reconfiguration of Mobile Manipulator, **Journal of Intelligent & Robotic Systems** (2021) 101:34, <https://doi.org/10.1007/s10846-021-01317-1>.
134. Chawla, Ishan, Pathak, P. M., Notash, Leila, Samantaray, A. K., Li, Qingguo, Sharma, U. K., Effect of Selection Criterion on the Kineto-Static Solution of a Redundant Cable-Driven Parallel Robot Considering Cable Mass and Elasticity, **Mechanism and Machine Theory** 156 (2021) 104175.
135. Singh, Rohit, Sharma, Varun, "Numerical modelling of residual stresses during orthogonal cutting of Ti6Al4V using internally cooled cutting inserts." **Journal of Manufacturing Processes** 65 (2021): 502-511.
136. Sharma, Varun, Shaik, Khaja Moinuddin, Choudhury, Archita, Kumar, Pramod, Kala, Prateek, Sultana, Yasmin, Shukla, Rahul, Kumar, Dalip, "Investigations of process parameters during dissolution studies of drug loaded 3D printed tablets." Proceedings of the Institution of Mechanical Engineers, Part H: **Journal of Engineering in Medicine** 235 5(2021): 0954411921993582.
137. Deepak, Anurag, Kumar, Dinesh, Sharma, Varun, "Developing an effectiveness index for biomedical waste management in Indian states using a composite indicators approach." **Environmental Science and Pollution Research** (2021): 1-16.
138. Sah, Neetesh Kumar, Singh, Ramandeep, Sharma, Varun, "Experimental investigations into thermophysical, wettability and tribological characteristics of ionic liquid based metal cutting fluids." **Journal of Manufacturing Processes** 65 (2021) 190-205.
139. Kumar, Mohit, Sharma, Varun, "Additive manufacturing techniques for the fabrication of tissue engineering scaffolds: A review." **Rapid Prototyping Journal**. 27 6 (2021) 1230-1272.
140. Kumar, Sandeep, Cervantes, Michel J., Gandhi, Bhupendra K., "Rotating vortex rope formation and mitigation in draft tube of hydro turbines – a review from experimental perspective, **Journal of Renewable & Sustainable energy reviews**, 136, (2021).
141. Tarodiya, Rahul, Gandhi, Bhupendra K., "Numerical Investigation of Erosive Wear of a Centrifugal Slurry Pump due to Solid-Liquid Flow", **Journal of Tribology-Transaction ASME**, 143 (10), (2021), pp. 101702-1 to 14.

142. Sharma, Shubham, Gandhi, B. K., Pandey, Liladhar, "Measurement and analysis of sediment erosion of a high head Francis turbine: A field study of Bhilangana-III hydropower plant, India", **Engineering Failure Analysis**, 122, (2021), Article No. 105249.
143. Singh, Avtar, Pal, Siladitya, Strain gradient enhanced chemo-mechanical modeling of fracture in cathode materials for lithium-ion batteries, **International Journal of Solids and Structures**, <https://doi.org/10.1016/j.ijsolstr.2021.111098>, 2021
144. Kumar, Nitish, Pal, Siladitya, Unraveling interactions of resonances for tunable low frequency bandgap in multi-phase metamaterials under applied deformation; **International Journal of Solids and Structures**, 212, (2021), 169-201
145. Singh, Avtar, Pal, Siladitya, Multi-phase field modeling for various fracture mechanisms in composites; *Engineering Fracture Mechanics*, 2021, 241, 107348
146. Sutar, Sunil, Ganpule, S., "Assessment of Compression Driven Shock Tube Designs in Replicating Free-Field Blast Conditions for TBI Studies," **Journal of Neurotrauma**, 38(12), (2021), 1717-1729,
147. Komal, Ujendra Kumar, Lila, Manish Kumar, Singh, Inderdeep, "Processing of PLA/Pineapple Fiber Based Next Generation Composites." **Materials and Manufacturing Processes** (2021), In Press, DOI: 10.1080/10426914.2021.1942904
148. Komal, Ujendra Kumar, Kasaudhan, Bal Kishan, Singh, Inderdeep, "Comparative Performance Analysis of Polylactic Acid Parts Fabricated by 3D Printing and Injection Molding." **Journal of Materials Engineering and Performance** (2021): 1-7.
149. Lila, Manish Kumar, Komal, Ujendra Kumar, Singh, Inderdeep, "Thermal post-processing of bagasse fiber reinforced polypropylene composites." **Composites Communications** 23 (2021): 100546.
150. Singh, Bhupendra Kumar, Komal, Ujendra Kumar, Singh, Yashpal, Banwait, Sukhwant Singh, Singh, Inderdeep, "Development of banana fiber reinforced composites from plastic waste." **Materials Today: Proceedings** 44 (2021): 2194-2198.
151. Singh, Yashpal, Kumar, Jayant, Naik, Tejas Pramod, Pabla, B. S., Singh, Inderdeep "Processing and characterization of pineapple fiber reinforced recycled polyethylene composites." **Materials Today: Proceedings** 44 (2021): 2153-2157.
152. Melese, Kassahun Gashu, Tejas P. Naik, Singh, Inderdeep, "Adhesive joining of sisal/jute/hybrid composites with drilled holes in lap area." *Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications* 235, no. 2 (2021): 255-264.
153. Sarkar, Subrato, Singh, I. V., Mishra, B. K., A Simplified Continuous-Discontinuous Approach for Fracture based on Decoupled Localizing Gradient Damage Method, *Computer Methods in Applied Mechanics and Engineering*, 383, (2021) Article 113893,.
154. Dsouza, S. M., Hirshikesh, Mathew T. V. , Singh, I. V. , Natarajan, S. , A non-intrusive stochastic phase field method for crack propagation in functionally graded materials, **Acta Mechanica**, 232, 2555–2574 (2021).
155. Singh, S. K., Singh, I. V., Extended Isogeometric Analysis for Fracture in Functionally Graded Magneto-Electro-Elastic Material, *Engineering Fracture Mechanics* 247, (2021), Article 107640.
156. Pandey, V. B., Singh, I. V., Mishra, B. K., A Strain-based Continuum Damage Model for Low Cycle Fatigue under Different Strain Ratios, **Engineering Fracture Mechanics**, 242, (2021), Article 107479,
157. Duhan, Neha, Patil, R. U., Mishra, B. K., Singh, I. V., Y.E. Pak, Thermo-Elastic Analysis of Edge Dislocation using Extended Finite Element Method, **International Journal of Mechanical Sciences**, 192, Article 106109, 2021.

158. Agrawal, Nitin, Sharma, Satish C., "Effect of the ER lubricant behaviour on the performance of spherical recessed hydrostatic thrust bearing", in **"Tribology International"**, 153, 2021, 106621.
159. Singh, Anil, Sharma, Satish C., " Analysis of a double layer porous hybrid journal bearing considering the combined influence of wear and non- Newtonian behaviour of lubricant", **Meccanica**, 56(1), 73–98 (2021).
160. Bhamu, Rajesh K., Shukla, Aakash, Sharma, Satish C., Harsha, S. P., "Dynamic Analysis of Low-Pressure Steam Turbine Last Stage Fir-Tree Root Blade." **Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems**, 4, 2 (2021).
161. Sharma, Satish C., Singh, Anil, "Behaviour of Conical Porous Hybrid Journal Bearing with Pseudoplastic Lubricant", **STLE Tribology Transactions**, 64 3, (2021) 413-433, DOI: 10.1080/10402004.2020.1850958.
162. Sharma, Satish C., Kumar, Abhishek, "On the behaviour of roughened conical hybrid journal bearing system operating with MR lubricant. " **Tribology International**" 156, (2021), 106824.
163. Sharma, Satish C., Sahu, Krishnkant, "On the Behavior of Ferrofluid Lubricated Herringbone Grooved Hybrid Slot-entry Bearing", **IMechE Part-J, Journal of Engineering Tribology**, (2021). (doi.org/10.1177/1350650121997241)
164. Guria, Johnson Frank, Bansal, Ankit, Kumar, Vimal, "Effect of additives on the thermal conductivity of zirconium diboride based composites – A review", **Journal of the European Ceramic Society**, 41, (2021), 1-23.
165. Kumar, Rupak, Rohilla, Lokesh, Das, Arup Kumar, "Understanding interfacial behaviour during boiling of nitrogen from liquid-liquid contact plane", **International Journal of Heat and Mass Transfer**, 165 (Part A), (2021), 1206661.
166. Chaudhary A., Tiwari M. K., Gupta A., Kumar S., "Numerical Study on Crude Oil Pool Fire Behavior in an Enclosure", In: Revankar S., Sen S., Sahu D. (eds) **Proceedings of International Conference on Thermofluids. Lecture Notes in Mechanical Engineering. Springer, Singapore.** (2021) 455-464. [https://doi.org/10.1007/978-981-15-7831-1\\_42](https://doi.org/10.1007/978-981-15-7831-1_42)
167. Tiwari M. K., Gupta A., Kumar R., Mishra R.K., Chaudhary A., Sharma P.K., "Experimental Study on Elevated Methanol Pool Fires in a Compartment", In: Revankar S., Sen S., Sahu D. (eds) **Proceedings of International Conference on Thermofluids. Lecture Notes in Mechanical Engineering. Springer, Singapore.** (2021) 473-479, [https://doi.org/10.1007/978-981-15-7831-1\\_44](https://doi.org/10.1007/978-981-15-7831-1_44)
168. Mishra R. K., Dasgotra A., Tiwari M. K., Gupta A., Kumar R., Sharma P. K., "Experimental and Numerical Study of Temperature Distribution on Float Glass Along the Wall", In: Revankar S., Sen S., Sahu D. (eds) **Proceedings of International Conference on Thermofluids. Lecture Notes in Mechanical Engineering. Springer, Singapore.** (2021) 447-453, [https://doi.org/10.1007/978-981-15-7831-1\\_41](https://doi.org/10.1007/978-981-15-7831-1_41)
169. Balsara, Sachin, Jain, Pramod, Anbanandam, Ramesh., "An integrated methodology to overcome barriers to climate change mitigation strategies: a case of the cement industry in India", **Environmental Science and Pollution Research**, 28, (2021), pp. 20451–20475.
170. Khurana, Aman, Kumar, Ajay, Raut, Santosh Kumar, Sharma, Atul Kumar, Joglekar, M. M., "Effect of viscoelasticity on the nonlinear dynamic behavior of dielectric elastomer minimum energy structures", **International Journal of Solids and Structures**, 208-209, (2021), 141-153.
171. Karunakar, D. B., Kumar S., "Characterization and Properties of Ceramic Shells in Investment Casting Process", **International Journal of Metalcasting**, 15, (2021), 98-107.

172. Agrawal, N., Kumar, A., Bajaj, Varun, Singh, G. K., "Design of digital IIR filter: A research survey", **Applied Acoustics**, 172, (2021), 107669.
173. Kumar, A., Sharma, I., Balyan, L. K., "Design of low power multiplierless FIR filter with enhanced adder efficiency using flower pollination optimization", **Applied Acoustics**, 174, (2021), 107792.
174. Kumar, A., Sharma, I., Vishwakarma, S., Balyan, L. K., "A novel technique for common sub-expression elimination for digital FIR filters using hit and miss transform", **Applied Acoustics**, 174, (2021), 107793.
175. Pandey, V. B., Singh, I. V., Mishra, B. K., "Complete Creep Life Prediction Using Continuum Damage Mechanics and XFEM", In: Saha S.K., Mukherjee M. (eds) **Recent Advances in Computational Mechanics and Simulations. Lecture Notes in Mechanical Engineering. Springer, Singapore**, 169-176 (2021) [https://doi.org/10.1007/978-981-15-8315-5\\_15](https://doi.org/10.1007/978-981-15-8315-5_15).
176. Jha, A., Singh, I. V., Mishra, B. K., Singh, R., Singh, R. N., "Numerical Study of Coupled Elasto-Plastic Hydrogen Diffusion at Crack Tip Using XFEM", In: Saha S.K., Mukherjee M. (eds), **Recent Advances in Computational Mechanics and Simulations. Lecture Notes in Mechanical Engineering. Springer, Singapore**. 177-186 (2021), [https://doi.org/10.1007/978-981-15-8315-5\\_16](https://doi.org/10.1007/978-981-15-8315-5_16).
177. Mishra, Saumitra, Vishwakarma, Pushpendra Kumar, Sharma, Ankit, Mishra, Kirti Bhushan, "Experimental investigation of small-scale CS<sub>2</sub> (carbon disulphide) pool fires", **Process Safety and Environmental Protection**, 145, (2021), pp. 203-210.
178. Sujith, S. V., Solanki, Anand Kumar, Mulik, Rahul S., "Experimental Evaluation in Thermal Conductivity Enhancement and Heat Transfer Optimization of Eco-Friendly Al<sub>2</sub>O<sub>3</sub>-Pure Coconut Oil Based Nano Fluids" **J. Thermal Sci. Eng. Appl.**, 13 (3) (2021), 031005 (13 pages)
179. Kumar, Ankit, Malik, Gaurav, Kumar, Ashwani, Chandra, Ramesh, Mulik, Rahul S., "Transformation nanorod to nanotube of highly oriented novel h-BN hierarchical nanostructured arrays synthesized via two-step wet chemical route", **Materials Characterization**, 171, (2021), 110820.
180. Kumar, Ankit, Malik, Gaurav, Goyal, Kushagra, Sardana, Neha, Chandra, Ramesh, Mulik, Rahul S., "Controllable synthesis of tunable aspect ratios novel h-BN nanorods with an enhanced wetting performance for water repellent applications", **Vacuum**, 184, (2021), 109927
181. Kumar, Atul, Pal, Kaushik, Mula, Suhrit, "Effects of cryo-FSP on metallurgical and mechanical properties of stir cast Al7075–SiC nanocomposites", **Journal of Alloys and Compounds**, 852, (2021), 156925.
182. Singh, Avtar, Pal, Siladitya, "Multi-phase field modeling for various fracture mechanisms in composites", **Engineering Fracture Mechanics**, 241, (2021), 107348.
183. Sharma, P., Dwivedi, D. K., Wire-feed assisted A-TIG welding of dissimilar steels, **Archives of Civil and Mechanical Engineering**, 21 (2021), 1-20.
184. Sharma, P., Dwivedi, D. K., Improving the strength-ductility synergy and impact toughness of dissimilar martensitic-austenitic steel joints by A-TIG welding with wire feed, **Materials Letter**, 285, (2021) 129063.
185. Sharma, A., Karunakar, D. B., Effect of SiC and TiC addition on microstructural and mechanical characteristics of microwave sintered ZrB<sub>2</sub> based hybrid composites, **Ceramics International**, (2021) <https://doi.org/10.1016/j.ceramint.2021.06.058>
186. Sharma, A., Karunakar, D. B., Development and characterizations of ZrB<sub>2</sub>–SiC composites sintered through microwave sintering. In: Singari R.M., Mathiyazhagan K., Kumar H. (eds.) **Advances in Manufacturing and Industrial Engineering. Lecture Notes in Mechanical Engineering. Springer, Singapore** (2021). 815-824 [https://doi.org/10.1007/978-981-15-8542-5\\_71](https://doi.org/10.1007/978-981-15-8542-5_71).

187. Khalkho, J. S., Vidyasagar, C.H., Karunakar, D. B., Mechanical properties of AA2014 matrix composites reinforced with TiO<sub>2</sub> particles through multi-step stir casting; Springer Nature Singapore Pte Ltd., 251-261 (2021).
188. Kumar, Pawan, Harsha, S. P., "Vibration response analysis of exponential functionally graded piezoelectric (EFGP) plate subjected to thermo-electro-mechanical load" *Composite Structure*, **267**, (2021)113901, .
189. Patil, A. P., Mishra, B. K., Harsha, S. P., "Raceway defect analysis of rolling element bearing for detecting slip and correlating the force on rolling element with peak acceleration due to impact" *Measurement*, **179**, (2021)109394,.
190. Parmar, V., Saran, V.H., Harsha, S. P., "Effect of dynamic misalignment on the vibration response, trajectory followed and defect-depth achieved by the rolling-elements in a double-row spherical rolling-element bearing" *Mechanism and Machine Theory*, **162**, 104366, 2021.
191. Kumar, V., Singh, S. J., Saran, V. H., Harsha, S. P., "Vibration characteristics of porous FGM plate with variable thickness resting on Pasternak's foundation" *European Journal of Mechanics: Part A - Solids*, **85**, (2021)104124,.
192. Patil, A. P., Mishra, B. K., Harsha, S. P., "A mechanics and signal processing based approach for estimating the size of spall in rolling element bearing" **European Journal of Mechanics: Part A - Solids**, **85**, (2021)104125,.
193. Patil, A. P., Mishra, B. K., Harsha, S. P., "Fault diagnosis of rolling element bearing using autonomous harmonic product spectrum method" *Proceedings of IMECH E, Part K: Journal of Multibody Dynamics*, (2021). <https://doi.org/10.1177/1464419321994986>
194. Kumar, Pawan, Harsha, S. P., "Response analysis of hybrid functionally graded material plate subjected to thermo-electro-mechanical loading" *Proceedings of IMECH E, Part L: Journal of Design, Materials and Applications*, **235**, 4, (2021) 823 – 827.
195. Kumar, V., Singh, S. J., Saran, V. H., and Harsha, S. P., "Exact solution for free vibration analysis of linearly varying thickness FGM plate using Galerkin-Vlasov's method." *Proceedings of IMECH E, Part L: Journal of Design, Materials and Applications*, **235**, 4, (2021) 880 – 897.
196. Bhamu, R., Shukla, A., Sharma, S. C., Harsha, S. P., "Dynamic Analysis of Low-Pressure Steam Turbine Last Stage Fir Tree Root Blade" **ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems (JNDE)**, **4**, (2021) 21001-11.
197. Rathore, M. S., Harsha, S. P., "Prognostic Analysis of High Speed Cylindrical Roller Bearing using Weibull Distribution and KNN" *ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems (JNDE)*, **5** 1 (2021)1-14. <https://doi.org/10.1115/1.4051314>
198. Govindan, R., Saran, V. H., Harsha, S. P., "Biodynamic human body model to assess the injury risk during space capsule landing" **International Journal of Crashworthiness**, (2021). <https://doi.org/10.1080/13588265.2021.1926844>
199. Tiwari Prashant, Upadhyay, S. H., "Novel self-adaptive vibration signal analysis: Concealed component decomposition and its application in bearing fault diagnosis", **Journal of Sound and Vibration**, **502** (2021), 116079.
200. Sharma, H., Upadhyay, S. H., "Folding pattern design and deformation behaviour of origami based conical structures", **Advances in Space Research**, **67** (2021) 2058–2076.
201. Shinde Swapnil, Upadhyay, S. H., "The novel design concept for the tensioning system of an inflatable planar membrane reflector", **Archive of Applied Mechanics**, **91**, 4, (2021) 1233-1246.

202. T Singh, A Dvivedi, A Shanu, P Dixit., "Experimental investigations of energy channelization behavior in ultrasonic assisted electrochemical discharge machining," **Journal of Materials Processing Technology** 293, 117084
203. Tarlochan Singh & Akshay Dvivedi, "Impact of gas film thickness on the performance of RM-ECDM process during machining of glass," **Materials and Manufacturing Processes**, DOI: 10.1080/10426914.2021.1945092
204. Tarlochan Singh & Akshay Dvivedi, "Fabrication of micro holes in Yttria-stabilized zirconia (Y-SZ) by hybrid process of electrochemical discharge machining (ECDM)," **Ceramics International**, Volume 47 (16) (2021), Pages 23677-23681.
205. Botcha Appalanaidu & Akshay Dvivedi (2021) On controlling of gas film shape in electrochemical discharge machining process for fabrication of elliptical holes, **Materials and Manufacturing Processes**, 36:5, 558-571, DOI: 10.1080/10426914.2020.1854464
206. Ranjeet Singh Rathore and Akshay Dvivedi (2020), "Experimental investigations and its dimensional analysis based modeling of the UAECMD process", **International Journal of Advanced Manufacturing Technology**, DOI: 10.1007/s00170-020-06320-8
207. Kumar, S., & Dvivedi, A. (2020). Development of material removal rate model and performance evaluation of ultrasonic turning process. **Materials and Manufacturing Processes**, 35(14), 1598-1611.
208. Kumar, S., Dvivedi, A., Suryavanshi, A., Chaudhary, A. K., & Tewari, M. (2021). Investigations and optimization of rotary tool micro-USM process for fabrication of microchannels. **Materials Today: Proceedings**, 45, 4993-4997.

#### (e) BOOK/ BOOK CHAPTERS EDITED

1. Prakash, Ravi, Salagame, R., Ramu, Palaniappan, Narayanaswamy, Indira, Saxena, Dhish Kumar, "Advances in Multidisciplinary Analysis and Optimization" **Proceedings of the 2nd National Conference on Multidisciplinary Analysis and Optimization; Springer Nature**, 2020.
2. Kumar, Aditya, Subudhi, Sudhakar, "Natural Convection in an Open Cavity Containing Water Based Fe<sub>3</sub>O<sub>4</sub> Magnetic Nanofluids" **Advances in Engineering Research, Nova Publishers**, June 2020.
3. Kumar, Aditya, Subudhi, Sudhakar, "Thermal Characteristics and Convection in Nanofluids" **Springer Nature**, ISBN: 978-981-334-247-7, Jan 2021. DOI: 10.1007/978-981-33-4248-4.
4. Kassahun Gashu Melese, Naik, Tejas Pramod, Rana, Ram Singh, Singh, Inderdeep "Joint Design for Adhesive Joining of Sisal/Epoxy Composite Laminates", **In Advances in Engineering Design pp. 189-198, 2021 Springer, Singapore** (ISBN: 978-981-33-4017-6).
5. Kumar, Pawan, Rakesh, Sharma, Apurbba Kumar, Singh, Inderdeep **Advances in Engineering Design**, Springer Nature, Singapore, 2021 (ISBN: 978-981-33-4017-6).