

School of Technology

Mechanical Engineering Department

R & D

Area of Research	Name of the faculty member(s)	Title of Research Project/Status	Funding Agency (including ORSP)	Amount Rs. (in lacs)
Refrigeration and air conditioning	Dr. Jatin Patel	Design and development of solar assisted hybrid heat pump system for food drying - under development	ISHRAE	0.49
Refrigeration and air conditioning	Dr. Jatin Patel	Design and development of desiccant based humidifier system for atmospheric water recovery unit - under development	ISHRAE	0.825
Refrigeration and air conditioning	Dr. Jatin Patel	Design, Development, and Investigations of Dehumidifier for Air to Water Generator - completed	ORSP	1.05
Solar thermal	Dr. Jatin Patel	Development and investigations on solar dryer integrated with latent thermal storage- completed	ORSP	0.705
Solar energy	Dr. Jatin Patel	Investigation of Potential Induced Degradation in Glass-to-Glass solar modules for PV/T Applications - completed	ORSP	1.75
Solar thermal	Dr. Jatin Patel	Design and development of a medium scale Solar Forced Convection Dryer System and analyzing its feasibility for commercial use - completed	ORSP	1
Additive Manufacturing	Dr. Pavan Kumar G, Dr. Brijesh Tripathi	Design and characterization of metallized additive manufactured polymer based composites parts. (Project Extension requested)	ORSP	0.85

Water Desalination	Rahul Deharkar	Small scale multi effect water desalination system	ORSP	2.5
Biodiesel	Surendra Singh Kachhwaha	Development of sequential process intensification reactors for biodiesel production using catalyst free insitustransesterification	ORSP	2.5
Design Engineering	Mr. Parth Prajapati	Design and Development of Automatic Robotic Bag Feeder	ORSP	1.72
Manufacturing	Mr. Parth Prajapati &Dr. Jay Vora	Study of Sustainable Friction Stir Coating Process on Aerospace and Ship Building	ORSP	1.30
Offshore marine renewable energy	Dr. Garlapati Nagababu, Prof. Surendra Singh Kachhwaha	Assessment of wind and wave energy along Indian coastal region using space based microwave radars	ISRO	16 (2 years)
Analytical Modelling and Experimental Verification of Crack Detection Method in beams using Vibration based Non-Destructive Technique	Dr. Nirav Patel		ORSP, PDPU	1.46
Thermal analysis of cooling based friction assisted solid state technique	Dr. Nirav Patel		ORSP, PDPU	0.47
Ballistic impact response of fiber reinforced composite,	Dr. Nirav Patel		ORSP, PDPU	1.75
Low Cost- Renewable Energy Driven (LC- RED) Water Treatment Solutions Centre	Dr. Anurag Mudgal	<ol style="list-style-type: none"> 1 Providing practical and innovative low cost solutions to address the shortfall of freshwater supply 2 Providing practical and innovative solutions to address industrial waste water treatment 3 Analysing potential of using bacteria pre- treatment of waste water 4 Design and develop novel module including EC, ED, adsorption 	DST	3.71

		<p>and RO</p> <p>5 Analyse the potential of wind-driven RO</p> <p>6 Design and construct advanced prototypes to demonstrate varieties of modules integrating all renewable energy, biological, bacterial and chemical techniques</p>		
<p>Bio-mimetic and phyto-technologies designed for low-cost purification and recycling of water (INDIA-H2O)</p>	<p>Dr. Anurag Mudgal</p>	<ol style="list-style-type: none"> 1. Develop and introduce novel batch-reverse osmosis technology for a 4-fold reduction in specific energy consumption with high, 80%, recovery ratio 2. Develop forward osmosis based on revolutionary biomimetic membrane technology, for use in wastewater recovery applications including hybrid arrangements with reverse osmosis for further reduction in energy consumption, resulting in an order of magnitude overall reduction in SEC. 3. Pilot small-scale (5–50 m³/day) rurally-relevant low-cost systems for brackish groundwater treatment to provide safe drinking water at costs below €0.35/m³ (<30 rupees/m³). 4. Develop phyto-technology solutions for rural domestic wastewater treatment to remove emerging pollutants (e.g. agricultural products), manage rejected brines, and recover energy from the resulting biomass. 5. Develop and demonstrate cost-effective high-efficiency FO/BRO systems with complementary hybrid technologies for industrial desalination, wastewater treatment and recycling with minimum liquid discharge (up to 80% water recovery). 6. Create a Centre of Excellence in water treatment membrane technologies, design operation, piloting, demonstration, training and dissemination in India. 7. Develop and support the evolution of business models to exploit the developed solutions to mutual EU/India economic 	<p>DBT & UROPION UNION</p>	<p>500</p>

		<p>advantage</p> <p>8 Brief and influence policymakers on economic models and governance arrangements for viable adoption of these technologies in India.</p>		
Solar Powered High Recovery Desalination (SPHRD) to provide clean Water	Dr. Anurag Mudgal	The project focus on the development of novel thermal energy based i.e. steam driven RO process for the desalination of brackish/saline water	DST	63
Development of full penetration CuOF to CuOF welding by GTAW for Neutral Beam Accelerator grid base plate to hydraulic piping connection	Dr VISHVESH BADHEKA, PDP/ / Dr Kush Metha, PDP/ / Mr Jaydeep/ Mr Ashish ITER		BRNS	32.5
Development of dissimilar friction welding joint of higher pipe size (bigger than 1 inch pipe) for Al-SS and SS-Cu materials.	Dr Kush Metha, PDP/ / Dr Vishvesh J Badheka, Mr Bharat Doshi, IPR		BRNS	26.59
Development of Aluminium-Stainless Steel transition pipe joints for cryogenic applications using CMT (Cold Metal Transfer) Process.	Dr SushovanBasak, CV Raman College Dr Vishvesh J Badheka, PDP/ / Dr.Manidipto Mukherjee, SRM University Mr Bharat Doshi, IPR		BRNS	16.90
Study of Metallurgical Feasibility of friction stir weld of wing panel to the wind stringer Air craft applications.	Dr Vishvesh J Badheka PDP/ / Dr S Rajesh, Gr Cap, IAF		DRDO	0.04