Office of the Dean (Research and Consultancy)

# S V National Institute of Technology, Surat

## Database of SVNIT Faculty Members: Research Specializations and Expertise

| Department of Mechanical Engineering | | | |
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| **Sr no** | **Name of the faculty member** | **Research Specialization to be displayed on the R&C website.** | **Any specific interesting research problems that the faculty member is working or intends to work upon** |
| 1. | **Dr. R. Venkata Rao** | Advanced engineering optimization techniques and their applications to the problems of design, Manufacturing and thermal engineering, CAD/CAM/FMS/CIMS, Concurrent Engineering, Sustainable Manufacturing, Design of Mechanisms | • Design optimization of thermal systems and devices<br>• Design optimization of mechanical components<br>• Parameters optimization of sustainable manufacturing processes<br>• Application of optimization algorithms to smart manufacturing systems |
| 2. | **Dr. H. K. Raval** | Metal Forming Analysis<br>Metal Cutting<br>Advance Manufacturing Processes<br>Computer Aided Manufacturing & C.I.M. | • Sheet metal forming analysis like deep drawing, plate rolling<br>• Incremental sheet forming.<br>• Forming of Tailor Welded Blank for automobile application<br>• Computer Aided Manufacturing with CNC FANUC programming<br>• Bulk metal forming analysis like forging, rolling etc.<br>• Metal cutting with Advanced Manufacturing processes. |
| 3. | **Dr. D. P. Vakharia** | CAD-CAM<br>Tribology and Machine Design | • Computer Aided Design and Analysis of Machine Elements<br>• Tribological analysis of Bearing elements<br>• Enhancement of fatigue life of bearing elements using theoretical and experimental techniques |
| 4. | **Dr. K. P. Desai** | Cryogenics<br>Manufacturing Science<br>Unconventional Machining Processes | • cryogenics and modern manufacturing processes |
| 5. | **Dr. Jyotirmay Banerjee** | Computational Fluid Flow and Heat Transfer<br>Multiphase Flow and phase change applications<br>Turbomachine | • Recurrence analysis for identification of two-phase flow regimes in industrial pipes<br>• Design and optimization of Latent Heat Storage systems<br>• Development of accurate numerical algorithms for complex multiphase flows<br>• CFD analysis to depict Vortex rope formation in hydro turbomachines<br>• Dispersion of effluents in lakes and oceans using two-phase jets.<br>• Nucleate and flow boiling analysis for cooling of small scale thermal systems. |

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| 6. | **Dr. A. A. Shaikh** | Composite Material<br>CAD/CAE<br>Reverse Engineering | • Development of smart material/shape memory polymer composites<br>- Investigating Shape recovery of Polymer based smart material/smart carbon fibre composite/ Three phase composites with Nano constituents. Material characterization of developed Nano composites<br>• Developing 3D cavities/Microchannel using Laser – Micro Machining<br>- Investigating requirement of Various Raster shapes and Mc process parameters for various shapes to make molds using multi pass concept for industrial applications<br>• Reverse Engineering for shape evaluation for additively build shape memory Polymer<br>- Investigation of surface defects (NDT) of composites and smart material. Development of digital model from physical model.<br>• Mechanics of Composites<br>- Experimentation and computational mechanics for CFRP composite patches and Glass-Kevlar hybrid multilayer thermoplastic thermoset system. Investigation of dynamic impact loading and ballistic tests, damage evaluation for structural and defense.<br>Future Plan:<br>• 3D cavities for customized shapes for developing micro moulds<br>• Hybrid / multi pass by AWJ on composites. |
| 7. | **Dr. Shailendra Kumar** | AI Applications in Sheet Metal Forming<br>Press Tool Design<br>Incremental Forming<br>Non-traditional Machining<br>Computer Aided Process Planning (CAPP)<br>CAD/CAM/CIM<br>Manufacturing Processes | • 3D Printing of Polymeric parts<br>• 3D Printing of Metallic parts<br>• Incremental Sheet Forming<br>• Non-traditional Machining |
| 8. | **Dr. T. N. Desai** | Six Sigma<br>Total Quality Management<br>Industrial Engineering | • Application of TQM Techniques<br>• Application of Six Sigma technique for quality improvement<br>• Application of Lean Sigma technique for productivity improvement |
| 9. | **Dr. B. M. Sutaria** | Tribology<br>Heat Transfer<br>I.C.Engine<br>Thermal Engineering | • Fuel injection strategies, combustion performance and emission characteristics of a diesel engine.<br>• Investigation of Tribological characteristics of I C Engine, pumps and machines.<br>• Failure and Dynamic Analysis of Laminated Composite and Sandwich Structures. |
| 10. | **Dr. A. D. Parekh** | Refrigeration & Air Conditioning<br>Fluid flow & Heat Transfer<br>Turbo machines | • Performance optimization of automobile air conditioning using R1234yf refrigerant as a replacement to R134a<br>• Improvement of heat transfer using anofluid/NanoParticles in Vapour Compression Refrigeration system<br>• Experimental and numerical investigation of Heat transfer coefficient and frictional pressure drop for two phase flow through mini channel<br>• Experimental and Numerical investigation of Vortex tube refrigeration system<br>• Experimental and Numerical investigation of Vortex tube refrigeration system<br>• Experimental and thermodynamics analysis of Cascade refrigeration system |
| 11. | **Mr. M. B. Maisuria** | Thermal Engg.<br>Energy system<br>Heat exchanger | • Nano Fluid and Heat Exchanger |
| 12. | **Mr. D. B. Gohil** | Mechatronics<br>Robotics<br>Advanced Manufacturing Process | • Application of mechatronics / robotics / advanced machining processes in development of new systems or upgradation of existing systems. |

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| 13. | **Dr. D. I. Lalwani** | Machining<br>Optimization<br>Condition Monitoring | • Prediction of Johnson-Cook material model parameters using Oxley theory.<br>• Optimization of mechanical engineering problems.<br>• Fault diagnosis of rotating machinery. |
| 14. | **Dr. (Miss) Jyoti Menghani** | Corrosion Engg. Thin films<br>Physical Metallurgy of Al alloys<br>Tribology | • Development of Corrosion, Erosion and Wear resistant thermal Spray coating<br>• Development of polymer composites for brake pad material<br>• Development of Metal matrix composites by casting technique.<br>• Welding of Ferrous and Nonferrous metals<br>• Friction stir processing<br>FUTURE:<br>• Innovative smart coatings<br>• Surface Characterization of Material |
| 15. | **Dr. Ravi Kant** | Supply Chain Management<br>Sustainable and Green Supply Chain Management<br>Reverse Logistics<br>Lean Six Sigma<br>Knowledge Management<br>Multi Criteria Decision Making Methods | • Reverse logistics for Medical Waste Management Implementation of Circular Supply Chain in Manufacturing Industries<br>• Sustainable Supply Chain Innovation in Manufacturing Industries<br>• Sustainable and Green Supply Chain Management practices in the Small and Medium Scale Enterprises. |
| 16. | **Dr. Beena D. Baloni** | Turbomachiens<br>Jet propulsion<br>Compressible fluid flow | • Subsonic Wind tunnel testing with test section size 600x600 cm 2 upto velocity 12m/s.<br>• Onsite testing of in house developed SV series wind turbine (Design Patent approved) blades for SHAWT.<br>• Development of class 1 C.F. Pump testing facility. |
| 17. | **Dr. Purnanand V. Bhale** | Alternative Fuels<br>I.C. Engines<br>Energy Conservation Management and audit<br>Non-Conventional Energy Systems | • Design and Development of Solar Assisted Heat Pump based PV/T system<br>• Design and Development of Solar Assisted Biogas Reformer Unit<br>• Installation of Scheffler Solar System of 16 Sq Mt for Cryogenics Applications<br>• Engine Testing on Variable Compression Ratio Engine for alternate Fuels for combustion characteristics<br>• Engine Endurance Testing with alternate fuels<br>• Consultation to civic body related Municipal Solid Waste Management sites for Manure and RDF<br>• Consultation for HVAC Systems for Energy Efficiency and Performance Analysis of Cold Storages and Auditoriums, Specific Buildings (Energy & Buildings)<br>• Development of Biodiesel Plants of small to Large Size<br>• Design and Development of Large size Biogas plant for bottling Purpose based on rice husk, maize straw, kitchen waste and agro residues (Environment Section of Civil Dept)<br>• Sewage based Biogas Power Plant (with civil Department)<br>• Energy efficient Cook Stoves<br>• Use of aquatic biomass for material and energy applications<br>• Use of alternate fuels in cook stoves<br>• Material Compatibility of Metals, Non Metals and Elastomers components of Engine System with alternate fuels from long term compatibility point of view<br>• Consultation for use of Refused Derived Fuels Pallets for Coal fired boilers and Cement kilns<br>• Design and Development of Low cost onion storage for farmers with hybrid cooling<br>• Low Cost Solar PV Panels Cleaning Mechanisms<br>• Fire safety audits of Public Transport Utilities<br>• Energy Audits of Industrial Utilities (As a BEE Certified Auditor)<br>• Characterization of all types of solid, liquid and gaseous fuels for engine and furnace applications<br>• Thermoelectric Generators<br>• Technology Transfer for Small size kitchen waste/ Cow Dung based biogas plant for canteen or hostel mess up to 10 Cubic Meter with Modular FRP design for hotels and |

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| | | | educational institutions.<br>• Energy Storage<br>• Consultation for Electric Buses for public Transport<br>• Life Cycle Assessment of Power Plant (Energy System) with cradle to grave approach (With Environment Section of Civil Dept)<br>• Innovative Hot Water Solutions using energy integration and renewable energy for process industry<br>• Consultation for AC and Non AC MIDI Buses for Civic Body<br>• Consultation for Engine Powered Aquatic De-Weeders for Rivers<br>• Consultation for Engineering aspects of Vehicle Mounted Suction<br>• Jetting and Recycle Facility for cleaning chocked Sewer Lines (with Environment Section of Civil Dept)<br>• Steam Lines and Boilers Utilities |
| 18. | **Dr. Hemantkumar B. Mehta** | wo-phase flow and heat transfer<br>Microscale flows Pulsating<br>Heat Pipe and Heat Sink Optimization of Thermal Systems<br>Radiative Heat Transfer<br>Finite Time Thermodynamics | • Development of Cryogenic and Hybrid Pulsating Heat pipe<br>• Loop Heat Pipe based Battery Thermal Management System<br>• Flow boiling in Single Layered and Double Layered MCHS<br>• Development of Thermoacoustic heat engine for hybrid vehicles<br>• Development of Correlations for next generation Hybrid nanofluids |
| 19. | **Dr. Harshit K. Dave** | Additive Manufacturing Professes;<br>3D printing filaments & raw materials;<br>hybrid composites;<br>unconventional machining processes;<br>micro machining processes;<br>modeling & optimization of manufacturing processes | • 3D printing of polymer/metal parts for various applications<br>• Design for Additive Manufacturing<br>• Design and development of AI enabled robots for day to day applications<br>• Application of AI and ML in manufacturing processes |
| 20. | **Dr. R. D. Shah** | Fluid Flow<br>Heat Transfer<br>Numerical Methods | • Upward Swirl Combustor<br>• Inverse Diffusion Flame<br>• Heat Transfer Augmentation<br>• Porous media Combustion |
| 21. | **Dr. A. V. Doshi** | Micro Hydro Turbine<br>Fluid Machines | • Performance verification of radial flow centrifugal pumps<br>• Hydraulic analysis of low specific speed pump as turbine for power generation and energy recovery systems<br>• Micro hydro turbine performance evaluation. |
| 22. | **Dr. Bade Mukund H** | Energy Management & Efficiency<br>Energy Modelling<br>Process Integration<br>Pinch Analysis<br>Fluid Mechanics & Fluid Machines<br>Thermal System Analysis<br>Fuel Cell Technology | • Energy Model-based benchmarking of Stenter Machine used in Textile Dying Houses<br>• Hydrodynamic analysis of Pump as Turbine<br>• Energy Modelling of Building Energy<br>• Energy Analysis of Spray Dryer and Performance Improvement by Energy Recovery |
| 23. | **Dr. Sandeep Soni** | Machine Design<br>Tribology and Bearing Design<br>Hydrodynamic/Hydrostatic Lubrication<br>Finite Element Analysis<br>CAD-CAM<br>Analysis of Steam Turbine<br>Wear of Machine Components | • friction stir welding (FSW) process<br>• Surface composites by Friction stir processing |
| 24. | **Dr. Dinesh Singh** | Decision Making in the manufacturing environment | • Friction Stir Welding (FSW) process<br>• Surface composites by Friction stir processing |
| 25. | **Dr. Manish Rathod** | Heat & Mass Transfer<br>Phase Change Process<br>Heat Exchanger | • Design optimization of thermal systems and devices<br>• Development of PCM slurry as effective HTF<br>• Application of Micro encapsulation of PCM<br>• Synthesis and Characterization of Nanofluid<br>• Synthesis and Characterization of Nano encapsulated PCM used in building, solar, transportation applications |

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| 26. | **Dr. Vivek D. Kalyankar** | Manufacturing Process<br>Optimization Techniques<br>Casting Material Science | • Ni-Based hard facing as an alternative of Co-based Stellite hardfacing for P91 grade steels<br>• Development of high temperature wear resistant NiCrSiBC hardfacing approach with identified buffer layer on P91 steel<br>• Recommendations of suitable buffer layer material for cladding and substrate under consideration<br>• Investigation on creep behavior of engineering materials<br>• Consultation for welding related problems to industrial products<br>• Significance of metallurgical changes developed in the cladded surface deposited by welding process<br>• Dissimilar welding of advanced grade sheet materials for automobile applications<br>• Mechanical and metallurgical characteristics of NiCrBSi overlay surface on 304SS with and without WC reinforcement<br>• Influence of PTAW process parameters and Co-Cr overlay characteristics with SS 316L substrate material<br>• Parameters optimization of welding process for advanced grade steel using advanced optimization techniques<br>• Application of advanced optimization techniques to engineering problems |
| 27. | **Dr. Shailesh N. Pandya** | Manufacturing Technology<br>Tribology | • Wear behavior of stir cast Al metal matrix composites.<br>• Hybrid investment casting process.<br>• Thermal modeling of Wire Arc Additive Manufacturing (WAAM) process.<br>• Design and analysis of tools and fixtures for FSSW process. |
| 28. | **Dr. Vimal Patel** | Machine design and dynamics<br>Fluid machines<br>Refrigeration and air conditioning<br>Metal forming – Tailor welded blanks | • Development of Numerical Model to study thermal analysis of laser irradiated biological tissue phantom<br>• Development of Numerical model to study transport phenomena in open cell foam<br>• Performance evaluation of fire fighter fabric. |
| 29. | **Dr. Vikram Rathod** | Renewable Energy<br>Biogas & its application<br>Gas Engine performance & Emission<br>Turbomachines | • Biogas Upgradation and application<br>• Biogas plant design and development<br>• Horizontal Axis Wind Turbine Design and Analysis<br>• Biomass cook stove<br>• Biomass Gasification and application<br>• Solar Green House Active dryer<br>• Solar Thermal collector<br>• Gas Engine performance and analysis<br>• Gas Turbine compressor design |
| 30. | **Sh. A. B. Makwana** | Heat Exchanger C.F.D. analysis Fuel Cell | • Liquid/gas combustion system<br>• Solid gas flow of granular material<br>• Heat transfer enhancements |
| 31. | **Sh. Anil Mahto** | Robotics<br>Trajectroy Planning<br>Optimization<br>Finite Element Method | • Robotics<br>• Kinematic Analysis of Parallel Manipulators.<br>• Trajectory Planning.<br>• Analysis of Laminated Composite Structures. |
| 32. | **Sh. Nikunj G. Patel** | pressure Vessel Design<br>Conditioning Monitoring<br>Energy Analysis & Bench Marking | • Energy analysis and Benchmarking |
| 33. | **Dr. Vipul M. Patel** | Radiation Transport in Participating Media,<br>Fluid Flow and Heat Transfer in Porous Media,<br>Radiation Therapy, Bio-heat Transfer,<br>Computational Fluid Dynamics | • Development of Numerical Model to study thermal analysis<br>of laser irradiated biological tissue phantom<br>• Development of Numerical model to study transport phenomena in open cell foam<br>• Performance evaluation of fire fighter fabric. |

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| 34. | **Dr. Naresh Yarramsetty** | Heat Transfer,<br>Refrigeration and Air conditioning,<br>Thermodynamics<br>Heat pipes | • Development and investigations of direct liquid fuel cells for<br>portable power applications.<br>• Development of a hybrid heat sink for better thermal management<br>• Enhancement of water desalination through solar still using<br>a heat pipe. |
| 35. | **Dr. Amit Kumar** | Thermodynamics,<br>Solar Thermal Desiccant air conditioning and Adsorption Refrigeration | • Development of solar powered desiccant air conditioning system.<br>• Development of solar powered Adsorption Refrigeration system.<br>• Development of Numerical Model of desiccant wheel.<br>• Development of Water generation system |
| 36. | **Dr. Prabhansu** | Gasification, Heat Transfer, Solar thermal | • Optimization of tracking device for concentrating PV panel<br>• Enhancement in solar powered air conditioners through better heat transfer techniques.<br>• Study of major water pollutants from the Ganga river and the rural vicinity<br>• Design of HVAC systems.<br>• Solar assisted pyrolysis and gasification of sewage sludge |
| 37. | **Dr. Mulay Amrut Shrikant** | Sheet metal forming, CNC technology,<br>Multi criterion decision making,<br>Process optimization, CAD-CAM | • Optimization of electrical process paraters in incremental forming process.<br>• Multistage incremental forming strategy for DC04 and Ti Gr. 2 alloy.<br>• To investigate best CAM strategy for production of quality component this can help to depute Incremental forming technology in industry.<br>• Yield locus generation of cruciform specimen: Simulation and Experimental study |
| 38. | **Dr. Biranchi Narayan Sahoo** | Casting, Metal matrix composite/<br>Nano composite,<br>Lightweight materials, Plasticity and deformation behavior of materials,<br>Microwave Processing, Forming,<br>Machining, Tribology. | • Development of light weight high entropy alloy through casting processing.<br>• Microwave casting of ferrous and non-ferrous materials.<br>• High temperature deformation behavior study of Mg alloys<br>and composites.<br>• Development of ultra-fine/ nano grained materials through<br>rolling process<br>• Micro forming of composite materials. |
| 39. | **Dr. Nikhil A. Baraiya** | Combustion, Thermoacoustics instability,<br>Combustion diagnostics, Alternate fuels,<br>Thermo-fluid dynamics, Heat transfer | • Development of hydrogen-enriched fueled combustor<br>• Development of fuel flexible engines<br>• Development of micro gas turbine combustor for auxiliary power units<br>• Thermo-acoustics instabilities in gas turbine combustors<br>• Combustion diagnostic in engines<br>• Development of supersonic combustors<br>• Non-linear Dynamical systems<br>• Turbulence modelling and flow instabilities<br>• Flow instabilities in turbo machines |
| 40. | **Dr. Rohit Tamrakar** | Rotor Vibrations,Vibration Analysis,FEM,<br>CAD Modelling,Energy Harvesting through Vibration | • Design and Development of micro energy harvester<br>• Energy harvesting through smart fabrics<br>• Dynamic analysis of rotors containing longitudinal cracks |
| 41. | **Dr. Pallvita Yadav** | Manufacturing Processes, Advanced Machining Processes | • Hybrid machining Process<br>• Numerical and Experimental investigations of Electrochemical Discharge Machining Process<br>• Modelling and Optimization of Non-Traditional Machining Process<br>• Polymer Nanocomposites Materials |
| 42. | **Dr. Sumit Khare** | Solid Mechanics, Vibrations,<br>Plates and Shells,<br>Fiber-Reinforced Polymer Composites | • Vibration analysis of plates and shell like structures<br>• Design Simulation and Modeling of mechanical components.<br>• Development of Numerical Model to study CNT based Composites.<br>• Vibration analysis of mechanical components. |

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| 43. | **Dr. Rohan Rahul Pande** | Biomass cookstove, Heat transfer, Thermodynamics, Nanofluids | • Investigations on Gasification of Refused Derived Fuel (RDF).<br>• Numerical and Experimental investigations on combustion characteristics of Refuse Derived Fuel (RDF).<br>• Production of a Potential Fuel Source from Waste.<br>• Design and analysis of natural draft cook stoves.<br>• Computational analysis of combustion systems. |
| 44. | **Dr. Rayasam Srilakshmi** | Fracture mechanics, Finite element analysis<br>Computational Fracture and Damage Mechanics<br>Study of Fatigue behaviour of aircraft panels<br>Dynamic response of damaged panels | • Numerical and Experimental Investigations on damage behavior of stiffened composite panels.<br>• Experimental fatigue behavior of cracked cylindrical rods<br>• Smart materials- study<br>• Dynamic Crack growth analysis of curved panels |
| 45. | **Dr. Neeraj Srivastava** | Solidification processing of light alloys<br>Composites and foams using conventional and non conventional solidification techniques<br>Microstructural and Mechanical Characterizations<br>Mechanical metallurgy | • Development of light alloys and composites for automobiles and aerospace applications.<br>• Development of high strength metal foams and their composites for shock absorbing applications.<br>• Design and development of new lightweight Aluminium alloys for high temperature applications<br>• Metal matrix nanocomposites<br>• Light weight entropy alloys<br>• Biomaterials |
| 46. | **Dr. Rajesh Chaoudhary** | Heat transfer in nanofluids<br>Ventilation systems in the buildings<br>Refrigeration and Air – Conditioning Systems<br>Computational Fluids Dynamics<br>Plastic and Biomedical waste management | • Hybrid nanofluids: Characterization and stability analysis of hybrid nanofluids, heat transfer enhancement using the hybrid nanofluids in the industrial applications<br>• Temperature-controlled air-flow ventilation system to prevent infection in the buildings<br>• Design and development of a hybrid Biomedical waste treatment system<br>• Computational modeling of fluid flow and heat transfer in a Battery Thermal Management System. |
| 47. | **Dr. Krishna Kishore Mugada** | Friction stir welding and processing<br>Dissimilar metals joining<br>Resistance spot welding<br>Cold Metal Transfer<br>Hybrid welding and joining<br>Microstructure and materials processing<br>Wire arc additive Manufacturing | • Wire arc additive manufacturing of Inconel and Titanium alloys.<br>• Dissimilar Al-Ti welds using solid state joining process.<br>• Mathematical modeling of friction stir welding process.<br>• Numerical simulation of GMAW process.<br>• Machine learning in resistance welding process.<br>• AI/ML in fusion and solid state welding processes. |
| 48. | **Dr. Amit Kumar** | Mechanical Metallurgy,<br>Processing - texture relationship,<br>Deformation and thermo-mechanical processing, Microstructure-mechanical property correlation,<br>Welding of Metals and Alloys | • Bulk metal forming analysis like forging, rolling etc.<br>• Incremental sheet forming of two phase alloys<br>• Welding analysis of metals and alloys<br>• Design and development of ultra-fine/ nano grained materials through rolling process<br>• Microstructure and Texture evolution during deformation based manufacturing processes.<br>• Prediction of deformation texture using crystal plasticity models<br>• Recrystallization behavior of materials |
| 49. | **Dr. Ram Singar Yadav** | Advanced Machining Processes<br>Unconventional Machining<br><br>Hybrid Machining<br>Conventional Machining Processes<br>Advanced Engineering Materials | • Hybrid Grinding: Development and Experimental Investigations.<br>• Hybrid Finishing: Development and Experimental Investigations.<br>• Development of Intelligent Machining System and Experimental Investigations |

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| 50. | **Dr. Sunil Kumar** | Plasticity<br>Metal Forming<br>Severe Plastic Deformation<br>Mechanics of Materials | • Conventional and advanced sheet metal forming processes<br>- Deep drawing, incremental forming, micro forming, Tailored blanks<br>• Severe plastic deformation (SPD) processes<br>- Hybrid SPD processes (CGP followed by cold rolling, ECAP followed by cold rolling)<br>• Plasticity<br>- Advanced anisotropic yield criteria, constitutive modelling using dislocation density, Bauschinger effect<br>• Lightweight materials for automotive applications<br>- Aluminum alloys, magnesium alloys, metal matrix composites |
| 51. | **Dr. Susanta Behera** | Composites<br>Smart Materials and Structures<br>Analytical and Numerical Methods | • Performance evaluation of Polymer Composite Gear<br>• Smart hybrid plate Analysis (Static and Dynamic)<br>• Modelling, Simulation and Analysis of smart structures<br>• Artificial prosthetic design and Analysis |
| 52. | **Dr. Yogendra Kuwar** | Thermal and heat transfer<br>refrigeration and air conditioning<br>Cryogenics. | • Design and analysis of automotive air conditioning for low GWP refrigerants.<br>• Design and analysis of refrigerator and air conditioning system for low GWP refrigerants.<br>• Study of various mixtures of refrigerants for vapor compression system.<br>• Thermodynamic analysis of Claude refrigeration system for low temperature application.<br>• Design and analysis of crycoolers: Stirling and GM types<br>• Cryogenics method for CO 2 separation from various<br>• mixtures.<br>• Design and analysis Cryogenic heat pipe.<br>• Non-conventional refrigeration: Magnetic refrigeration, Vortex flow refrigeration, thermoelectric refrigeration system.<br>• Heat transfer in two phase flow.<br>• Heat transfer in compact heat exchangers.<br>• Waste material utilization for solar concentrator collector for food application. |