Faculty Mapping with Bank of Thrust Areas of the Research

Identified Thrust Area	Sub Area	Faculty Name
Thermal & Fluid Sciences	1. Heat Transfer – Conduction, Convection, Radiation & Phase Change, Microscale/Nanoscale Heat Transfer 2. Cooling Technologies - Role of Nano particles 3. Thermodynamics – Advanced Cycles, Exergy Analysis, Energy Conversion Systems 4. Fluid Mechanics – CFD (Computational Fluid Dynamics), Turbulence Modelling, Multiphase Flows, Micro/Nano-fluidics 5. IC Engines & Combustion – Advanced Fuels (Biofuels, Hydrogen, e-fuels), emission reduction, HCCI Engines. 6. Refrigeration & Air Conditioning – Green Refrigerants, Vapour Compression / Absorption Systems, Cryogenics 7. Renewable & Sustainable Energy – Solar, Thermal, Wind Energy, Hydro, Geothermal, Hydrogen Fuel Cells.	Prof. Sagar S. Kanjiya Prof. Bhavin J. Vegada Prof. Mukesh V. Vekaria Prof. Divyesh R. Dudhatra Prof. Sagar N. Joshi Prof. Jinesh G. Tank
Manufacturing & Production Engineering	1. Advanced Manufacturing Processes – CNC, Non-Traditional Machining (EDM, ECM, Laser, Plasma, Additive Manufacturing) 2. Industry 4.0 & Smart Manufacturing – IoT, AI, Machine Learning, Robotics in Production Systems 3. Materials Processing – Casting, Forming, Welding, Powder Metallurgy, Heat Treatment 4. Additive Manufacturing (3D Printing) – Metals, Polymers, Composites, Biomedical Implants, Rapid Prototyping 5. Lean Manufacturing & Six Sigma – Productivity Improvement, Waste Reduction, Quality Control 6. Nano-Manufacturing & Micro-Fabrication – MEMS/NEMS Devices, Micro-Machining, Nano-Finishing Techniques 7. Sustainable/Green Manufacturing – Energy-Efficient and Environmentally Friendly Processes	Prof. Paras G. Vegada Prof. Hardik H. Kava Prof. Ashutosh M. Joshi Prof. Ankur N. Tank
Design, Solid Mechanics & Materials	1. Solid Mechanics & Strength of Materials – Stress Analysis, Fatigue, Fracture, Creep, Composite Behavior 2. Machine Design & CAD/CAE – Optimization, Lightweight Design, Finite Element Analysis (FEA) 3. Tribology & Surface Engineering – Wear, Lubrication, Coatings, Nano-Tribology 4. Advanced Materials – Composites, Smart Materials, Shape-Memory Alloys, Nano-materials, Biomaterials, Vibration & Acoustics – Structural Dynamics, Noise Control, Damping Materials	Dr. Jignasa P. Mehta Prof. Paresh U. Bhuva Prof. Ankur N. Tank Prof. Dharmesh R. Tanti Prof. Vineet M. Bhatt Prof. Vimal G. Limbasiya

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Research Thrust Area

Faculty of Engineering - Mechanical Engineering

Identified Thrust Area	Sub Area	Faculty Name
Robotics, Automation & Mechatronics	1. Robotics – Industrial Robots, Service Robots, Humanoids, Autonomous Systems 2. Mechatronics – Integration of Mechanical, Electrical, and Control Systems 3. Control Systems & Dynamics – Adaptive Control, Intelligent Control, Nonlinear System Dynamics, Sensors & Actuators – Smart Sensing technologies, MEMS, IoT-Enabled Devices 4. Automation & Artificial Intelligence – Smart Factories, Machine Learning for Predictive Maintenance 5. Unmanned Systems – UAVs, AGVs, Autonomous Underwater Vehicles	Dr. Jignasa P. Mehta Prof. Ankur N. Tank, Prof. Sagar S. Kanjiya, Prof. Paras G. Vegada Prof. Ashutosh M. Joshi Prof. Paresh U. Bhuva Prof. Divyesh R. Dudhatra Prof. Dharmesh R. Tanti
Energy & Environmental Engineering	1. Conventional Power Plants – Gas turbines, Steam Turbines, Nuclear Energy Systems 2. Renewable & Hybrid Energy Systems – Wind-Solar hybrid, Bioenergy, Tidal and Wave Energy 3. Energy Storage – Thermal Storage, Batteries, Super Capacitors, Hydrogen Storage 4. Environmental Sustainability – Pollution Control, Waste Heat Recovery, Carbon Capture 5. Energy Efficiency & Management – Green Building Systems, HVAC Optimization	Prof. Mukesh V. Vekaria Prof. Jinesh G. Tank Prof. Divyesh R. Dudhatra Prof. Sagar S. Kanjiya Prof. Bhavin J. Vegada Prof. Hardik H. Kava
Industrial & Systems Engineering	1. Operations Research & Optimization – Supply Chain, Logistics, Production Planning 2. Industrial Automation – PLCs, SCADA, Digital Twin Systems 3. Human Factors & Ergonomics – Safety Engineering, Human-Machine Interaction, 4. Maintenance & Reliability Engineering – Condition Monitoring, Predictive Maintenance 5. Smart Manufacturing Systems – Cyber-Physical Systems, AI-driven Optimization	Prof. Sagar Joshi Prof. Mukesh V. Vekaria Prof. Ankur N. Tank. Prof. Sagar S. Kanjiya, Prof. Paras G. Vegada
Advanced & Emerging Areas	1. Biomechanics & Biomedical Engineering – Prosthetics, Implants, Tissue Engineering, Biomechanics of Movement 2. Nanotechnology in Mechanical Systems – Nano-Lubricants, Nano-Fluids, Nano-Composites 3. Smart Materials & Structures – Piezoelectric, Magnetostrictive, Self-Healing Materials, Micro & Nano Electromechanical Systems (MEMS/NEMS) – Micro-sensors, Actuators, Lab-On-Chip Devices 4. Artificial Intelligence & Machine Learning in Mechanical Engineering – Predictive Maintenance, Design Optimization, process Automation	Prof. Mukesh V. Vekaria Prof. Jinesh G. Tank Prof. Paresh U. Bhuva Prof. Paras G. Vegada Prof. Ashutosh M. Joshi Prof. Hardik H. Kava

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	5. Sustainable & Green Technologies – Circular Economy, Life Cycle Assessment (LCA), Eco-Design	

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Dean - Faculty of Engineering
HoD – Mechanical Engineering