DEPARTMENT OF CHEMICAL ENGINEERING

Department of Chemical Engineering			
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. Z. V. P. Murthy	Wastewater Treatment Separation Processes (membrane separations, Adsorption, Electrocoagulation etc.) Nanoscience/Nanotechnology	• Membrane distillation; membrane distillation-crystallization; membrane bioreactor; pervaporation separation
2.	Dr. P. A. Parikh	Catalysis in Refining and Petrochemical Processes Fuels Biofuels Decarbonisation Technology, Hydrogen Storage and Transportation, Ammonia as a Fuel, Ammonia Decomposition	• Obtaining important and value-added blending compounds for diesel and gasoline, lower alcohol and olefin oligomerization, olefin homologation • Remediation and sustainable catalyst. • Photocatalytic degradation of wastewater.
3.	Dr. M.Chakraborty	Green Chemistry (Ionic Liquid, Microwave synthesis) Separation Processes (Emulsion liquid membrane, Supported liquid membrane etc) Nanomaterials (Synthesis and application)	• Synthesis of biofuels and biofuels additive from lignocellulosic compounds. • Separation of Endocrine disrupting compounds from wastewater using • hollow fibre supported liquid membrane technique • Application of Nanofluid for different applications like drug delivery, heat transfer etc.
4.	Dr. Mausumi Mukhopadhyay	Nanomaterials/Nanocomposite Biomass to chemicals Separation/Waste water treatment	• Nanocomposite (SnO 2 , RuO 2 and TiO 2) based electrode for supercapacitor (Energy Storage) · Nanocomposite (SeNPs based) as Reactive oxygen species • (ROS) Sensor (electrochemical). · Nanocomposite (CeO 2 and FeO based) as Desalination • Membrane. · Nanocomposite (TiO 2, CeO 2 and ZnO) based as Antifouling • Membrane. · Nanocomposite (CeO 2 based) as Industrial Coating · Biosynthesis of nanoparticles (using plants and • microorganism resources) metal nanoparticles such as Tin oxide (SnO 2), Cerium oxide (CeO 2), Gold, Silver, Platinum, Palladium, Selenium, Cadmium oxide (CdO), and Zinc Oxide (ZnO) and Iron oxide (FeO) reported for production of

			valuable chemicals by catalytic conversion and membrane separation. · Remediation and sustainable catalyst. · Photocatalytic degradation of wastewater.
5.	Dr. Jigisha Kamal Parikh	Energy & Environment Energy Conservation and Efficiency Upgradation Waste to Energy Process Design & Evaluation Environment Audit Environmanagement System Colloidal Science & Surface Engineering	• Biomass carbohydrates to value added chemicals and fuel components through chemo-catalytic route • Design and development of catalytic system/process for a given molecule • Waste valorization through Integrated biorefinery approach (Lab to Pilot Scale) • Design and development of a pilot plant process including scale up studies • Techno-economic evaluation of various processes and plants • Design of controlled drug delivery system including drug-eluting devices mechanism and drug release kinetics • Encapsulation of typical bioactive components • Process development for selective extraction/separation of bioactive components from natural resources • Application of Process intensified approach towards establishment of a typical process • Agriculture and food processing (Biobased materials and technology development) • Design and evaluation of wastewater treatment strategies
6.	Dr. Chetan M. Patel	Nanoparticles production (Wet Nanomilling) Modeling & Simulation of Particulate Systems Particle Technology (Powder/Particle Size, Shape & flow-ability Characterization, Shape analysis using Image processing, Powder compaction)	• Production of nano minerals, nano biomaterials on large scale. • Preparation of Nanostructured materials for Lithium ion batteries and supercapacitor. • Curcumin Nanoparticles / nanogel for drug delivery. • DEM simulation for Pharmaceutical powder filling process.
7.	Dr. Meghal A. Desai	Natural Products Extraction Hydrotropic Separation	• Application of Design of Experiments for optimization of various parameters in a Process • Extraction of valuable chemicals like essential oil, phenolic extracts, pectin from various biomass • Use of sonication and microwave radiation for improving the existing process • Apart from above, facilities like microwave and ultrasound enabled vessel, HPLC, GC, etc. can be utilized for solving a problem upon collboration.
8.	Dr. Arun Kumar Jana	CFD Based Modelling and Simulation Liquid-liquid and gas-liquid multiphase flows Drag Reduction in Pipeline	• CFD Based Modelling and Simulation, Liquid-liquid and gas-liquid multiphase flows, Drag Reduction in Pipeline Transportation, Heterogeneous catalysis in Petroleum Refining and Petrochemicals, Packed and Expanded Bed Operations

		Transportation Heterogeneous catalysis in Petroleum Refining and Petrochemicals Packed and Expanded Bed Operations	
9.	Dr. Jignasa V. Gohel	Advanced thin film Solar cells Nanomaterials/Nanocomposite Nanocatalytic degradation	• New generation photovoltaic solar cells with high efficiency and low cost • Synthesis and characterization of novel nanomaterials and thin films • Investigation on stability, efficiency and degradation studies of hybrid solar cells • Investigation on novel materials for Energy Storage • Ab initio study of photoelectrochemical applications
10.	Dr. (Mrs.) Alka A. Mungray	Membrane separation process, Wastewater treatment, Forward Osmosis (FO), Osmotic Microbial fuel cell (OMFC), Seawater Desalination, Polymer and earthen membrane preparation, Urine treatment, Hydrogel preparation, Polymer blend and nanocomposite, Bio-polymer.	• Fabrication and testing of various different variety of Polymer and earthen membranes; Development of effective draw agents for forward osmosis process, Modification of Osmotic microbial fuel cell for water, bio-electricity and wastewater treatment, Stacking of OMFCs, Development and application of hydrogels for water production and agriculture, Seawater desalination via forward osmosis, Astronaut's Urine converted to water and fertilizer for long Space mission for ISRO.
11.	Dr. A. K. Mungray	Wastewater Treatment (biological treatment); Sludge treatment; Aerobic, Anaerobic processes; Waste to Energy; Nanotechnology; Decentralization; Sustainability	• Testing of water and wastewater samples; Decentralized wastewater treatment; Bioelectrochemical Fuel Cells and their variants; Electricity generation from wastewater by using Microbial Fuel Cells; Electricity generation in the deep sea sediments; Water and fertilizer recovery from human urine for Sustainable buildings, Biomass to valuable products; Recovery of water and fertilizer from Astronaut's Urine for Space research for ISRO.
12.	Dr. Sanjay R. Patel	Ultrasound Assisted Separations Conventional Separations Polymer Processing	• Ultrasound combined with micro-milli channel assisted Crystallization/precipitation, Microfluidics, Nano medicine, Drug Delivery systems, Process intensification using microreactors, ultrasound, and membrane. • Quality by Design in Pharmaceutics, Optimization of Processes using Design of experiments. • Waste water treatment, Modelling and Simulation
13.	Dr. V. N. Lad	Colloidal & Interfacial Engineering Process Intensification & Process Design Rheology of Complex Fluids Microfluidics Thin Film Multiphase Systems Nanotechnology Advanced Materials	• Development of waterproof surfaces • Surface modification of textile • Lab-on-a-Chip devices design and applications for biomedical • requirement • Soft materials and their improved flow properties for food, • pharmaceutical and cosmetic applications • Development of Multifunctional Nanomaterials for selected • applications • Chemical process design for energy efficient and environment-

			• friendly production • Development of Micro-sensors
14.	Dr. Smita Gupta	Membrane separation techniques, Wastewater Treatment, Biochemical Engineering	• Organic-Organic separation by application of liquid membranes in pervaporation • Microbial Enhanced Oil Recovery
15.	Dr. G. C. Jadeja	Neoteric Green Extraction Techniques (Sub/Supercritical and Pressurized Fluid Extractions Valuable Chemicals from Renewable Resources (Bio-refinery Concepts)	• Recovery of high value chemicals from Biomass (particularly fruit and vegetable wastes) employing neoteric solvents
16.	Dr. S.K. Sundar	Drug delivery systems (Extraction/Encapsulation of bioactive compounds) Microfluidics and Nanotechnology Colloids and Interfaces / Surfactants / Rheology Modelling and Simulation Biochemical Engineering (Fermentation/Enzyme Technology) Energy/Environment	• Development of drug delivery systems for pharma, food and cosmetic applications. • Pickering emulsions for food applications. • Green synthesis of nanoparticles/nanocomposites. • Wastewater treatment
17.	Dr. Jogender Singh	Process Intensification,Heat Transfer and Fluid flow, Microfluidics,Micro-flow ExtractionProcesses, Separation Processes,CFD, Modelling and Simulation, Industrial Safety and Hazards Management	• Microfluidic devices. • Microflow extraction of precious metal from waste streams via process intensification. • Process intensification for enhanced efficiency of the cyclone separator. • Renewable energy technologies. • Process modeling and simulation: Modelling and simulation of the solar pond.
18.	Dr. Sarita Kalla	Membrane Separation Process and Membrane Fabrication, Process Modeling and Simulation, Desalination and Waste Water Treatment, Process Optimization, Adsorption	• Membrane Distillation • Membrane fabrication for different membrane separation processes • Membrane Gas Separation • Wastewater treatment • Microbial Fuel Cells • Grey Water Treatment
19.	Dr. Vineet Kumar Rathore	Contaminated Groundwater Treatment, Nanotechnology, Electrochemical Processes, Solid Waste Management, LCA and Sustainability Studies	• Synthesis of nanoparticles through various types of processes and their application for the treatment of water contaminated with dyes, heavy metals and other metalloids; Management of waste generated post water treatment process and environmental assessment of the entire process to make it sustainable.
20.	Dr. Parag Pralhad Thakur	Nanotechnology, Nanofluidics, microfluidics, nanocomposites	• Enhancement of Heat transfer in solar panels, Car radiators, Boiling Processes using Nanofluids • Enhancement of Mass Transfer in CO2 absorption processes using Nanofluids

DEPARTMENT OF CHEMISTRY

Department of Chemistry			
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. Smita Jauhari	Corrosion Polymers and Wastewater treatment	• Synthesis of Heterocyclic scaffolds and their biological evaluation. • Synthesis of Heterocyclic compounds and their evaluation as a corrosion inhibitors
2.	Dr. Kalpana Maheria	Synthesis of materials Ion-exchange Waste water treatment and Catalysis	• Design, preparation, characterization and applications of inorganic and hybrid materials (zeolite / mesozeolites based catalysts and ion exchangers and TMA salts based catalysts and ion exchangers) for organic synthesis (via MCRs), synthetic fuels, biomass valorization and waste water treatment (for heavy, toxic and precious metals' removal, color removal and pharmaceutical waste removal)
3.	Dr. Premlata Kumari	Organic Synthetic chemistry; Natural product extraction; Wastewater treatment	• Designing and synthesis of reaction intermediates and bioactive compounds against various diseases like tuberculosis, cancer, bacterial infections, fungal infections, etc. Extraction of natural products from various medicinally important plants; development of HPLC methods for chemical markers of medicinal plants. Biogenic synthesis of nanoparticles using plant extracts and their applications such as biological property, dye discoloration, antibiotic removal, and metal detection.
4.	Dr. Naved Malek I.	Synthesis and Physical Properties of Polymers	• Development of stimulii-responsive Ionogel (ionic Liquid-based hydrogel) for smart drug delivery
5.	Dr. Bharatkumar Dholakiya	Polyester resin for specialty applications Biofuels-Ultra efficient biodiesel manufacturing	• Development of polymeric cement from PET waste for construction application.
6.	Dr. Suban K. Sahoo	Inorganic Supramolecular Chemistry and Molecular Modeling	• Exploring new chemistry (mainly recognition, sensing and biosensing applications) with vitamin B6 cofactors by adopting nano and supramolecular concepts.
7.	Dr. Suresh Kumar	Miniaturized Extraction Techniques and Capillary Electrophoresis, Functional Nanomaterials,MALDI- and ESI- Mass Spectrometry, Plasmonic and Fluorescent Nanosensors,Biosensing, Bioimaging and Drug Delivery,Green and Environmental Chemistry,	• Synthesis of functional nanomaterials for analytical method development: Miniaturization and visual readouts. • Biocompatible materials for drug delivery and biomedical applications.

8.	**Dr. Ketan C. Kuperkar**	Surfactant Science, Polymer Chemistry, Metal Corrosion, Waste water treatment, Materials Science, Soft Condensed Matter Computational Chemistry	• Exploring the solution behavior and micellization phenomenon using Surfactants and Polymers for evaluating their biological applications.
9.	**Dr. Ritambhara Jangir**	Materials Synthesis and Applications Catalysis	• Fabrication of COF-membranes for various purposes.
10.	**Dr. Togati Naveen**	Metal Catalyzed C-H Functionalization Using Transient Directing Groups Heterocycles Synthesis via C-H Functionalization Metal Catalyzed Functionalization of Unactivated sp3 C-H Bonds Photoredox Catalysis Hypervalent Iodine Chemistry Metal free C-H Functionalization	• Late stage functionalization of drug molecules via visible-light photo redox catalysis.
11.	**Dr. Lata Rana**	Coordination chemistry, Synthetic inorganic chemistry, Catalysis (homogeneous and heterogeneous), and Bioinorganic chemistry.	• Synthesis of immobilized compounds, functionalized graphene oxide, and magnetic nanoparticles for functional mimicking activity, dye degradation, and catalysis.
12.	**Dr. A Sivaiah**	Organic synthesis, Inorganic Supramolecular chemistry, Nano/Bio sensors & Biomaterial applications	• Synthesis of fluorescent supramolecular Inorganic/organic frameworks for recognition of biomolecules in biological systems to provide diagnosis for the disease.
13.	**Dr. Subrata Dutta**	Organic synthesis, Bio-organic and medicinal chemistry. Nucleic acid chemistry.	• Synthesis of NIR dye for biomedical applications. • DNA and peptide-based catalysis. • Design and synthesis of small molecule drugs for Alzheimer's and Parkinson's diseases. • Point - of - Care detection of viral RNA, antibody, and antigen.
14.	**Dr. Arup Kumar Ghosh**	Environmental Chemistry Computational Chemistry Instrumentation Spectroscopic Analysis Atmospheric Chemistry	• Photodissociation and photofragmentation studies of atmospheric pollutants. • Design and development of gas/vapour sensitive materials (with varied morphological shapes for effective degradation and sensing of atmospheric pollutants. • Investigation of reaction kinetics of volatile organic compounds with catalysts/sensors. • Instrument Development for chemical analysis using spectroscopic and mass spectrometric methods. • Electronic structure and energy calculations of molecules, clusters, and ions.

DEPARTMENT OF CIVIL ENGINEERING

Department of Civil Engineering			
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. G. J. Joshi**	Urban Transportation Planning Traffic Flow Modeling Public Transport Planning Regional Planning	• Development of strategies for sustainable urban transportation systems. • Development of framework for evaluating sustainability of urban transportation system. • Efficacy of road safety engineering measures. • Effectiveness of road signs to convey desired information to road users in rural areas User perception - compliance based study. • How to enhance riderships for operating mass transit systems in cities? • Comprehensive evaluation of transit accessibility and level of service. • Traffic flow state assessment based on travel time variability based congestion measure. • Efficacy of intersection improvement strategies with respect to traffic facility operation.
2.	**Dr. C. D. Modhera**	1.Structural dynamics and Earthquake engineering. 2. Health monitoring of structural concrete. 3. Special concrete and relevant applications to the field. 4. Proof checking of structural design and drawings for various civil infrastructures. 5. Design of concrete mixes for various structures and rigid pavements.	• Proof checking of structural design and drawings for various civil infrastructures. • Condition assessment of various RCC and steel existing structures. • Design of concrete mix of rigid pavement and various civil concrete structures. • Third party inspection of various civil projects. • Corrosion assessment and remedial measures of RCC existing structures. • Development of new concrete mix with supplementary cementitious materials. • Development of Geo polymer concrete for high strength concrete mix. Behavior of high strength concrete mix. • Design and vetting of special RCC structures.
3.	**Dr. J. N. Patel**	Water Resources Engineering Geo-spatial Technologies Computational Techniques	• Groundwater Management using Transdisciplinary Approach · Rainwater Harvesting and Groundwater Recharge · Optimized storm water management with water saving · Economical design of Storm Water Drainage System

			· Flood Management and River Training · Irrigation Water Management using IoT · Agriculture Water Management using Hydrogel · Conjunctive use of Surface water and Groundwater · Solving Water Resources Engineering problems using Geospatial Technologies · Optimization of water resources engineering problems using Soft Computing Techniques · Reservoir Operating Policy · Design of canal lining and its economics · Design of Hydraulic Structures · Water Saving with Economical Solutions · Reclamation of Saline Soil · Flood Plain Management · Plan for using Solar Energy and Wind Energy in Irrigation management · Control of Seawater Intrusion in Coastal Aquifers · Techniques of Desalination of Seawater economically · Design of Hydroponic and other related methods for farming using less water · Integration of Solar Energy, Wind Energy, Surface water and Groundwater for Green house and Poly House Farming and Irrigation · Management of Waste water and Seawater for Irrigation · Water Management for Industries · TPI for all Water Resources Engineering Projects • Training and Services for all Water Resources Engineering Projects
4.	Dr. P. L. Patel	Experimental and numerical investigations on transport of sediments and bed level variations in Alluvial rivers. Prediction of sediment yield and morphological studies of Alluvial rivers. Hydrodynamics of natural rivers. Stochastic approaches in modelling of turbulence in rigid and mobile boundary channels. Hydrodynamic modelling of floods. Hydrological modelling in assessment of water availability in the basin. Multi-objective approaches in optimal irrigation planning. Spatial and temporal variability of	• Morphological changes in planform and bed level variations of alluvial rivers. • CFD analysis of Hydropower projects to solve their specific problems. • Analysis and design of water distribution and storm water drainage system. • Efficient design of hydraulic structures.

		climatic and hydrological parameters in river basins. Inflow prediction into reservoirs.	
5.	Dr. Atul K. Desai	Structural Dynamics, Soil Structure Interaction, Fiber reinforced soil, Machine Foundations, Geo Textile, Roller compacted concrete for Rural Road development. Turbo Machinery Frame Foundation, Fiber Reinforced concrete & its damping, Bridge engineering, Wind induced oscillation in structure, energy dissipation, Earthquake engineering & structural forensic, Pile raft foundation, Beam-column joint, Bridges subject to seismic loading, Synthetic time history analysis, Analysis and designing of tall structure (such as microwave towers, chimney, cooling tower, steel structure)	• Tornedo, cyclone modelling in CFD for improving Tall building resistance against winds. • Fiber reinforced mortar and plaster for improvement in seismic performance of tall buildings with Infill wall effects, PT Beam and Slab behaviour with infill wall. • Use of waste plastic mineral water bottle for improvement in concrete strength. (Patent already taken). • To find speed of high-speed bullet train on cable stayed bridges for avoiding dynamic Resonance. • To find 3 dimensional most innovative dynamic computer model for high speed bullet train passing above earthen embankments. (Already applied for Patent for testing equipment). • Determination of pile capacity using new O - cell technology. • Seismic Performance of extremely large span hybrid cable stayed suspension bridges. • Use of plastic waste as Geo cell for high altitude mountain cold climate desert soil improvement of "Spiti area" in Himalaya. (Already applied for Patent). • Development of new technology for Rural PQC (Pavement Quality Concrete) road for Indian village. • Seismic performance of different types of buildings in Surat and development of Fragility damage index. • Dynamic Behaviour of tall hybrid and monopole wind mills-towers. • Determination of seismic R factor (Response reduction factor) for different types of bridges. • Development of blast resistance barriers for protection of buildings. • Computer modelling of Nuclear Reactor Shell and foundation in Indian condition with dynamic loading.
6.	Dr. C. H. Solanki	Sub Soil Characteristics Prediction in Geo-technical Engineering Ground improvement techniques Geo-environmental Engineering	• Valorization of industrial byproducts for the potential utilization as the construction materials. • Utilization of waste of tyre shred for the improvement of weak subsoils • Seismic hazard mapping of using MASW and SASW test methods. • Performance of mechanically stabilized earth walls: • reinforcement, backfill and surcharge effects • Reinforced granular column for deep soil stabilization • Liquefaction hazard mapping • Fiber reinforced clay soil • Rapid assessment of compressibility parameters • Bio char and its applications in geotechnical engineering

			• Effect of degree of saturation on strength properties • of soil using geo cells • Solutions for foundations on problematic soils
7.	Dr. Krupesh A. Chauhan	Urban Planning Urban design Urban infrastructure planning Housing Road Safety and Pavement Design	• Rural/ Urban/ Regional Planning & Design • Urban Infrastructure Planning & Management • Green Building & Smart City Project - Rating / Auditing/ Performance Evaluation
8.	Dr. M. Mansoor Ahammed	Environmental Engineering Household water treatment Anaerobic waste treatment Health-related water microbiology	• Greywater treatment and reuse • Anaerobic treatment of organic fraction of municipal solid waste • Household water treatment • Reuse of water treatment residual
9.	DR. P. G. Agnihotri	Application of Geospatial Technology Flood Mitigation Water Resources Engineering	• Preparation of flood mitigation plan for flood prone zone • Disaster Management under GIS Environment • Ground Water recharge and exploration
10.	Dr. Rakesh Kumar	Utilization of Slags, Geo synthetic, Chemical Stabilizers, Cement, Fly ash, lime and Others Non-Conventional Materials for Subgrade, Subbase and Base Engineering Use of LWD, FWD, and others NDT instruments for QA & QC of Pavement. Planning, design, and implementation of Public Bus Transit (BRTS) Pavement Engineering (Design, Construction, Evaluation, Maintenance, and Rehabilitation) Highway Economics Analysis using HDM-IV and others Softwares	• Application of NSV for functional evaluation of pavement • FWD for structural evaluation of pavement.
11.	Dr. R. A. Christian	Air pollution Fuzzy Logic application to environmental engineering	• Air Pollution control and mitigation • CEMS and ETS for industries • Waste water treatment especially sewage • STP design • Environmental Audit Work
12.	Dr. Sandip A. Vasanwala	Computer aided structural analysis Engineering mechanics Structural analysis Computer applications in civil engineering Neural network application in structural engineering Earthquake resistance design of structures Performance evaluation & capacity based design of concrete structures	• Vetting of Structural Design and Drawing of High rise residential Concrete Building Structures • Structural Proof checking of Tensile structures • Proof checking for Design of foundations of High mast tower • Condition assessment of Over Head water tank and High rise / Medium rise concrete residential / commercial building structures • Proof checking of structural design of concrete bridges

		Preliminary design of structures Neural application for preliminary design of space structures	• - Proof checking of Box Culvert structures
13.	Dr. S. M. Yadav	Hydraulics of Alluvial Rivers Application of Soft Computing Techniques in WRE Surface Hydrology Hydrodynamics of Natural River Irrigation Planning & Management Reservoir Operation, Sediments & Sediment Yield Sea Water Intrusion & Ground Water Quality Modeling Construction Management	• Design and executed long distance pipeline successfully. Part of design and execution of world's biggest water supply network. • Analyzing flood mitigation measures for the central Indian Rivers like Ganga, Gandak and Ghaghara. • Interested in the collaborative research and consultancy work in the area of hydrodynamic modelling of floods and advanced flood forecasting techniques.
14.	Dr. V. L. Manekar	Sediment Laden Flow Modelling and Simulation Ago-Climatic Modelling Hydrodynamic Flood Modelling Impact of LULC &Climate Change on Water Resources	• Presently working on the estimation of the factors contributing runoff which is essential component of the hydrological processes for its efficient management.
15.	Dr. Ashish Dhamaniya	Dynamic Traffic Flow Modeling Highway Capacity and Level of Service GIS and GPS applications in Transportation Engineering Pedestrian Flow Modelling and Facility Design Road Safety, Pedestrians and Motorists	• Automation of Toll Plaza Operations • Dynamic Toll Pricing Framework • Data extraction and evaluation using Artificial Intelligence • Road Safety Implementation Framework • Transport integration tools for supply chain management
16.	Mr. A. J. Shah	Steel structure Cold formed steel Rehabilitation & retrofit of structure Wind Engineering Disaster management with respect to Earthquake and innovative steel structures	
17.	Dr. Dilip A. Patel	Construction project management; Construction technology; Contract, dispute, and claim Management; Project appraisal, risk management, and feasibility study; Quality and safety management	• Asset management by developing building information modeling (BIM); Developing construction safety and quality audit manual for construction; Application of latest demolition and non dig techniques; Preparation of construction demolition and waste management plan; Enhancement of bridge resilience and its asset management; Enhancement of water infrastructure resilience and its asset management; Digitalization of intangible and tangible heritage structures and their conditions assessment; Application of information technology in construction project management; Building services
18.	Dr. Gaurang R. Vesmawala	Earthquake Engineering, Structural Health Monitoring, Optimum design of space structures, Neural network applications in structural	• Neural network applications in Structural Engineering • Digital image correlation techniques in Structural Engineering • Seismic design of steel-beam column joint with fuse details • Concrete with waste utilization

		engineering and computer analysis & design of structures,	
19.	Dr. K. D. Yadav	Environment Engineering:- Solid and Hazardous Waste, Composting, Vermicomposting, Ecological Sanitation, Organic waste Management, Greywater treatment, Flower waste utilization , Garden waste disposal , Constructed Wetland, Bio- remediation and Leachate Treatment	• Composting and Vermicomposting of organic waste, Flower waste management- Conversion of waste to neutrient rich manure , Greywater treatment , Usr constructed wetlands technology, Analysis and Design of STP & ETP, Reuse of Greywater for non potable purpose, Analysis and design of MSW and Hazardous waste landfill, Leachate treatment, Environmental Audit work, Monitoring and Analysis of Industry performance
20.	Dr. P. V. Timbadiya	1) Surface water hydrology 2) River analysis system 3) Hydrodynamic (Flood) modeling 4) Morphological Study of River 5) Fluvial Hydraulics 6) Dam Break Analysis 7) Water Distribution Network Design and Analysis 8) Design of Storm water drainage system and its analysis 9) Design of Sewerage Network and its analysis 10) Design of Canal 11) Climate Change Impact Study Surface water hydrology River analysis system Hydrodynamic modeling	• Study on Climate Change impact on Water Resources of basin • Local Scour around tandem and staggered bridge piers • Urban Flood modelling using 2D hydrodynamic modeling and quantification of Hazard, Vulnerability and Risk
21.	Dr. Satyajit Patel	Utilization of Industrial solid wastes in Civil Engineering Constructions, Geo-environmental Issues, Soil stabilization, Ground improvement, Geo-synthetics for road pavements	• Technology development for manufacturing angular shaped high strength fly ash aggregates for use in construction activities as a replacement of natural stone aggregates. • Ground improvement using non-conventional materials for road pavements on clayey subgrade.
22.	Dr. S. R. Suryawanshi	Computational Mechanics, Analytical Modelling of Structural Concrete, Flexural and Non-Flexural Behaviour of Concrete Structures.	• Utilization of C & D Waste as per UN agenda of Holistic Sustainable Development and NITI Ayog (GOI) Targets • Structural Health Monitoring Through IoT (Internet of Things) • Fire Performance of the Structures • Analysis and Design of Special Structures such as High Rise Buildings, Bridges, Bunkers, Silos, Oil and Water Tanks etc. • Repair, Rehabilitation and Retrofitting of concrete structures • Design and Numerical Analysis of Concrete Structures for Other than Gravity Forces • Mix Proportions of Special Concretes
23.	Dr. Shriniwas S. Arkatkar	Heterogeneous Traffic Flow Modeling and Simulation Traffic Operation and Management	• Intelligent Transportation Systems • Advanced Data collection methods for crash risk estimation

		Transportation Systems Planning,Design and Operation Public Transportation and Sustainable Transportation Road Safety and Simulation	• Human factors and implications in the design
24.	**Dr. Yogesh D. Patil**	Earthquake engineeringFiber reinforced concreteSteel & reinforced concrete beam-column joint and design of steel structures	• Polymer Modified Concrete using various additives and fillers. • Utilization of waste plastic like PET, Polypropylene, PVC, Agricultural Waste like CNSL, POFA, etc. Industrial Waste like FlyAsh, Red mud, Glass Powder, GGBS, etc. • Behavior of different studs in shear and tension (Composite Beam/ Bridges)
25.	**Shri. N. N. Patel**	Wastewater Engineering Solid Waste Management Fuzzy logic applied to Environmental Engineering GIS and GPS wrt Surveying	
26.	**Dr. Anant Parghi**	Seismic analysis and design smart materials and their structural application (Shape memory alloys, Nano materials) seismic retrofitting of steel and masonry structures recycle/reuse of industrial wastes for structural applications, finite element analysis structural dynamics, constitutive relationship application of advanced composites materials-fiber reinforced polymer(FRP) and sprayed-Fiber reinforced polymer multi-criteria optimization and statistics.	• Use of suitable 3-D printing concrete; • Use of recycled aggregate concrete in the road construction. • Use of advanced composites Fiber reinforced (FRP), and superelastic shape memory alloys (SMA) rebar in the infrastructures • Forensic investigation structures • Application of sprayed-fiber reinforced polymer for the retrofitting of existing deficient infrastructures • Testing of large-scale structural elements under seismic loads • Seismic risk and hazard analysis of existing infrastructures • Destructive and nondestructive testing of structural elements
27.	**Dr. Bhaven N. Tandel**	Noise pollution modelling and mapping Health impact of noise pollution Air quality modelling and mapping Indoor air quality Odour pollution EIA & Environmental legislation	• Integrated road traffic noise mapping in urban Indian context. • Evolutionary computation based modelling of human work efficiency in a traffic noise environment. • Mitigation strategies for urban road traffic noise with special emphasis on silence zones. • Modelling of vehicle driver behaviour and road traffic noise correlation. • Modelling of cognitive task learning of school / college children exposed to traffic noise environments. • Mapping PM 2.5 and PM 10 for Indian urban cities using real time data from low cost sensor networks. • Indoor environmental quality of naturally ventilated classrooms.

			• Development and comparison of ambient air quality prediction models using multiple linear regression and artificial neural networks.
28.	**Dr. Patel Chetankumar Ramanlal**	Transportation Planning Town Planning Traffic Planning Geospatial Solutions	• Application of GIS, Big Data and IoT in Urban Planning. • Freight Transportation and its Impact on urban mobility • E-Mobility and Autonomous vehicles for developing nation • Land Management Policy for Mega Project at peri urban areas. • Women Empowerment in Urban Planning • Climate change mitigation strategies for compact urban areas • Dron and BIM to manage urban infrastructure
29.	**Dr. Ganesh D. Kale**	Effect of Climate Change on Hydrology Rainfall Runoff Modelling Application of GIS and Remote Sensing in Water Resources Engineering Application of GA Fuzzy-Logic and ANN in Water Resources Engineering Optimization in Water Resources Engineering	• Hydrologic and hydraulic modelling of the Panchganga River basin (Water Resources Engineering). • Prioritization of divisions, districts and blocks of the Rajasthan state for • groundwater management and investigation of factors affecting significant trends in Groundwater levels of blocks of the Rajasthan state (Water Resources Engineering). • Analysis of stormwater drainage system of Southwest Zone of the Surat city in the context of climate change (Water Resources Engineering). • Estimation of future streamflow of the Upper Godavari River Basin by using the SWAT model (Water Resources Engineering).
30.	**Mr. J. B. Patel**	Ground Improvement	• Reliability assessment of Reinforced soil wall for flood hazards • Hybrid retaining wall • Tiered Reinforced soil wall • Pseudo static, pseudo dynamic and dynamic analysis of earthen dam
31.	**Dr. B. Kondraivendhan**	Pore structure characterization and modeling of pore size distribution of cement based materials. Effect of pozzolanic materials addition/replacement in cement based system. Strength and durability studies on cement based material. Studies on reinforced concrete corrosion. Repair and rehabilitation of concrete structures	• Chloride, sulfate and carbon-di-oxide induced rebar corrosion in concrete • Alkali Activated Concrete • LC^3- an alternative binder in Cement based materials • Limestone concrete • Determination of ITZ of cement based materials • Utilization of EAF slag in concrete • Geo-ferrocement confinement
32.	**Dr. Namrata D. Jariwala**	Helth related issues in solid waste mangement practice Environmetal Education Environmet and health Air pollution	• comparison of indoor air quality and outdoor air quality in industrial environment • Source apportionment study • Heavy metal analysis of air borne particles

			• Aerosols and particulate matter measurements using remote sensing data • Correlation of particulate matter concentration with temperature profile of area • Monitoring of surface water quality using remote sensing data • Assessing health risk of workers using poor indoor air quality
33.	**Dr. Tailor Ravin Maheshkumar**	Urban Infrastructure Planning Pavement Design and Assessment	• Preparing Town Planning Scheme for optimize land utilization • Preparing redevelopment plan for old city areas to balance various impacts of urbanization through Local Area Planning • Performing social impact assessment of various projects • Accessing city's future growth opportunities considering most influential factors through Geospatial Techniques • Urban Infrastructure planning and monitoring • Heritage area conservation planning • Redefining Green space Index evaluation for different climatic and geographical conditions • Predicting optimum carrying capacity for city development considering available natural resources and city resilient capacity, • Accessing city security through IoT and Geospatial Technologies • Accessing quality of life of city residents through measurement of various indices like QLI, Poverty Index etc., • Applying different approaches to optimize value capture for various urban infrastructure projects
34.	**Dr. Shailendra kumar**	Ground Improvement Techniques, Soil Stabilization, Reinforced Earth & Geosynthetics and Geotechnical Earthquake Engineering	• Pullout capacity of granular pile • Liquefaction remedial measures • Remedial measures for contaminated soil
35.	**Dr. (Mrs.) Shruti J. Shukla**	Geo-technical engineering and soil improvement techniques Pursuing research in the field of piled raft foundation	• Durability of Commercial Waste Bagasse Ash and Ground Granulated Blast Furnace Slag Stabilized High Plastic Clay • Reduction of Lateral Earth Pressure on Retaining Wall By Expanded Polystyrene (EPS) Geofoam Inclusions • Behaviour of Cohesive Soil Reinforced With Waste Tyre Fibres • Experimental Investigations on the Mechanical Properties of Sand stabilized With Colloidal Silica • Detailed Study of Different Types of Backfill Material Used In Geotechnical Engineering
36.	**Mr. Amit J. Solanki**	Pavement Materials Pavement Design and Analysis Pavement Evaluation and Maintenance	• Design of bituminous mixes in order to achieve superior performance with advanced characterization techniques. • Design of pavements using non-conventional materials

37.	Dr. Ankesh Kumar	Machine Foundation Soil Dynamics Rock Mechanics Analysis of Underground Structures Physical and Numerical Modelling Numerical Methods in Geotechnical Engineering Slope Stability (rock/soil) Blast/Impact Loading in Geo-Materials.	• Dynamic response of machine foundation resting on weathered and highly fractured rockmass • Support design for tunnels in squeezing ground condition • A novel approach for the prediction of the strength of anisotropic rock under true triaxial stress condition • Creep behaviour of soft rocks • Effect of extreme environmental conditions on the strength of rock and rockmass
38.	Dr. Jitesh T. Chavda	Computational Geomechanics Deep Foundations Deep Excavations Use of PIV Technique in Geotechnical Engineering Physical Modelling in Geotechnical Engineering Seismic Hazard Analysis Dynamic Soil Properties Constitutive Modelling in Geotechnics Conservation of Heritage Structures	• Site Specific Seismic Hazard Analysis for Gujarat state for Heritage Conservation • Heritage Impact Analysis • Finite element analysis of Geotechnical problems • Numerical simulations of Large Deformation problems in Geotechnical Engineering • Experimental and Numerical Evaluation of 3D arching in Soil • Development of Transparent soil for PIV analysis • Advancement in Image processing for Geotechnical Applications • Experimental geotechnics, Geophysical tests, MASW and Microtremor test
39.	Dr. Kashyap A. Patel	Structural Engineering, Steel-concrete Composite Structures, Reinforced Concrete Structures, Bridge Engineering, Structural Health Monitoring, Rehabilitation and Retrofitting	• Concrete cracking modeling using smeared crack approach · Tension stiffening modeling · Time dependent (creep and shrinkage) analysis · Effect of flexibility of shear connectors on composite structures · Finite element modeling using commercial software · Artificial neural network application in structural engineering · Fire performance of structures · Application of FRP composites in construction · Blast engineering • · Metro rail construction and management
40.	Dr. Smaranika Panda	Air Quality Management , Air Quality Modelling, ,Urban and Industrial Air Quality Monitoring, Carrying Capacity Studies, Chemical characterization of Particulates, Indoor Air Pollution, Exposure Analysis, Health Risk Assessment, Source Apportionment, Receptor Modelling	• Air quality monitoring using low cost sensors: performance evaluation in various environmental scenarios • Quantification of pollutant concentrations using remote sensing and GIS • Designing Carrying Capacity based Air Quality Management framework for industrial clusters • Personal exposure & health risk assessment of street vendors in contrasting land uses of Surat • Emission inventory of exhaust and non-exhaust air pollutant emissions for Surat city

41.	**Dr. Tamizharasi G**	Earthquake Engineering Structural Dynamics	• - Structural Analysis: Static and Dynamic (Linear and Nonlinear) - Structural Design: Earthquake Engineering (Reinforced Concrete Structures) - Behaviour of buildings under earthquake shaking - Checking the compliances given in building code provisions.
42.	**Dr. Vishisht Bhaiya**	Seismic Vibration Control and Anti-Seismic Devices Probabilistic Framework for Seismic Design and Performance Assessment Uncertainty Modelling in Dynamical System Discrete Element Modelling Rehabilitation & Retrofitting Disaster Mitigation and Management with respect to Multihazard events	• Bending, Buckling and free vibration analysis of composite plates • Wind Vibration Control of Tall Structures • Performance Assessment of Structures using Artificial Intelligence

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Department of Computer Science & Engineering			
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.	Prof Devesh C Jinwala	Information Security & Privacy, Information Security & Privacy in Resource Constrained Environments, Machine Learning for Information Security and Privacy, Requirements Specifications and Analysis	• Mitigation of Denial of Service Attacks in the Wireless Sensor Network and the IoT Protocols. • Key Aggregate Searchable Encryption with various properties like Query Expressiveness, Conjunctive key word search, search over multi-owner data, improving the query performance, multi-delegated search, Search result verifiability, Aggregate Searchable Encryption with Result Privacy, Encrypted data ordering with functional encryption and Break-the-glass access control in Key Aggregate Searchable Encryption in the Cloud. • Decentralized Context-aware Access Control mechanisms for the IoT systems. • Resolution of Conflicts in the Non-functional requirements. • Static Analysis of the Source code for resolution of the Security Vulnerabilities, using tools like SonarQube, Coverity Scan. • Software modeling, verification and analysis using tools like Atlas, Alloy Analyzer, the language Z. • Applications of the Wireless Sensor Networks in the implementation of Secure Cyber Physical Systems in Environmental Engineering domains – stress, strain in civil structures, moisture control in a field, etc. • Privacy issues in the Cyber Physical Systems. • Applications of Generative Adversarial Networks with a focus on the Cyber Physical Systems. • Adversarial Machine LEarning and issues.
2.	Prof Mukesh A Zaveri	Computer Vision, Multimedia Processing - (Image Processing, Audio and Speech Processing), Internet of Things, Wireless Sensor Network, Natural Language Processing, Machine Learning, Visual Cryptography, Biometric and Forensic Analysis	• Humor identification • Skin cancer detection • Target detection and tracking • Video analytics: Surveillance, Summarization • Machine translation • Speech recognition • Biometric multi-modality based recognition • Deep learning based multimedia processing • Multi biometric based authentication • Internet of things based resource optimization • 3D scene creation and image restoration
3.	Shri Rakesh P Gohil	Image and Video Processing, Machine	• Use of Machine learning techniques for Image and Video Optimisation • Video tracking • Video Captioning

		Learning, Internet of Things, System Programming and Embedded Systems	• Video Stabilization • Human act detection using image/video processing • Analytics of video for monitoring of traffic • Recognition of Human activity through neural network • Content based sampling • Image and video Captioning • IOT based smart agriculture • IOT based emergency health monitoring system • IOT based home automation • IOT based Efficient transportation systems • Development of web server using SOC • Smart lighting solutions for smart cities • IOT based multi-parameter patient monitoring system
4.	Dr Rupa G Mehta	Big data analytics, Social media data analysis, Document analysis and recommendation	• Expert system for legal document analysis and recommendation • Identifying influencing person/events for specific domain of the society based on the social media data • Sentiment analysis of the societal domain and prediction of action/reaction related specific event using the activity on the social media • Developing efficient solution for Smart city development, like ML based efficient garbage collecting system for Smart city • Study impact of various parameters for the scholarly rank generated by various scholarly platforms like Research Gate
5.	Dr Krupa N Jariwala	Human Computer Interaction, Cognitive Computing, AI, Machine Learning, Image understanding	• Gaze based task detection using low grade video cameras. • Accessibility and usability study for autonomous vehicles. • Reinforcement Learning to generate trading signals for financial analysis. • Time Series forecasting & modeling for stock price prediction. • Automated question generation and grading system. • Efficient Route optimization. • Forgery detection techniques in images and videos. • Content Based image retrieval of building floor plan images. • Text recognition from multimodal documents.
6.	Dr Dipti P Rana	Data Mining, Machine Learning. Soft Computing, Big Data Analytics, Pattern Recognition, Natural Language Processing, Database Management System, Web Application, Computer Organization	• Development of novel machine learning algorithms for big data • Development of novel data preprocessing and machine learning algorithm for imbalanced data • Analysis and development of big data structure, storage, access and retrieval issue • Solution for mining based on Utility • Discovery of semantic and pragmatic information using NLP • High performance solution for big data applications • Novel solutions for Social media platforms like News, Scholarly Platform, etc. • Improvement of Societal needs using big data solutions for Health, Education, etc. • Recommendation systems for professions like Health, Legal, e-commerce, government departments, etc. • Design of IoT based software solutions for Agriculture, Disease, etc. • Innovation with temporal and geospatial big data • Design of innovative visual web application
7.	Dr Udai Pratap Rao	Information Security & Privacy , Privacy in	• Privacy Enhancing Technologies for Edge-Envisioned Environment (Smart Cities & Smart home)

		Location Based Service, Big Data Privacy, Security and Trust management in Online Social Networks (OSNs), Security and Privacy in Internet of Things (IoT) and Cyber Physical Systems (CPSs), Blockchain, Distributed Computing	• Provable privacy solutions for vehicular edge environment • Privacy-preserving trajectory publishing • Secure-multi party computation for spatial privacy • Homomorphic encryption for enhanced location privacy preservation • Defending Topology Inconsistency Attacks in Low Power and Lossy Networks (LLNs). • Sybil Attack Detection and Mitigation in Internet of Things (IoT) • Designing Methods of Secure and Reliable Communication in IoT Networks. • Designing White Box Encryption Schemes for Constraint IoT Devices • Designing Lightweight Authentication Techniques for Cyber-Physical Systems (CPSs) • Decentralization in IoT using Blockchain Technology • Defense Mechanism to Protect Users from Profile Cloning Attack on Online Social Networks (OSNs) • Sybil attack detection mechanism in Online Social Networks (OSNs) • A Trust Inference Approach for Online Social Networks (OSNs) • Scalable anonymization techniques for privacy preserving Big Data Analytics • Container security
8.	Dr Sankita J Patel	Information Security and Privacy, Secure Computation, Privacy Preserving Data Publishing, Security and Privacy Issues in Online Social Networks, Security and Privacy Protocols for Internet of Things, Security and Privacy Issues in Cyber Physical Systems, Biometric Cryptosystem, Blockchain Technology, Software Requirement Specification and Analysis	• Secure Authentication Protocols for Distributed Internet of Things • Prevention of Privacy Attacks for Online Social Network Data Publishing • Machine Learning Approaches for Detection and Prevention of Distributed Denial of Service Attack • Methods for Securing Fingerprint Templates for Biometric Authentication in Single/Multi Cloud Environment • Template Protection and Key Generation Techniques for Multimodal Biometric Systems • Secure Authentication Protocols for Low Power Wide Area Networks of Cyber Physical Systems • Protocols for Device Authentication in 5G Cellular Networks • Leveraging Blockchain technology for various application domains • Secure Multiparty Computation protocols for Private Computation at cloud servers
9.	Dr Bhavesh N Gohil	Security and Performance issues in distributed/cloud/edge /fog computing	• Intrusion detection/prevention in cloud/edge computing • Load balancing in cloud/edge computing • Energy efficient task and VM allocation/scheduling in cloud/edge/fog computing • VM migration in cloud/edge computing

10.	Dr Balu Parne	Security in Mobile Communication Networks, Authentication and Key Agreement in M2M Communication / Internet of Things, Information Security and Privacy, Security in IoT based Applications, Blockchain Technology, Security in E-commerce and Social Networking.	• Authentication and Key Agreement Protocols for 5G Communication Networks. • Lightweight Secure and Privacy Preserving Authentication Protocols for IoT based Applications. • Group based Authentication Protocols for IoT based Applications. • Machine Learning based Approach for Security in Social Networking and E-commerce. • Secure Key Establishment in Smart Grid Technology. • Data Security and Privacy in Smart Grid Technology. • Secure Authentication and Key Agreement Protocols for Low Power Wide Area Network (LPWAN). • Blockchain enabled Public Key Infrastructure based Solutions for Internet of Things (IoT).
11.	Dr Keyur J Parmar	Information and network Security and Privacy, Cyber Security, Encrypted data processing in Wireless Sensor Networks/Internet of Things, Information Security & Privacy in Resource Constrained Environments such as WSNs / IoT, Security protocols for key distribution in WSNs/IoT, Cryptography, Blockchain Technology, Security and Privacy Issues in Blockchain Technology, Security and privacy issues in Web/Android applications.	• Design and analysis of security algorithms and protocols to prevent security attacks in resource-constrained Wireless Sensor Networks (WSN) and Internet of Things (IoT). • Applications of cryptography in the area of Security, blockchain technology, WSNs, etc. • Encrypted data processing in WSNs/IoT • Key distribution protocols for resource constrained Wireless Sensor Networks (WSN) and Internet of Things (IoT). • Design, analysis, and development of novel applications of Blockchain Technology and Smart Contracts • Security and privacy issues in Blockchain technology and smart contracts • Security and privacy issues in Web/Android applications.
12.	Dr. Alok Kumar	Wireless Sensor Networks, IoT, Information/Network Security, Blockchain	• Secure and Reliable Multicasting Protocol of IoT devices • Distributed Attribute Based Encryption • Combinatorial design based key pre-distribution schemes
13.	Dr. Dhiren R Patel	Blockchain Technology Cyber Security AI Sustainable Technologies	• CBDC, Bitcoin Inscriptions, Oracle Data Streams • Defensive and Offensive Security Framework • FATE framework • Precision Farming and Food Supply Chains

14.	Dr. Abhilasha Chaudhuri	Machine Learning, Dimensionality Reduction Techniques, Meta-heuristic Optimization Algorithms, High-dimensional data classification	• Brain Computer Interface, Cognitive workload assessment, Gene selection approaches
15.	Dr. Naveen Kumar	Named Data Networking, Software Defined Networking, Network Security, Artificial Intelligence and Machine Learning, Natural Language Processing, Meta-heuristics	• Detection and Mitigation of Interest Flooding Attack in Named Data • Networking (NDN) • ・Detection and Mitigation of Cache Privacy Attack in NDN • ・Detection and Mitigation of Cache Pollution Attack in NDN • ・Integration of NDN to IoT • ・Energy-aware workflow scheduling in Cloud Environment • ・Real Time Fake News Detection • ・DDoS Protection and Prevention using Software Defined Networking • ・Enforcing Data Privacy of Health Related Public Data • ・Fog and Edge Based Applications for Smart City • ・Blockchain based solution for different problems like Supply Chain • Management, Health care, Voting. • ・Improving NDN for bulk data transfer • ・Gnome Data Compression

DEPARTMENT OF ELECTRICAL ENGINEERING

Department of Electrical Engineering			
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. S.N.Sharma	Mathematical control theory Dynamical systems Stochastic processes Stochastic filtering, Algebra stochastic differential equations	• Unresolved nonlinear control problems. • Applications of methods of systems theory and control. • Contemplating classical control results and their significance for today's research.
2.	Dr. A.Chowdhury	Electrical Machines Drives Power system	• Design of Impedance source converters for Renewable energy and Electrical vehicle • Design of Special Machines, Design of Machines for Renewable Energy and Electrical Vehicle, • AI/ML applications to condition monitoring of Electrical Machines
3.	Dr. R.Chudamani	Power Quality Electrical Drives	
4.	Dr. A.K.Panchal	Si nanostructures for improving efficiency of Si based solar cell technology thin film optical structural and electricalcharacterization Comparision studies of different solar PV technologies	• I Would like to work on the design and development of photovoltaic-battery charging systems and its control for fast energy transfer for EV charging stations.
5.	Dr. V.A.Shah	Power Electronics & its applications Power system Hybride Electric Vehicles Micro controller & its applications	• Design, control and energy management of • battery supercapacitor hybrid power source for • electric vehicles • Modelling of Energy storage devices. • Fault tolerance mode operation of multiphase • induction machine • Regenerative Braking of Induction Motor. • Fast battery charging station design and control • with a solar based reserve energy storage system. • Impact analysis of EV on Power Grid
6.	Dr. H.R.Jariwala	Power system	
7.	Dr. Mahmadasraf A. Mulla	Electrical Drives Power Converters Power Quality Renewable Energy	• Development of Commercial Grade Static Var Generator (SVG) • Development of Static Dynamic Voltage Regulator • Development of Battery Management System and Chargers • Development of High-Voltage (11 kV) Capacitor and Inductor Switching using Thyristors

8.	**Dr. P.B.Darji**	Power System Dynamics HVDC FACTS Controllers	
9.	**Dr. P.Kundu**	Application of Digital Signal Processing in High Voltage Engineering Partial Discharge and Condition Monitoring Electromagnetic Field Computation using Finite Element Method	• High voltage testing and diagnosis of electrical equipments, High voltage laboratory design, • Development of insulation systems.
10.	**Dr. V.Mahajan**	Power system stability, FACTS devices	• Artificial intelligence, Cyber security of Smart grid, machine/deep learning for smart grid, Artificial neural network, fuzzy logic, cyber security related encryption/decryption, Restructuring and deregulation, renewable energy sources and its role in smart grid, power system operation and planning, reliability engineering, power system reliability evaluation,
11.	**Dr. H.G.Patel**	Control systems Automation Stochastic process	• Design of Industrial Automation System with PLC, SCADA and/or Industrial Drive. Design of Control and Power circuits for ETP, STP or any Industrial plant.
12.	**Dr. Rakesh Maurya**	Multi-phase Induction Motor Drive, High Power Factor Converters, Power converters for EV battery charging, Resonant DC-DC Converters, Custom Power Devices, Power Converters for Power Quality Improvement	• Green Electric Battery Charging Solutions with • features of reduced power density.
13.	**Dr. S.R.Arya**	Custom Power Devices and its Application, Power Electronic Converters for high performance system, Electric Vehicles Technology, Control of Electric Drives system, DC/DC Converters and Soft Switching Technique,]Power Quality and Optimization Algorithms, Soft Computing and Adaptive Algorithms, Distributed Power Generation System and Smart Grid Technology.	• Power quality: Custom power devices and its control • Hybrid renewable energy system specially Solar • and wind under microgrid concept • Design and application of multi port output • converters • Solar Powered Electric Rickshaw • Battery charging and drives control
14.	**Dr. K.D.Mistry**	Power system	
15.	**Dr. C.P.Gor**	Multiphase Machines and Drives, Fault Tolerance and Detection, Artificial Intelligent Control Techniques , Electric Vehicle	

16.	**Dr. Mahesh Aeidapu**	Power Electronics Hybrid Renewable Energy Systems Optimization	• Grid integration of renewable energy • systems • 2. Development of novel meta-heurisitc • optimization techniques • 3. Optimal sizing and energy management • strategies for hybrid renewable energy • systems.
17.	**Dr. S. Tolani**	Digital Control of Power Electronic Converters Microgrid and Power Quality Electric Drives	• Low-Cost Digital Control of Power Electronic Converters • Design and Control of Isolated Bidirectional Battery Chargers for EV and SST Applications • Multi-phase DC-DC Converters for Automotive Applications
18.	**Dr. Rajasekhararedddy Chilipi**	Self-excited induction generators, power electronics, wireless power transfer, power quality, renewable energy (solar, hydro), distributed generation, and active power filters	
19.	**Dr. R. Radhakrishnan**	tate estimation, Nonlinear filtering, Target tracking	• Application of state estimation algorithms in process monitoring and control
20.	**Dr. Kunisetti. V. Praveen Kumar**	Power Electronics, Electrical Drives, Multi-level inverters and Application of Renewable energy to Electrical Drives	• Multi-level inverters, Grid Tied converters, • Open ended induction motor drives, Electric drives • for vehicular applications
21.	**Dr. Gangireddy Sushnigdha**	Control systems, Optimal control theory, Meta heuristic algorithms	• Application of optimal control theory, Development of novel evolutionary optimization techniques, • Development of path planning algorithms and AI based control schemes
22.	**Dr. J. Venkataramanaiah**	Advanced Switching Techniques, Multilevel Inverters, FACTs Devices, Grid Tie Inverters, High power Converters	• Advanced converters with reduced part count, • Fuzzy and Neural network based switching • algorithms for Multilevel Inverters and MLI for • polyphase applications.
23.	**Dr. Sukanta Halder**	Next-Generation Electric Vehicle Technology. Intelligent Electric Traction Drive Systems for EV, Electric Drives & Power Electronics, Machine Learning/Deep Neural Network (DNN) /ANN based control for EV.	• Wide Band Gap Device Based Next- Generation Intelligent Electric Traction Drive System for Electric Vehicle Application • Next-Generation Electric Vehicle Technology. • WBG (SiC & GaN) Inverter Development for EV Application. • Intelligent Electric Traction Drives System for EV • Machine Learning/Deep Neural Network (DNN) /ANN based control. • Efficient PMSM Drives, Multi-Level Inverters, • Power Converter Developments & Battery Management System.

24.	**Dr. Suresh Lakhimsetty**	Multilevel inverters, Speed control Techniques: AC & DC Drives, High gain converters	• High-Gain Converters, Multi-Level Inverters, Multi- Phase Machines
25.	**Dr. Akanksha Shukla**	Power system planning and analysis, Integration of distributed low-carbon technologies, Modern distribution system, Microgrids operation and planning, AI and ML applications to Power system	• Data driven based modelling and management of distribution system with low-carbon distributed technologies (renewable, storage, EVs), Charging infrastructure planning and operation, Operation and planning of grid connected and stand-alone microgrids, Uncertainty modelling, Artificial intelligence and machine learning applications to Power system

DEPARTMENT OF ELECTRONICS ENGINEERING

Department of Electronics Engineering			
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.	Prof. A. H. Lalluwadia	RF & Microwave Engineering Image Processing	
2.	Dr. (Mrs) Upena. D. Dalal	Wireless Communication techniques 5G technology Wireless systems Optical wireless Signal processing	• SDN in VANET • Intelligent Medical IOT • Cellular planning with Machine Learning • 5G Terchnology
3.	Prof. Naresh B. Kanirkar	CDMA Mobile Communication	• IoT based Smart Automatic Parking System • IoT based Early Flood Detection System • IoT based Smart Agriculture System • Design implementation of Antenna for 5G
4.	Prof. Prashant K. Shah	LMI Based Improved Stability Criteria (DSP based)	• Digital Signal and Image Processing, • Adaptive and Nonlinear filtering, • Artificial Intelligence application • LMI Based Improved Stability Criteria (DSP based)
5.	Dr. Jignesh N. Sarvaiya	Image Processing Image Registration, Deep Learning, Medical Instrumentation	• Bio Impedance Measurement • Deep learning in Healthcare
6.	Dr. Anand D. Darji	VLSI Design FPGA-based systems design Device modelling VLSI DSP architecture Embedded System Design Electronics Instrumentation Signal Processing Bio-medical Signal/image processing	• Wearable low power bio sensor • FPGA based embedded system design • Low cost IoT based embedded systems for agriculture and smart city • Hardware optimization of DSP Architecture • MEMS based sensor for HMI detection • Flexible electronics based sensor design
7.	Dr. PIYUSH N. PATEL	Optical Communications and Networks Photonics Devices & Sensors Microwave Antenna and Wavegudes Metamaterial based Sensors Optical, RF, Metamaterial based Sensors & Biosensors	• Wearable RF Sensors • Metamaterial based Sensors • Optical Sensors
8.	Dr. Zuber M. Patel	HDL/FPGA based design VLSI Design of RISC Microprocessors FPGA/ASIC Design of wireless	• Autonomous drone for plant inspection • LDPC decoding hardware based on deep learning algorithm • Custom RISC-V CPU design for low energy devices • Intelligent accident detection and alerting system

		transceiver hardware Embedded Systems	
9.	Prof. Pinalkumar J. Engineer	FPGA based system design VLSI architecture for real-time signal/image processing High performance embedded computing Embedded and real-time systems	• Robots for Precision agriculture • FPGA implementation of Communication System • Edge Computing for Computer VIsion applications • Smart Camera for Visual Sensor network • Multicore processor architecture for Computer Vision applications • High performance embedded computer vision • FPGA based Embedded CNN architecture • High Performance Embedded Computing for Computer Vision • Embedded Control for robotics and automation
10.	Dr. (Mrs.) Rasika N. Dhavse	Micro - Nano Electronics, VLSI Design, Bio Medical Measurment System	• Paper and pencil based sensors • Novel semiconductor devices • Bio impedance measurement system • Digital Filter Design for biological measurements
11.	Dr. Abhilash S. Mandloi	Fibre Optics Optical Communications, Optical Networks, Free Space Optics, Photonic Devices, Integrated Optics	• design of optoelectronic circuits • optical transmitter and receiver design • design of signal conditioning systems for sensors.
12.	Dr. (Ms.) Jigisha N. Patel	Signal Processing, Wireless Communication Image / Video Coding	• Image compression • signal Detection /Estimation using deep learning
13.	Dr. (Ms.) Shilpi Gupta	5G Technology Massive MIMO Detection Techniques Antenna Design for 5G Applications Waveform Designing for MIMO Radar Free Space Optics Fiber Optic Sensors	• Design and implementation of optical wireless communication link • Deep learning based Wireless system • Design implementation and Fabrication of Antenna for MIMO/ 5G applications • Long Period Fiber Bragg Grating/ Fiber Bragg Grating sensors
14.	Prof. Golak Santra	Patch AntennaMicro-strip filter	• Gain and Efficiency enhancement of Electrically Small Antenna using Metamaterials, • Electrically Small Antenna for portable and wearable devices. • Efficient Millimeter wave antenna for 5G applications. • Optical Antennas and Nano Antenna for short range Indoor application.
15.	Dr. (Mrs.) Shweta N. Shah	Wireless Communication; Satellite Communication, Navigation system, Mobile Communication and standards; Digital Video Broadcast and standards; Cognitive Radio; NavIC/IRNSS.	• Satellite based Navigation process and solution, especially for signal quality, Indoor and Outdoor navigation model development; NavIC based product development for commercial or for research based; Jamming/Spoofing identification and mitigation; SDR based system development; Intelligent Traffic management system as a complete solution; GIS based application development; Mapping of infrastructure with more precision based on NavIC+GPS; Wireless Communication for infrastructure development; Landslide monitoring using GNSS with application; Wireless data analysis using deep learning, Anti drone system.
16.	Prof. Mehul C. Patel	Digital Signal Processing using VLSI	• Design & Implementation of scalable and high-speed Image processing algorithm design on FPGA platform. • Design & Implementation of high speed and scalable encryption and decryption standard for Security application.

			• Design and implementation of communication systems on hardware platforms. • Design and development of various protocols for high speed communication over channel. • scalable and optimum design of f SDR and NFV protocol. • FPGA/ASIC Design of wireless transceiver hardware.
17.	**Dr. Kishor P. Upla**	Machine/Deep Learning Object detection/recognition, Multi-spectral and hyperspectral image processing Image Restoration Bio-medical Image Fusion Information Fusion Multi-Resolution Image Fusion/Pan-Sharpening Image Super – Resolution	• Image fusion using MS and Pan images (Pan-sharpening) and fusion of other modalities • Image Super-resolution for visible and thermal images • Night vision surveillance • Low-resolution face recognition • Image restoration • No-reference Image quality assessment • Video Deblurring
18.	**Dr. Deepak Joshi**	Metaheuristics, Analog Circuits: Design and Optimization, Computational Intelligence, CAD for VLSI	• Many - objective optimization for real world problems, preferably in VLSI design
19.	**Dr. Suman Deb**	Signal Processing,Speech Processing,Speech based Health Analysis, Emotion Analysis based on Speech and Image,Speech Pathology Detection, Voice Conversion/ Speaker Identity Conversion,Pattern Recognition	• Person's Emotion detection from speech • Speech based health Analysis • Different disease analysis from the speech signal • Heart rate analysis from the speech signal
20.	**Dr. Abhishek Acharya**	Physics & Modeling of Nano-Scale Devices, Device-Circuit Interactions in Nano-Scale Transistors, Wide Bandgap Semiconductors and 2D Materials for Devices & Circuits	• Design and Modelling of Solar Cell for High Energy Efficiency • Modeling of High Voltage (40-60V) N /P LDMOS devices • Realization of high quality Gallium Nitride epitaxial FinFET devices for power electronics
21.	**Dr. Kamal Captain**	Cognitive Radio, Signal Processing, Statistical Signal Processing, Wireless Communication, Machine Learning	• Cognitive radio for improving spectrum utilization • Modulation classification in wireless communication
22.	**Dr. Kirti Inamdar**	Microstrip Patch Antenna design using Metamaterials, Wearable Antennas	• Metamaterial based antenna designing • Wearable Antennas • Development of RF active and passive devices
23.	**Dr. Nithin Chatterji**	Device Simulation and Modelling, Semiconductor device physics, Solar Photovoltaics, Memory devices (DRAM)	• Modelling of solar cells for indoor photovoltaic applications. • Modelling of Tandem solar cells.
24.	**Dr. Raghvendra Pal**	Wireless ad hoc Networks, Vehicular ad hoc Networks, Machine Learning for wireless communication, Medium access control.	• Optimal cognitive channel selection using deep learning in Vehicular adhoc Networks. • Efficient channel utilization in the Internet of Vehicles. • Clustering in the Internet of Vehicles. • Analyzing the impact of various Machine learning algorithms on the performance of Internet of Vehicles

			• Prototype designing for the Internet of Vehicles using Raspberry pi.
25.	**Dr. Shivendra Yadav**	Modeling and simulation of Micro Nano Semiconductor Devices, Application and Design of Nano Devices for Biomedical Applications, Linearity and High Frequency Parameter Analysis of Hetero-material Nano Semiconductor Devices, Modeling and simulation of Negative Capacitance in Ferroelectric Thin Films.	• Modeling and Simulation of Micro Nano Semiconductor Devices • Design of Nano Device Sensors for Biomedical Applications • Linearity and High Frequency Analysis of Hetero-Material Devices • Modeling and Simulation of Negative Capacitance in Ferroelectric Thin Films
26.	**Dr. Suresh Dahiya**	Wireless Channel Model, Massive MIMO System, Satellite based navigation.	• Development of FPGA based GNSS receiver for spinning systems, GNSS based attitude determination
27.	**Dr. Vivek Garg**	Optoelectronic Devices (Photovoltaics, Photodetectors), Quantum Technology (Imaging, Sensing and Communication), Energy Storage Devices (Supercapacitors and Fuel Cells), Modelling of Nanoscale Devices, Optical Communication	• Ultrathin Photovoltaic Devices • Quantum Imaging and Sensing • Nanoscale Devices for biosensing application • Quantum communication • 2D material based Supercapacitor • New material excavation for Energy Harvesting and storage
28.	**Dr. Sandeep Mishra**	VLSI Design, Low Power VLSI, Memory Design, Mixed Signal Circuits	• Intelligent Transportation System, Precision • Agriculture

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCE

Department of Humanities & Social Science			
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. Urvashi Kaushal	Postcolonial Fiction, Diaspora Literature, Indian Writings in English, Communication Skills and Employability Skills	• Film Studies and Cultural Studies
2	Dr. Vaidurya Jain	English Language Teaching, Linguistics, Cultural Studies, Indian Aesthetics	• Cultural Studies, Indian Aesthetics

DEPARTMENT OF MATHEMATICS AND HUMANITIES

Department of Mathematics and Humanities			
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. A. K. Shukla	Special functions Integral transforms & Fractional Calculus	
2.	Dr. V. H. Pradhan	Fluid dynamics in porous media with relevance to ground water flow and petroleum recovery Numerical techniques	• To develop Burger's model for viscoelastic fluids to observe the viscoelasticity effects by obtaining the travelling wave solutions • To modify Boussinesq equation arising in stream aquifer interaction problems by an exponential decaying function • To study the effect of sedimentation for non-conservative materials in contaminant transport equations • Numerical simulation of Boundary layer flow equations for porous plates and/or for Micropolar fluids/Power law fluids/Nanofluids • Application of Optimal control theory to enhanced oil recovery • To develop mathematical models for reservoir simulation
3.	Dr. Neeru Adlakha	Mathematical and Computational Biology Bioinformatics/ Biomathematics / Biocomputing Data mining Finite element modeling	• Developing computational and systems biology models to study calcium dynamics in Myoctes with special relevance to disorders of heart • Developing computational and systems biology models to study calcium dynamics in hepatocytes with special relevance to disorders of liver • Developing computational and systems biology models to study calcium dynamics in Beta cells with special relevance to disorders of Pancreas • Developing computational and systems biology models to study calcium dynamics in T lymphocyte cells with special relevance to immunity disorders • Developing computational and systems biology models to study calcium dynamics in astrocytes and neuron cells with special relevance to neuronal disorders • Developing computational and systems biology models to study human thermal systems with special relevance to cancer and physical exercise • Modelling above mentioned biological problems as initial boundary value problems involving fractional differential equations

			• Developing Finite element, finite volume, cubic splines, analytical and hybrid numerical and analytical approaches for the solution of above mentioned problems
4.	**Dr. Hemantkumar P. Bulsara**	Techno innovation to Techno entrepreneurship through Techno Business incubation Marketing Entrepreneurship Strategy Supply Chain Management(SCM) General Management	• Consumer Behavior • Branding, Green Branding, Political branding • Developing Business Strategy • Marketing Strategy • Digital Marketing • Commercialization of Technology innovation, Innovation and Entrepreneurship, Social Entrepreneurship, Techno-entrepreneurship, Technology Business Incubation, Women entrepreneurship • Digital pedagogy
5.	**Dr. Ramakanta Meher**	Differential Equations Fractional Differential Equations Fluid Dynamics Fluid flow through Porous Media Approximation theory Numerical Analysis	• Uncertainty Quantifications in porous media • Modelling and simulations of Heat and Mass transfer problems in porous media • Recovery rate of Hydrocarbon reservoir problems • Delay Differential Equations • Study of fractional calculus in differential and integral equations • Functional differential equations with infinite delay
6.	**Dr. Ranjan Kumar Jana**	Special Functions and Integral Transform, Operations Research. Mathematical Physics, Fractional Calculus, Mittag-Leffler function Numerical Weather Prediction, Ramanujan's Mathematics	• Study and investigate properties, inequalities and applications of Hypergeometric function in Mathematical Physics, Probability and distribution theory, theory of integral transforms and fractional Calculus • Study and formulate Green Supply Chain • Management models in imprecise environment • Inventory Modeling of different types with deteriorating items • Data Assimilation approach to develop geospatial database of model inputs and simulation of land surface fluxes
7.	**Dr. Twinkle R. Singh**	Fluid flow through Porous media, Non-linear partial differential equations, Burger's equation, Groundwater recharge phenomenon, Analytical approximate Methods, Mathematical Modeling	• Study on Problems related to environment engineering and its impact for society. • Study on problem, related to current strategy of economics during COVID 19 • Analysis of Reactions of pandemic during COVID • Study on strategy of world for forthcoming development with mathematical point of view
8.	**Dr. Urvashi Kausal**	Post Modern Fiction Indian English Fiction and Feminist Literature Themes in Diaspora literature	• New Woman in the Writings of Shashi Deshpande and Manju Kapur • Indo-Caribbean Candian Literature • Place and Space in the novels of M.G. Vassanji

			• Literature on 1971 Bangladesh War from Pakistan and Bangladesh • Life lessons from Indian Mythology • Study of Employability Skills of Engineers • Non-Verbal Communication and Intercultural Communication • Re-Orientation in Movies adapted from Indian Diaspora Fiction
9.	**Dr. Sushil Kumar**	Mathematical modeling Bio-mechanics Fractional Differential equations Moving Boundary Problems Bio-mechanics Numerical Techniques Radial Basis Functions Chebyshev Polynomials	• Mathematical modelling and simulation of partial and fractional differential equations arising in the modelling of heat transfer process in biological systems using Chebyshev polynomials and Radial basis functions. • Mesh-free method for thermal therapies • Mesh-free and spectral method for the solution of differential equation • Semi analytical method for the solution of non-linear fractional differential equations
10.	**Dr. Jayesh M. Dhodiya**	Advance Operation Research Optimization Technique Mathematical Modeling and Simulation Knowledge Based System,Data Mining	• Development of quality timetabling algorithm for any organization • Development of mathematical model based software with which we can understand mute and deaf people language. • Effective solution code (Code) of multi objective optimization problem through evolutionary approach • To study the Nanofluids as an effective coolant in refrigerators, cars etc. by developing its mathematical model.
11.	**Dr. Indira P. Tripathi**	Mathematical Programming Problems, Non-smooth Optimization, Fractional Programming problems, Interval-Valued Optimization, Generalized Convexity, I-fuzzy/Fuzzy Optimization, Variational Control Problems, Semi-Infinite Optimization problems	• Multitime Control-Optimization problems, • Optimization problems with vanishing constraints, • Interval-valued intuitionistic fuzzy optimization • problems and their applications.
12.	**Dr. Shailesh Kumar Srivastava**	Approximation Theory, Trigonometric Fourier Approximation, Summability Methods, Real/Functional Analysis	• Analysing the approximation properties and determining the degree of approximation (error/order of approximation) of functions and their conjugates belonging to some Lipschitz classes using different summability methods on their trigonometric Fourier series and conjugate series. • Studying the properties and behaviour of strong convergence of numerical sequences and Fourier series. • Double Fourier series
13.	**Dr. Raj Kamal Maurya**	Reliability Theory and Survival Analysis Estimation under various Censoring Competing Risk Optimum Plan	• Currently working on Compound Optimal Design under Censored Data for lifetime model.

14.	**Dr. Amit Sharma**	Algebraic Coding Theory: Constructions of error-correcting codes such as linear codes over finite rings, skew codes, quantum codes.	• Error correcting codes using skew polynomials.
15.	**Dr. Sudeep Singh Sanga**	Queueing Theory	• Control policies for queueing Models.
16.	**Dr. Saroj Yadav**	Fluid Dynamics	• Mathematical modeling of phenomena arising in fluid flow through porous media including dynamic capillary pressure effect.
17.	**Dr. Vaishali Dhingra**	Time Series Analysis, Econometrics, Quantitative Analysis, Stock Market, Portfolio Management, Financial Management	• Marcro-economic analysis specifically time series analysis and applied research
18.	**Dr. Sourav Gupta**	Linear Water Wave Theory, Integral Equations, Numerical Analysis	• Working on the problems of scattering of surfacewater waves by a pair of unequal thin permeablevertical barriers with non-uniform porosity. The plates are present in a fluid region may comprise of two fluids of different densities (two fluid medium). The method of solution is based on Generlized Hybrid Fourier Transform known as Havelock's expansion theorem.
19.	**Dr. SHIVAM BAJPEYI**	Functional Analysis, Appplied Harmonic Analysis, Sampling-Reconstruction Problems, Neural Network Approximation	• Currently working on applications of sampling and approximation theory to artificial neural networks

DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical Engineering			
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 • Design optimization of mechanical components • Parameters optimization of sustainable manufacturing processes • Application of optimization algorithms to smart manufacturing systems
2.	Dr. H. K. Raval	Metal Forming Analysis Metal Cutting Advance Manufacturing Processes Computer Aided Manufacturing & C.I.M.	• Sheet metal forming analysis like deep drawing, plate rolling • Incremental sheet forming. • Forming of Tailor Welded Blank for automobile application • Computer Aided Manufacturing with CNC FANUC programming • Bulk metal forming analysis like forging, rolling etc. • Metal cutting with Advanced Manufacturing processes.
3.	Dr. D. P. Vakharia	CAD-CAM Tribology and Machine Design	• Computer Aided Design and Analysis of Machine Elements • Tribological analysis of Bearing elements • Enhancement of fatigue life of bearing elements using theoretical and experimental techniques
4.	Dr. K. P. Desai	Cryogenics Manufacturing Science Unconventional Machining Processes	• cryogenics and modern manufacturing processes
5.	Dr. Jyotirmay Banerjee	Computational Fluid Flow and Heat Transfer Multiphase Flow and phase change applications Turbomachine	• Recurrence analysis for identification of two-phase flow regimes in industrial pipes • Design and optimization of Latent Heat Storage systems • Development of accurate numerical algorithms for complex multiphase flows • CFD analysis to depict Vortex rope formation in hydro turbomachines • Dispersion of effluents in lakes and oceans using two-phase jets. • Nucleate and flow boiling analysis for cooling of small scale thermal systems.

6.	**Dr. A. A. Shaikh**	Composite Material CAD/CAE Reverse Engineering	• Development of smart material/shape memory polymer composites - Investigating Shape recovery of Polymer based smart material/smart carbon fibre composite/ Three phase composites with Nano constituents. Material characterization of developed Nano composites • Developing 3D cavities/Microchannel using Laser – Micro Machining - Investigating requirement of Various Raster shapes and Mc process parameters for various shapes to make molds using multi pass concept for industrial applications • Reverse Engineering for shape evaluation for additively build shape memory Polymer - Investigation of surface defects (NDT) of composites and smart material. Development of digital model from physical model. • Mechanics of Composites - 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. Future Plan: • 3D cavities for customized shapes for developing micro moulds • Hybrid / multi pass by AWJ on composites.
7.	**Dr. Shailendra Kumar**	AI Applications in Sheet Metal Forming Press Tool Design Incremental Forming Non-traditional Machining Computer Aided Process Planning (CAPP) CAD/CAM/CIM Manufacturing Processes	• 3D Printing of Polymeric parts • 3D Printing of Metallic parts • Incremental Sheet Forming • Non-traditional Machining
8.	**Dr. T. N. Desai**	Six Sigma Total Quality Management Industrial Engineering	• Application of TQM Techniques • Application of Six Sigma technique for quality improvement • Application of Lean Sigma technique for productivity improvement
9.	**Dr. B. M. Sutaria**	Tribology Heat Transfer I.C.Engine Thermal Engineering	• Fuel injection strategies, combustion performance and emission characteristics of a diesel engine. • Investigation of Tribological characteristics of I C Engine, pumps and machines. • Failure and Dynamic Analysis of Laminated Composite and Sandwich Structures.

10.	**Dr. A. D. Parekh**	Refrigeration & Air Conditioning Fluid flow & Heat Transfer Turbo machines	• Performance optimization of automobile air conditioning using R1234yf refrigerant as a replacement to R134a • Improvement of heat transfer using anofluid/NanoParticles in Vapour Compression Refrigeration system • Experimental and numerical investigation of Heat transfer coefficient and frictional pressure drop for two phase flow through mini channel • Experimental and Numerical investigation of Vortex tube refrigeration system • Experimental and Numerical investigation of Vortex tube refrigeration system • Experimental and thermodynamics analysis of Cascade refrigeration system
11.	**Mr. M. B. Maisuria**	Thermal Engg. Energy system Heat exchanger	• Nano Fluid and Heat Exchanger
12.	**Mr. D. B. Gohil**	Mechatronics Robotics Advanced Manufacturing Process	• Application of mechatronics / robotics / advanced machining processes in development of new systems or upgradation of existing systems.
13.	**Dr. D. I. Lalwani**	Machining Optimization Condition Monitoring	• Prediction of Johnson-Cook material model parameters using Oxley theory. • Optimization of mechanical engineering problems. • Fault diagnosis of rotating machinery.
14.	**Dr. (Miss) Jyoti Menghani**	Corrosion Engg. Thin films Physical Metallurgy of Al alloys Tribology	• Development of Corrosion, Erosion and Wear resistant thermal Spray coating • Development of polymer composites for brake pad material • Development of Metal matrix composites by casting technique. • Welding of Ferrous and Nonferrous metals • Friction stir processing FUTURE: • Innovative smart coatings • Surface Characterization of Material
15.	**Dr. Ravi Kant**	Supply Chain Management Sustainable and Green Supply Chain Management Reverse Logistics Lean Six Sigma Knowledge Management Multi Criteria Decision Making Methods	• Reverse logistics for Medical Waste Management Implementation of Circular Supply Chain in Manufacturing Industries • Sustainable Supply Chain Innovation in Manufacturing Industries • Sustainable and Green Supply Chain Management practices in the Small and Medium Scale Enterprises.
16.	**Dr. Beena D. Baloni**	Turbomachiens Jet propulsion Compressible fluid flow	• Subsonic Wind tunnel testing with test section size 600x600 cm 2 upto velocity 12m/s. • Onsite testing of in house developed SV series wind turbine (Design Patent approved) blades for SHAWT. • Development of class 1 C.F. Pump testing facility.

17.	Dr. Purnanand V. Bhale	Alternative Fuels I.C. Engines Energy Conservation Management and audit Non-Conventional Energy Systems	• Design and Development of Solar Assisted Heat Pump based PV/T system • Design and Development of Solar Assisted Biogas Reformer Unit • Installation of Scheffler Solar System of 16 Sq Mt for Cryogenics Applications • Engine Testing on Variable Compression Ratio Engine for alternate Fuels for combustion characteristics • Engine Endurance Testing with alternate fuels • Consultation to civic body related Municipal Solid Waste Management sites for Manure and RDF • Consultation for HVAC Systems for Energy Efficiency and Performance Analysis of Cold Storages and Auditoriums, Specific Buildings (Energy & Buildings) • Development of Biodiesel Plants of small to Large Size • 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) • Sewage based Biogas Power Plant (with civil Department) • Energy efficient Cook Stoves • Use of aquatic biomass for material and energy applications • Use of alternate fuels in cook stoves • Material Compatibility of Metals, Non Metals and Elastomers components of Engine System with alternate fuels from long term compatibility point of view • Consultation for use of Refused Derived Fuels Pallets for Coal fired boilers and Cement kilns • Design and Development of Low cost onion storage for farmers with hybrid cooling • Low Cost Solar PV Panels Cleaning Mechanisms • Fire safety audits of Public Transport Utilities • Energy Audits of Industrial Utilities (As a BEE Certified Auditor) • Characterization of all types of solid, liquid and gaseous fuels for engine and furnace applications • Thermoelectric Generators • 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 educational institutions. • Energy Storage • Consultation for Electric Buses for public Transport • Life Cycle Assessment of Power Plant (Energy System) with cradle to grave approach (With Environment Section of Civil Dept) • Innovative Hot Water Solutions using energy integration and renewable energy for process industry

			• Consultation for AC and Non AC MIDI Buses for Civic Body • Consultation for Engine Powered Aquatic De-Weeders for Rivers • Consultation for Engineering aspects of Vehicle Mounted Suction • Jetting and Recycle Facility for cleaning chocked Sewer Lines (with Environment Section of Civil Dept) • Steam Lines and Boilers Utilities
18.	**Dr. Hemantkumar B. Mehta**	wo-phase flow and heat transfer Microscale flows Pulsating Heat Pipe and Heat Sink Optimization of Thermal Systems Radiative Heat Transfer Finite Time Thermodynamics	• Development of Cryogenic and Hybrid Pulsating Heat pipe • Loop Heat Pipe based Battery Thermal Management System • Flow boiling in Single Layered and Double Layered MCHS • Development of Thermoacoustic heat engine for hybrid vehicles • Development of Correlations for next generation Hybrid nanofluids
19.	**Dr. Harshit K. Dave**	Additive Manufacturing Professes; 3D printing filaments & raw materials; hybrid composites; unconventional machining processes; micro machining processes; modeling & optimization of manufacturing processes	• 3D printing of polymer/metal parts for various applications • Design for Additive Manufacturing • Design and development of AI enabled robots for day to day applications • Application of AI and ML in manufacturing processes
20.	**Dr. R. D. Shah**	Fluid Flow Heat Transfer Numerical Methods	• Upward Swirl Combustor • Inverse Diffusion Flame • Heat Transfer Augmentation • Porous media Combustion
21.	**Dr. A. V. Doshi**	Micro Hydro Turbine Fluid Machines	• Performance verification of radial flow centrifugal pumps • Hydraulic analysis of low specific speed pump as turbine for power generation and energy recovery systems • Micro hydro turbine performance evaluation.
22.	**Dr. Bade Mukund H**	Energy Management & Efficiency Energy Modelling Process Integration Pinch Analysis Fluid Mechanics & Fluid Machines Thermal System Analysis Fuel Cell Technology	• Energy Model-based benchmarking of Stenter Machine used in Textile Dying Houses • Hydrodynamic analysis of Pump as Turbine • Energy Modelling of Building Energy • Energy Analysis of Spray Dryer and Performance Improvement by Energy Recovery
23.	**Dr. Sandeep Soni**	Machine Design; Tribology and Bearing Design; Hydrodynamic/Hydrostatic Lubrication; Materials Characterization, Finite Element Analysis of Machine Components; CAD-CAM; Analysis of Steam Turbine; Wear of Machine Components.	• Design of Machine Components for Friction and Wear; Nano-Lubrication in Machine Members; Analysis of Ball and Rolling Contact Bearings; Simulation of Hydrodynamic Bearings; Development of Polymer Composites for Brake Pad Material

24.	**Dr. Dinesh Singh**	Decision Making in the manufacturing environment	• Friction Stir Welding (FSW) process • Surface composites by Friction stir processing
25.	**Dr. Manish Rathod**	Heat & Mass Transfer Phase Change Process Heat Exchanger	• Design optimization of thermal systems and devices • Development of PCM slurry as effective HTF • Application of Micro encapsulation of PCM • Synthesis and Characterization of Nanofluid • Synthesis and Characterization of Nano encapsulated PCM used in building, solar, transportation applications
26.	**Dr. Vivek D. Kalyankar**	Manufacturing Process Optimization Techniques Casting Material Science	• Ni-Based hard facing as an alternative of Co-based Stellite hardfacing for P91 grade steels • Development of high temperature wear resistant NiCrSiBC hardfacing approach with identified buffer layer on P91 steel • Recommendations of suitable buffer layer material for cladding and substrate under consideration • Investigation on creep behavior of engineering materials • Consultation for welding related problems to industrial products • Significance of metallurgical changes developed in the cladded surface deposited by welding process • Dissimilar welding of advanced grade sheet materials for automobile applications • Mechanical and metallurgical characteristics of NiCrBSi overlay surface on 304SS with and without WC reinforcement • Influence of PTAW process parameters and Co-Cr overlay characteristics with SS 316L substrate material • Parameters optimization of welding process for advanced grade steel using advanced optimization techniques • Application of advanced optimization techniques to engineering problems
27.	**Dr. Achchhe Lal**	Smart and Composite Structures; Probabilistic approaches; Dynamics and thermo-elasticity; Mechanics of Composites; Structural Health Monitoring; Failure and damage Mechanics; Nanomaterials and structures; Extended FEM and Dynamic fracture; Numerical Methods	• Design and reliability of Composite Components; Manufacturing of Nanomaterial structures and their performance; Modelling and simulation of Aerospace structures; probabilistic modelling and simulation of bending, buckling, vibration, failure and fracture of various structural components
28.	**Dr. Shailesh N. Pandya**	Manufacturing Technology Tribology	• Wear behavior of stir cast Al metal matrix composites. • Hybrid investment casting process. • Thermal modeling of Wire Arc Additive Manufacturing (WAAM) process. • Design and analysis of tools and fixtures for FSSW process. • Manufacturing Processes & Design, Structure-property correlation in manufacturing processes, Industrial

			Engineering, Tribology of materials (Fiction & wear), Heat treatment.
29.	**Dr. Vimal Patel**	Machine design and dynamics Fluid machines Refrigeration and air conditioning Metal forming - Tailor welded blanks	• Development of Numerical Model to study thermal analysis of laser irradiated biological tissue phantom • Development of Numerical model to study transport phenomena in open cell foam • Performance evaluation of fire fighter fabric.
30.	**Dr. Vikram Rathod**	Renewable Energy Biogas & its application Gas Engine performance & Emission Turbomachines	• Biogas Upgradation and application • Biogas plant design and development • Horizontal Axis Wind Turbine Design and Analysis • Biomass cook stove • Biomass Gasification and application • Solar Green House Active dryer • Solar Thermal collector • Gas Engine performance and analysis • Gas Turbine compressor design
31.	**Sh. A. B. Makwana**	Heat Exchanger C.F.D. analysis Fuel Cell	• Liquid/gas combustion system • Solid gas flow of granular material • Heat transfer enhancements
32.	**Sh. Anil Mahto**	Robotics Trajectroy Planning Optimization Finite Element Method	• Robotics • Kinematic Analysis of Parallel Manipulators. • Trajectory Planning. • Analysis of Laminated Composite Structures.
33.	**Sh. Nikunj G. Patel**	pressure Vessel Design Conditioning Monitoring Energy Analysis & Bench Marking	• Energy analysis and Benchmarking
34.	**Dr. Vipul M. Patel**	Radiation Transport in Participating Media, Fluid Flow and Heat Transfer in Porous Media, Radiation Therapy, Bio-heat Transfer, Computational Fluid Dynamics	• Development of Numerical Model to study thermal analysis of laser irradiated biological tissue phantom • Development of Numerical model to study transport phenomena in open cell foam • Performance evaluation of fire fighter fabric.
35.	**Dr. Naresh Yarramsetty**	Experimental Heat Transfer, Numerical Heat Transfer, Heat pipes, Refrigeration and Air conditioning.	• Development of a heat sink coupled with a heat pipe for efficient thermal management of electronic components, Development of a pulsating heat pipe-based hybrid pyramid type solar still for productivity enhancement, Design and development of a jet impingement experimental set up for turbine blade cooling..
36.	**Dr. Amit Kumar**	Thermodynamics, Solar Thermal Desiccant air conditioning and Adsorption Refrigeration	• Development of solar powered desiccant air conditioning system. • Development of solar powered Adsorption Refrigeration system. • Development of Numerical Model of desiccant wheel. • Development of Water generation system
37.	**Dr. Prabhansu**	Gasification, Heat Transfer, Solar thermal	• Optimization of tracking device for concentrating PV panel

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

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

		correlation, Welding of Metals and Alloys	• Microstructure and Texture evolution during deformation based manufacturing processes. • Prediction of deformation texture using crystal plasticity models • Recrystallization behavior of materials
50.	Dr. Raju Prasad Mahato	Additive Manufacturing Welding and Joining Material Processing Industry 4.0 in Manufacturing	• Mechanical and Micro-Structural Behavior of Laser Based Direct Energy Deposited and Wire Arc Additive Manufactured Ti-6Al-4V • Friction stir welding of Dissimilar Materials • Development of Industry 4.0 module for Friction Stir Welding
51.	Dr. Ram Singar Yadav	Advanced Machining Processes Unconventional Machining Hybrid Machining Conventional Machining Processes Advanced Engineering Materials	• Hybrid Grinding: Development and Experimental Investigations. • Hybrid Finishing: Development and Experimental nvestigations. • Development of Intelligent Machining System and Experimental Investigations
52.	Dr. Sarote Kamlesh Arun	Bio-Fuels I.C. Engines Alternate Energy Sources Renewable Energy	• Mechanical and Micro-Structural Behavior of Laser Based Direct Energy Deposited and Wire Arc Additive Manufactured Ti-6Al-4V • Friction stir welding of Dissimilar Materials • Development of Industry 4.0 module for Friction Stir Welding
53.	Dr. Sunil Kumar	Plasticity Metal Forming Severe Plastic Deformation Mechanics of Materials	• Conventional and advanced sheet metal forming processes - Deep drawing, incremental forming, micro forming, Tailored blanks • Severe plastic deformation (SPD) processes - Hybrid SPD processes (CGP followed by cold rolling, ECAP followed by cold rolling) • Plasticity - Advanced anisotropic yield criteria, constitutive modelling using dislocation density, Bauschinger effect • Lightweight materials for automotive applications - Aluminum alloys, magnesium alloys, metal matrix composites
54.	Dr. Susanta Behera	Composites Smart Materials and Structures Analytical and Numerical Methods	• Performance evaluation of Polymer Composite Gear • Smart hybrid plate Analysis (Static and Dynamic) • Modelling, Simulation and Analysis of smart structures • Artificial prosthetic design and Analysis
55.	Dr. Yogendra Kuwar	Thermal and heat transfer refrigeration and air conditioning Cryogenics.	• Design and analysis of automotive air conditioning for low GWP refrigerants. • Design and analysis of refrigerator and air conditioning system for low GWP refrigerants. • Study of various mixtures of refrigerants for vapor compression system.

			• Thermodynamic analysis of Claude refrigeration system for low temperature application. • Design and analysis of crycoolers: Stirling and GM types • Cryogenics method for CO 2 separation from various • mixtures. • Design and analysis Cryogenic heat pipe. • Non-conventional refrigeration: Magnetic refrigeration, Vortex flow refrigeration, thermoelectric refrigeration system. • Heat transfer in two phase flow. • Heat transfer in compact heat exchangers. • Waste material utilization for solar concentrator collector for food application.

DEPARTMENT OF PHYSICS

Department of Physics			
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. Kamlesh N. Pathak	Upper Atmospheric Science Earthquake Prediction GPS Technology	Gravitational Wave astronomy ● General Relativity of Exotic Structures ● Atmospheric Aerosols ● Atmospheric water vapor ● Remote Sensing of Earth resources
2.	Dr. Lalit Kumar Saini	Theoretical Condensed Matter Physics Strongly Correlated Electronic Materials Topological quantum nano Materials	Electronic-structure calculation and quantum Monte Carlo(QMC) simulation ● Nano-, 2D and Bulk Materials ● Coulomb drag in Bilayer systems
3.	Dr. Ajay Kumar Rai	High Energy Physics Hadron Spectroscopy	
4.	Dr. Dimple V. Shah	Semiconductor Crystal growth Thin Films Photovoltaic Materials	Micro Hardness Measurement of Bulk Samples ● Gas sensing properties of Thin Films ● Fabrication of nanomaterials using Autoclave (Hydrothermal method) ● Thin films by spin coating method
5.	Dr. Vipul Kheraj	Thin Films and Materials Science Semiconductor Optoelectronic Devices	Laser based materials processing for optoelectronic devices ● Investigations on degradation pathways for thin film solar PV in off-shore conditions ● Optimisation of experimental processes for fabrication of perovskites based thin film solar cells ● Biomedical instrumentations and automation ● Optoelectronic and opto electrical spectroscopy for materials diagnosis and testings
6.	Dr. Y. A. Sonvane	Computational Nanoscience Density functional Theory 2D Materials Nanomaterials &Nanofluids Biological Materials	Perovskite-based materials for solar cell applications ● 2D Materials for Thermoelectric, Toxic Gas sensor and Battery and Super capacitor applications ● Hydrogen Storage, photo catalysis and water splitting applications ● Synthesis of oxide based Nanoparticles & Nanofluids for heat transfer applications ● Graphene like Materials for Energy & Charge Storage Applications ● Modeling of nano-scale materials using density functional theory
7.	Dr. Debesh R. Roy	Density Functional Theory Atomic Clusters & Nanostructures	DNA and inorganic electronics ● 2D materials for toxic gas sensing, thermos electrics and energy storage applications

		Physics of the Materials Nano-Biophysics	● Cluster assembled materials for semiconductor applications ● Toxicity prediction through QSAR methods under DFT for medicinal applications ● Metal oxides and chalcogenides, and their antimicrobial activity
8.	**Dr. Shail Pandey**	Pulsed microwave generated plasma Plasma diagnostics: Electrical method and Optical Emission Spectroscopy Cold atmospheric pressure plasma physics and interaction with various surfaces	Atmospheric pressure plasma physics and applications ● Physics of Plasma interaction with different surfaces ● Optical Emission Spectroscopy of plasmas ● Physics of Microwave generated plasmas and applications
9.	**Dr. Himanshu Pandey**	Band Structural Calculation, Thin films and their Hetrostructures Heusler alloys and their exploration Thermoelectric Materials	• Ab-initio materials modeling and experimental investigations for energy-based applications of Heusler alloys; Wastewater treatment and gas sensing applications of nanoparticles
10.	**Dr. Mithun Karmakar**	Plasma Wave Breaking, Plasma Based Particle Accelerator, Whistler Waves, Particle in Cell (PIC) simulation	• Plasma wave Breaking, Beam Driven Plasma wave
11.	**Dr. Ms. Dipika Patel**	Nuclear reaction study at near the Coulomb barrier energies Study of Break-up and Transfer effects on the fusion fission and scattering mechanisms using weakly bound nuclei Continuum Discretized Coupled Channels (CDCC) and Coupled Reaction Channels (CRC) Calculations	• Nuclear Reaction dynamics using stable and unstable weakly bound nuclei
12.	**Dr. Vikas Kumar Ojha**	Theoretical High Energy Physics, Quantum Chromodynamics, Proton Spin Puzzle	• Proton Spin Puzzle, Proton Radius Puzzle
13.	**Dr. Sharad Kumar Yadav**	Plasma Physics (Nonlinear dynamics of plasma especially focused on turbulence and others nonlinear phenomena in plasma), Soft Condensed Matter (especially interested to understand the structural and dynamical properties of complex liquids such as room temperature ionic liquids, and also others conventional liquids.)	• Development of direct numerical simulation (DNSs) of Magneto-hydrodynamics (MHD) and Hall Magneto-hydrodynamics (HMHD) plasma turbulence at high Reynolds numbers.