



## List of TAP/RAP topics

Name of Faculty	Project Title	Specialisation
Laxmeesha Somappa	Analog/Mixed Signal/RF and High-Voltage IC Design for Brain-computer-Interface SoCs	EE 6
Maryam Shojaei Baghini	AMS IC Design for Magnetic Field Sensing	EE 5, EE 6
Rahul Singh	Design of RF Control/Read-out Integrated Circuits (ROIC) for Interfacing with Quantum Systems	EE 5, EE 6
Rahul Singh	High-frequency/millimeter-wave Integrated Circuit Design	EE 6
Rahul Singh	High-speed Integrated circuits for 6G (wireless) optical links	EE 5, EE 6
Dwaipayan Mukherjee	Resilience of vehicular swarms to malicious attacks: a robust control approach	EE 2
Sandip Mondal	Memory Technology for Artificial Intelligence	EE 5, EE 6, EE 7
Ashwin A. Seshia	Micro/nano-electromechanical sensors and sensor systems	EE 5, EE 7
Jayanta Mukherjee	High Efficiency Power Amplifier Design	EE 1, EE 6
Ashwin A. Tulapurkar	Energy efficient spintronic devices	EE 7
Apurba Laha	Growth, Fabrication, and Characterization of Scandium-doped Aluminum Nitride (ScAlN) Thin Films for Next-Generation Piezoelectric and Optoelectronic Applications	EE 7
Kasturi Saha	Development of Magnetic Field Image Processing	EE 1, EE 7

Name of Faculty	Project Title	Specialisation
Kasturi Saha	Development of ultra-sensitive magnetic field microscope	EE 1, EE 7
Kasturi Saha	Adaptive optics for super-resolution imaging	EE 1, EE 7
Sandeep Anand, Shiladri Chakraborty, Kishore Chatterjee, B.G. Fernandes, Anil Kulkarni	Silicon Carbide (SiC) based medium voltage solar inverter	EE 3
Sandeep Anand, Shiladri Chakraborty, Kishore Chatterjee, B.G.Fernandes	Electric Vehicles: Motors, Controllers and Chargers	EE 3
Dipankar Saha	Wide bandgap GaN-based high electron mobility	EE 7
Dipankar Saha	Quantum technologies	EE 7
Veeresh Deshpande	Advanced oxide channel transistors for 3D integration	EE 7
Veeresh Deshpande	Resistive RAM (RRAM/Memristor) devices and 3D monolithic integration	EE 7
Veeresh Deshpande	Advanced packaging technology and chiplet design	EE 6, EE 7
Veeresh Deshpande	Chiplet based quantum computing system development	EE 7
Debanjan Bhowmik, Ashwin Tulapurkar	Neuromorphic and Ising Computing using Spintronic Nano-Oscillators for Machine Learning and Optimization Applications: Experiments and Modelling	EE 7
Debanjan Bhowmik, Abhijeet Sangle (MEMS)	Self-assembled vertically aligned nanocomposites for memory and neuromorphic computing applications	EE 7

Name of Faculty	Project Title	Specialisation
Debanjan Bhowmik, Bhaskaran Muralidharan	High speed multiple-input multiple-output (MIMO) symbol detection in large MIMO systems for wireless communication using electronic and spintronic oscillator Ising machines (OIM) (and associated teaching and research with Synopsys's tools)	EE 7
Bhaskaran M	ML-integrated device modeling for 2D-single photon detectors	EE 7
Prasanna Chaporkar, Gaurav S. Kasbekar	Maharashtra Drone Mission	EE 1
Prasanna Chaporkar	NSF-Meity: NeTS: Small: Towards Learning Enabled Sustainable Service Handling in 6G	EE 1
Rajesh Zele	CMOS high-performance Digital IC design for RF communications SOC (System-On-Chip)	EE 5, EE 6
Rajesh Zele	RF/Analog Circuit design for next-generation beamformer system for MIMO/6G/Radar applications	EE 5, EE 6
Rajesh Zele	Mixed-signal (ADC/DAC) CMOS IC design for ultra-low-power Biomedical applications	EE 5, EE 6
Saurabh Lodha	Development of 2D single photon detectors for national quantum mission	EE 7
Arun Surendran	Fiber Lasers	EE 7
Shiladri Chakraborty	Integrated SiC power modules for next-gen. EV power electronics	EE 3
Parthib Khound	Design and Development of Cooperative Adaptive Cruise Control under a Stochastic Framework	EE 2
Saurabh Lodha	Design and development of B-Ga <sub>2</sub> O <sub>3</sub> high power devices and circuits	EE 7
Apurba Laha	III-Nitride LASER diodes: The most essential component of optical atomic clock and quantum sensors technology	EE 7

Name of Faculty	Project Title	Specialisation
Virendra Singh	Security of Futuristic Technologies (AI/ML/AR/VR/CPCS/Hardware Design/Quantum Computing)	EE 1, EE 2, EE 5, EE 6
Shalabh Gupta	High-speed integrated circuits for wireline/optical communication links	EE 5, EE 6
Shalabh Gupta	High-speed photonic circuits for optical communication links	EE 6, EE 7
Shalabh Gupta	Communication signal processing and electronics for high-speed wireline/optical communication links	EE 1, EE 5
Anirban Sarkar	RF Beam Scanning antenna and circuits based Joint Communication and EM Sensing	EE 1, EE 5, EE 6







