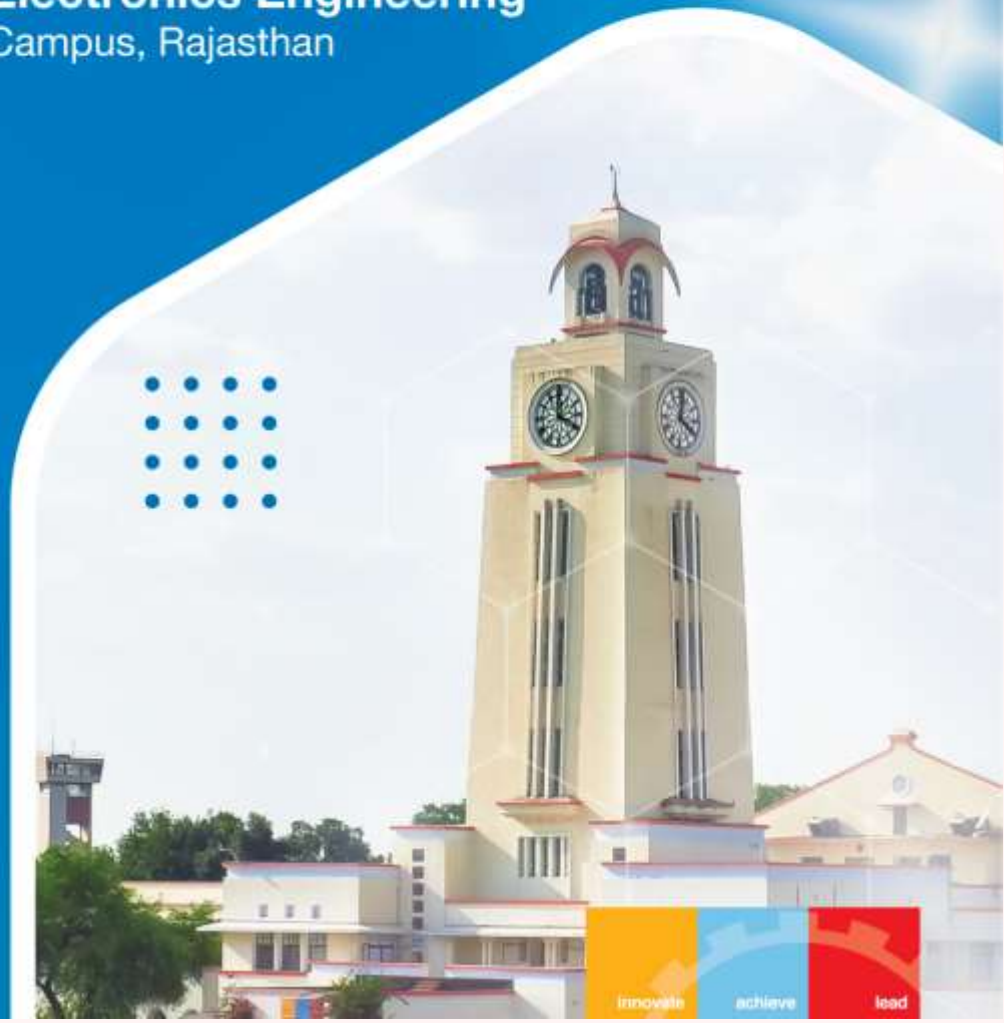**BITS** Pilani
Pilani Campus

RESEARCH
PROFILE

Department of
Electrical and Electronics Engineering
BITS Pilani, Pilani Campus, Rajasthan

innovate   achieve   lead

Department of Electrical and Electronics Engineering (EEE)
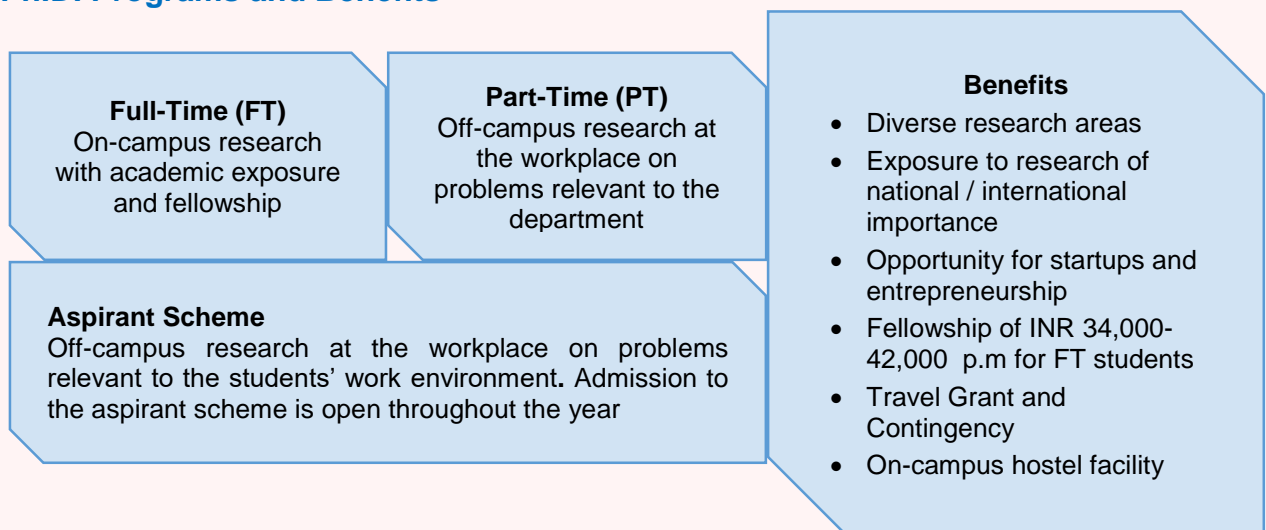
The EEE Department was formed by merging the then-existing Electrical Engineering and Electronics Engineering departments in 1969-70. It started the Instrumentation program in 1973, which evolved into the present Electronics and Instrumentation Engineering in 1998-99. In year 2021, the Electronics and Communication Engineering was started in the department. The EEE epartment offers interdisciplinary courses and projects to provide cross-cutting knowledge to the students to pursue their interests. Our staff members typically have a high sense of purpose and derive great meaning from working together to ensure BITS Pilani's academic and research excellence is well supported.

Vision: To be the foremost global leader in Electrical and Electronics Engineering, advancing education, research, and innovation through strategic industrial partnerships that cultivate visionary leaders and drive technological and sustainable progress

Mission: To deliver quality education by emphasizing a strong foundation, nurturing creativity, and integrating modern Information and Communication Technology tools, To enhance research activities in key focus areas of the Department, driving innovation and discovery. To build robust partnerships with industries and academia, fostering collaboration and mutual growth. To support and promote entrepreneurial initiatives, facilitating technology development and commercialization.

Programs offered	BITS-Pilani, Pilani campus
UG (BE)	1. Electrical and Electronics Engineering 2. Electronics and Instrumentation Engineering 3. Electronics & Communication Engineering
PG (ME)	1. Communication Engineering 2. Embedded Systems 3. Microelectronics
PhD	Full-Time, Part-Time and Aspirant schemes

Ph.D. Programs and Benefits

Full-Time (FT)
On-campus research with academic exposure and fellowship

Part-Time (PT)
Off-campus research at the workplace on problems relevant to the department

Aspirant Scheme
Off-campus research at the workplace on problems relevant to the students' work environment. Admission to the aspirant scheme is open throughout the year

Benefits
- Diverse research areas
- Exposure to research of national / international importance
- Opportunity for startups and entrepreneurship
- Fellowship of INR 34,000-42,000 p.m for FT students
- Travel Grant and Contingency
- On-campus hostel facility

Eligibility Criteria

Minimum academic record of 60 % marks or 6/10 CGPA in one of the following,

- Higher degree (M.E/ M.Tech.) in relevant area (both FT and PT schemes)
- First degree (BE/BTech in Electrical/Electronics Engg./M.Sc. in Electronics/ Electronics Science/Physics (FT only).

Selection Criteria:

Shortlisted candidates will be called for written test/interview at Pilani Campus. Candidates with Higher Degree (M.E. / M.Tech.) as the highest qualification or those with National Fellowships like CSIR / DBT/UGC are exempted from the written test. Selected candidates will undergo coursework for one or two semesters with minimum performance requirements.

Trust Research Areas

LAST DATE TO APPLY: 18 November 2024

APPLY HERE: https://www.bitsadmission.com/phdsem2x2024/Default

RESEARCH ACTIVITIES OF FACULTY MEMBERS

Faculty Members	Major Thrust Areas of Research	Research Profile
Prof. Navneet Gupta (Professor and Head)	Modeling of Micro/Nano Electronic Devices, Flexible and Wearable Electronics, Flexible Antennas and Computational Material Science	**Number of Ph. Ds produced = 9** **i 10 index = 40** **h index = 20**
Prof. V. Ramgopal Rao (Senior Professor & Vice Chancellor)	Nanoelectronics, Micro/Nano-fabricated Sensor Systems, Technology Aware Design Challenges with Emerging Technologies, CMOS Reliability, Bio-MEMS	**Number of Ph. Ds produced = 52** **i 10 index = 193** **h index = 48**
Prof. V. K. Chaubey (Professor)	Optical Wave Guides and Integrated Optics, Wireless & Optical Communication	**Number of Ph. Ds produced = 7** **i 10 index = 25** **h index = 13**
Prof. Anu Gupta (Professor)	Analog and mixed signal integrated circuits, RF integrated circuits, VLSI digital circuits	**Number of Ph. Ds produced = 4** **i 10 index = 25** **h index = 13**

Faculty Members	Major Thrust Areas of Research	Research Profile
Prof. Hari Om Bansal (Professor)	Electrical Power System, Voltage Stability Analysis, Control System A I Techniques	**Number of Ph. Ds produced = 5** **i 10 index = 31** **h index = 20**
Prof. Hitesh Datt Mathur (Professor)	Electrical Power System Operation and Control, Demand Side Management, Renewable Energy Resources, AI/ML applications in Smart Grid Technologies.	**Number of Ph. Ds produced = 3** **i 10 index = 31** **h index = 18**
Prof. Dheerendra Singh (Professor)	Supercapacitor/ Batteries Modelling, WBG based Power Devices & Power Quality, NanoBiosensor fabrication	**Number of Ph. Ds produced = 3** **i 10 index = 18** **h index = 15**
Prof. Karunesh Kr Gupta (Professor)	Digital Signal Processing , Instrumentation	**Number of Ph. Ds produced = 6** **i 10 index = 26** **h index = 16**
Prof. Abhijit Rameshwar Asati (Professor)	VLSI design, Micro/ Nano electronics, VLSI test, CAD for VLSI, Embedded system design, high level synthesis, Hardware development for image processing applications, Artificial intelligence and machine learning applications, Artificial intelligence and machine learning hardware design etc.	**Number of Ph. Ds produced = 4** **i 10 index = 16** **h index = 11**
Prof. Rajneesh Kumar (Associate Professor)	Electronics and Control, Soft Switching Invertors	**Number of Ph. Ds produced = 2** **i 10 index = 14** **h index = 12**

Faculty Members	Major Thrust Areas of Research	Research Profile
Prof. Praveen Kumar A.V (Associate Professor)	Radiofrequency and Microwave engineering, Antennas and propagation, Computational Electromagnetics, RF based physical and material sensors	Number of Ph. Ds produced = 2 i 10 index = 16 h index = 12
Prof. Rahul Singhal (Associate Professor)	Optical Waveguides and Networks, Antenna and Wave Propagation, Frequency Selective Surfaces	Number of Ph. Ds produced = 2 i 10 index = 6 h index = 8
Prof. Sainath Bitragunta (Associate Professor)	Communication Systems, Modeling, Design, and analysis	Number of Ph. Ds produced = 1 i 10 index = 6 h index = 7
Prof. Arnab Hazra (Associate Professor)	Electronic Devices, Nanomaterials, Graphene, Chemical Sensor, Resistive RAM	Number of Ph. Ds produced = 3 i 10 index = 44 h index = 22
Prof. Pawan Kamalkishor Ajmera (Associate Professor)	Signal Processing, Biometrics	Number of Ph. Ds produced = 2 i 10 index = 13 h index = 11
Prof. Nitin Chaturvedi (Associate Professor)	VLSI Design, Computer Architecture	Number of Ph. Ds produced = 1 i 10 index = 8 h index = 8

Faculty Members	Major Thrust Areas of Research	Research Profile
Prof. Vinay Chamola (Associate Professor)	Internet of Things, Embedded system design, Drones, Vehicular Networks, Healthcare, Security	**Number of Ph. Ds produced = 2** **i 10 index = 103** **h index = 49**
Prof. Syed M Zafaruddin (Associate Professor)	AI/ML for 6G Wireless Networks, Quantum Communication, High Frequency (FSO & THz) Wireless Systems, Holographic MIMO, Reconfigurable Holographic Surface, Reconfigurable Intelligent Surface, Distributed Signal Processing	**Number of Ph. Ds produced = 2** **i 10 index = 16** **h index = 12**
Prof. Puneet Mishra (Assistant Professor)	Intelligent control, Fractional order control, Fuzzy systems, Efffect of renewable energy penetration in power systems	**Number of Ph. Ds produced = 0** **i 10 index = 21** **h index = 15**
Prof. Sujan Yenuganti (Assistant Professor)	Instrumentation, Sensor development using smart materials, MEMS and Energy harvesting	**Number of Ph. Ds produced = 1** **i 10 index = 8** **h index = 8**
Prof. Bijoy Krishna Mukherjee (Assistant Professor)	Nonlinear Control, Flight Dynamics, Estimation, Power Systems Operation and Control	**Number of Ph. Ds produced = 0** **i 10 index = 2** **h index = 7**
Prof. Meetha .V. Shenoy (Assistant Professor)	Embedded Systems, Robotics and Autonomous Systems, Networked Embedded Systems, Technologies for IoT, Swarm & Multi-robotic systems, VLSI Architectures	**Number of Ph. Ds produced = 0** **i 10 index = 1** **h index = 6**

Faculty Members	Major Thrust Areas of Research	Research Profile
Prof. Pankaj Arora (Assistant Professor)	Microelectronics and nanophotonics, optical sensors, Silicon photonics	**Number of Ph. Ds produced = 1** **i 10 index = 11** **h index = 10**
Prof. G Sai Sesha Chalapathi (Assistant Professor)	Edge Computing, Internet of Things, Unmaned Aerial Vehicles, Wireless Sensor Networks, IoT and Ai/ML in Precision Agriculture	**Number of Ph. Ds produced = 0** **i 10 index = 6** **h index = 7**
Prof. Aditya R. Gautam (Assistant Professor)	Power electronics for renewable energy, Power quality, active power filters, solar PV integration, microgrids	**Number of Ph. Ds produced = 0** **i 10 index = 8** **h index = 9**
Prof. Ashish Patel (Assistant Professor)	Renewable energy, microgrids, Power electronics for renewable energy	**Number of Ph. Ds produced = 0** **i 10 index =** **h index =**
Prof. Sandeep Joshi (Assistant Professor)	Device to Device Communications, B5G/6G Communications, AI in Wireless Communications, Molecular and Power Line Communications	**Number of Ph. Ds produced = 0** **i 10 index = 11** **h index = 11**

Faculty Members	Major Thrust Areas of Research	Research Profile
Prof. Rahul Kumar (Assistant Professor)	Electronic devices, Semiconductor physics, Material characterization, Epitaxial growth of III-V and group IV semiconductors, Nanostructure growth, Dissimilar Epitaxy, Nanofabrication	**Number of Ph. Ds produced = 0** **i 10 index = 17** **h index = 12**
Prof. Sharda Tripathi (Assistant Professor)	Communication networks, AI powered solutions for IoT communication and applications, Smart grid networks, Design, analysis and development of 5G networks and beyond	**Number of Ph. Ds produced = 0** **i 10 index = 5** **h index = 8**
Prof. Satyendra Kumar Mourya (Assistant Professor)	Semiconductor materials and devices, VLSI technology, Solid state gas sensors, Optoelectronics, Nanoelectronics, Thin films fabrication using PVD, SiC based electron devices, Electrochromic devices	**Number of Ph. Ds produced = 0** **i 10 index = 13** **h index = 12**
Prof. Dinesh Rano (Assistant Professor)	Microwave and mm-wave meta-surface, Antenna Design, RFID, Radio Frequency Circuit Design	**Number of Ph. Ds produced = 0** **i 10 index = 8** **h index = 9**

Ph.D. thesis awarded in 2022-2024 (till October)

S.No	Name	ID	Topic	Supervisor	Co-Supervisor
1	Harshavardhan S.	2016PHXF203P	Computational model predictions of vowel level, age and hearing loss on concurrent vowel identification	Prof. Anantha Krishna Chintanpalli	-
2	Krishna Veer singh	2016PHXF005P	Energy Efficiency Improvement in Plug-in/Solar Hybrid Electric Vehicle using Ultra-capacitors	Prof. Hari Om Bansal	Dheerendra Singh
3	Teena Gakhar	2017PHXP0020P	Doping effects on TiO2 nanotube array based sensors for efficient detection of organic vapors	Prof. Arnab Hazra	
4	Jahagirdar Ankush Chandrakant	2016PHXF0202P	Condition Monitoring of Machines using Vibration and Acoustic Signal Processing Techniques	Prof. K. K. Gupta	-
5	Ankita Dixit	2017PHXF0414P	Investigations and Modeling of the Electronic Behavior of Carbon Nanotube Field-Effect Transistors (CNFETs)	Prof. Navneet Gupta	-
6.	Punit Khatri	2017PHXF0009P	Modeling and Estimation of Drinking Water Quality Index (WQI) based on Integrated Multi-Sensor Array	Prof. K. K. Gupta	Prof. R. K. Gupta
7.	Ritish Kumar	2016PHXF0007P	Design and Development of a Directional Ultra Wideband Slot Antenna	Prof. Praveen Kumar A.V	-
8.	Praveen Kumar Sharma	2016PHXF0502P	Design, Characterization and Analysis of Polydimethylsiloxane (PDMS) Based Flexible Antenna	Prof. Navneet Gupta	-
9.	Devesh Samaiya	2016PHXF0204P	On Foreground Extraction and Semantic Encoding of Visual Information in HEVC Compressed Domain	Prof. K K Gupta	-
10.	Jagdish Chandra Joshi	2013PHXF0506P	Design and Development of a Biometric Access Control System using Facial Images	Prof. K. K. Gupta	-
11	Srinath K	2013PHXF0105P	Development of Intelligent Pattern Recognition Algorithms for Assessment of Quality of Edible Oils	Prof. Surekha Bhanot	Prof. Panchariya
12	Gorla Praveen	2019PHXF0028P	Resource Provisioning and Management of Smart and Sustainable 5G Small Cells Base Stations	Prof. Vinay Chamola	-
13	Ziyaur Rahman	2017PHXF0416P	Optical Wireless Communication over Fog-Induced Fading: Performance Analysis and Mitigation Techniques	Prof. S. M. Zafaruddin	Prof. V. K. Chaubey
14	Himanshu Purohit	2015PHXF0502P	Person Authentication based on Multimodal Biometric Systems	Prof. Pawan Ajmera	-

15	Sambhavi shukla	2018PHXF0426P	Plasmonic nanostructure based optical sensor for refractive index and thickness sensing	Prof. Pankaj Arora	-
16	Poonam Poonia	2017PHXF0016P	Person authentication based on palm-print recognition	Prof. Pawan Ajmera	-
17	Sankalp paliwal	2018PHXP0434P	Design fabrication and control of a pressure sensor	Prof. Sujan Yenuganti	-
18	Akhilesh Kumar Mishra	2017PHXP0426P	Studies on intelligent controllers for dynamical plants with nonlinear actuators	Prof. Puneet Mishra	Prof. Hitesh Datt Mathur
19	Pranay Bharadwaj	2020PHXF0026P	Analysis and Design of Terahertz Wireless Communication Integrated with Access, IoT, and Cell-Free Networks	Prof. S.M. Zafaruddin	
20	Ashish Kumar Verma	2018PHXF0017P	Investigations on Frequency Selective Reflectors Towards Gain Enhancement of Wideband Planar Compact Antennas	Prof. Rahul Singhal	
21	Radha Bhardwaj	2019PHXP0031P	Development of functionalised 2D nanomaterial based FET sensors system for breath analysis applications	Prof. Arnab Hazra	
22	Suraj Baloda	2018PHXF0445P	Carbon nanomaterial-based flexible pressure/strain sensors for wearable electronics	Prof. Navneet Gupta	Dr. Sumitra Singh
23	Abheek Gupta	2016PHXF0423P	Digital Hardware Implementation for Smart Portable Device for Water Quality Indexing using ANN-based Data Augmentation	Prof. Anu Gupta	Prof. Rajeev Gupta
24	Amit Chougule	2020PHXF0415P	Artificial Intelligence Enabled Vehicular Vision and Service provisioning for Advanced Driver Assistance Systems (ADAS)	Vinay Chamola	
25	Pavitra Sharma	2019PHXF0027P	Design and Development of Energy Management Strategies for Microgrids with Stationary and Mobile Storages	Prof. H.D. Mathur	Prof. Puneet Mishra

Ph.D. thesis submitted (till October 2024)

S.No	Name	ID	Topic	Supervisor	Co-Supervisor
1	Anukaran Khanna	2018PHXF0018P	Nonlinear Control for Low and High Alpha Aircraft Maneuvers under Later Centre of Gravity Uncertainty	Bijoy K Mukherjee	

| 2 | Sisir Kumar Yadav | 2019PHXF0030P | Design and Performance Analysis of Unified Power Quality Conditioner for Power Quality Improvement in Smart Distribution Network | Prof. H.D. Mathur, Prof. Ashish Patel | |

TEACHING/RESEARCH LABORATORIES

S.No	Name of Laboratory	Type of Lab
1	Microelectronics/ VLSI Design Lab (O-Lab)	Teaching and Research
2	Embedded Controller Application Centre	Teaching and Research
3	Virtual Instrumentation Lab	Teaching
4	Instrumentation Technology Lab	Teaching
5	Power Electronics Lab	Teaching and Research
6	Electrical Machines Lab	Teaching
7	Optical and Wireless Communication Lab	Teaching and Research
8	Communication Engineering Lab	Teaching and Research
9	Analog & Digital Electronics Lab	Teaching
10	Nanoelectronics and Device Lab	Teaching and Research
11	IoT and Sensor Lab	Teaching and Research
12	Flexible Electronics Lab	Teaching and Research

VLSI Lab (O-Lab)

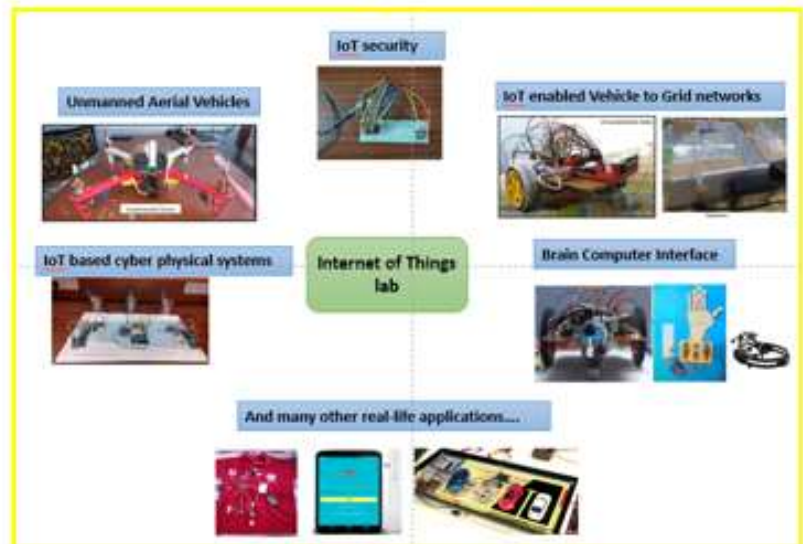**Power Electronics Lab**

Sensor/Device Lab

Electrical Machine Lab

Virtual Instrumentation Lab

For Further Information, Contact

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