



# Department of Electronics and Communication Engineering



Maulana Azad National Institute of Technology Bhopal,  
Bhopal-462003, India



# Vision and Mission of the Department

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## Vision

To produce technical professionals abreast with competencies, mind-set and ethical values synchronous with the futuristic requirements of the globe and to strengthen the national economy. Department will strive to be the cradle for innovations.

## Mission

- To design, develop and implement curricula of various programs using dynamic & responsive processes, in tune with the needs of the global industry and economy.
- To ensure an environment where students, faculty and staff are encouraged to enhance their intellectual curiosity and improve their technical and professional skills through Continuous Development programs.
- To promote reforms in the assessment/ evaluation processes, ensuring reliable, valid, transparent assessment and certification of abilities of learners.



## About the Department

The department was established in 1970. The department has excellent labs and research facilities in VLSI & embedded systems, communication engineering, and signal processing. It currently offers one UG and two PG courses as mentioned below.

<b>Sr. No.</b>	<b>Degree</b>	<b>Specialization</b>	<b>Year of Establishment</b>	<b>Started with</b>	<b>Current Intake (2021)</b>
1	B Tech	Electronics and Communication Engineering (ECE)	1972	16	173
2	M Tech	Digital Communication (DC)	1989	11	21
3	M Tech	VLSI and Embedded Systems (VED)	2006	13	21

Department also offers PhD programme in several relevant research areas.



# Department at a Glance

<b>Faculty</b>	<b>Strength</b>
Professors	09
Associate Professors	02
Assistant Professors	12
<b>Total</b>	<b>23</b>

<b>Staff</b>	<b>Strength</b>
Sr. Superintendent	01
Superintendent	01
Sr. Technician	02
Technician	02
Attendant	03
Computer Operator	01
<b>Total</b>	<b>10</b>

<b>Students</b>	<b>Strength (2021-22)</b>
B Tech	647
M Tech	65
PhD	35
<b>Total</b>	<b>747</b>

<b>Infrastructure</b>	<b>Numbers</b>
Labs	12
Offices	01
Committee Spaces	01
Class Rooms	09 (5 UG + 4 PG)
Dept. Library	01
Faculty rooms/cabins	30

# Faculty Members

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## Professors

Dr. Aditya Goel

Dr. Ajay Somkuwar

Dr. Madhu Shandilya

Dr. R. K. Baghel

Dr. Arvind Rajawat

Dr. Kavita Khare

Dr. Jyoti Singhai

Dr. R. N. Yadav

Dr. J. S. Yadav

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## Associate Professors

Dr. Lalita Gupta

Dr. Dheeraj K. Agrawal

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## Assistant Professors

Dr. Laxmi Kumre

Dr. Sangeea Nakhate

Dr. Alpana Pandey

Dr. Bhavna Shrivastava

Dr. Tarun Kumar Gupta

Dr. D. K. Raghuiwanshi

Dr. Vijayshri Chaurisia

Dr. O. P. Meena

Dr. R. K. Chaurasiya

Dr. Manish Kashyap

Dr. Sukeshini Tirkey

Dr. A Subba Rao

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# Laboratories

Department has total **10** UG and **02** PG Physical Laboratories as mentioned below:

## UG Labs

SN	Lab	SN	Lab
1	Digital Electronics and Microprocessor /Microcontroller Lab	6	Instrumentation and Control Lab
2	Optical Fiber and IC Lab	7	Microwave and Antenna Lab
3	Digital Image Processing Lab	8	Communication Network and Transmission Line Lab
4	Analog and Digital Communication Lab	9	VLSI Lab/Computer Centre
5	Electronic Circuit Lab	10	Project Lab

## PG Labs

SN	Lab	SN	Lab
1	Communication System Design Lab	2	VLSI Design lab (SMDP)

# Research Groups

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## 1. VLSI and Embedded Systems

Low Power VLSI Design

FPGA Based Algorithm Design

RF circuit Design

Device Modeling

High level system design

Nano Technology Circuits

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## 2. Communication System

Optical System Design

Smart Antenna Design

Cognitive Radios

Chaotic Circuits and Chaos

Communication

Neural Network and Its Applications

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## 3. Signal Processing

Digital Image Processing

Speech Processing

Statistical signal processing

Multirate signal processing

Video signal processing

Data Compression

Data Interpretation

Biometric Imaging

Biomedical Signal Processing

ML and Pattern Recognition

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# Department Strength

- Highly experienced faculty. (Average Experience of Faculty members is **22** Years)
- Department has bilateral research collaborations that includes faculty as well as students.
- Quantum number of research and outreach activities by faculty members as mentioned below:

<b>Activity</b>	<b>Number</b>
Research Projects	<b>19</b>
Journal/conference Publications	<b>1164</b>
Book Publications	<b>18</b>
Citations	<b>4958</b>
STTPs/FDPs Organized	<b>97</b>
Conferences/Workshops Organized	<b>23</b>
Patents Published/Granted	<b>12</b>
Expert lectures Delivered	<b>185</b>
Consultancy Undertaken	<b>15</b>

- Department has MoUs with ERICSSON, ESIEE Paris (France), Distributed Artificial Intelligence (DAI) Lab-TU Berlin, National e-Governance Division, Digital India, etc.



# Faculty Profile



SN	Name	Area of Specialization	Publications	PhD Guided	Experience (Years)
1	Dr. Aditya Goel	Optical Communication, Signal Processing etc.	99	12	27
2	Dr. Ajay Somkuwar	Signal Processing, Bio Signal Processing, Statistical Signal Processing	71	04	30
3	Dr. Madhu Shandilya	Image Processing	60	07	30
4	Dr. R. K. Baghel	Low Power VLSI	32	10	28
5	Dr. Arvind Rajawat	Embedded System and VLSI Design	20	04	30
6	Dr. Kavita Khare	VLSI Design	99	17	28
7	Dr. R. N. Yadav	Communication Systems, Neural Network, and Image Processing	74	09	25
8	Dr. Jyoti Singhai	Audio Video & Image Processing	56	14	30
9	Dr. J. S. Yadav	Communication	32	02	25
10	Dr. Dheeraj K. Agarwal	Digital Communication, Image Processing	48	02	17
11	Dr. Lalita Gupta	Signal Processing	30	01	17

# Faculty Profile...

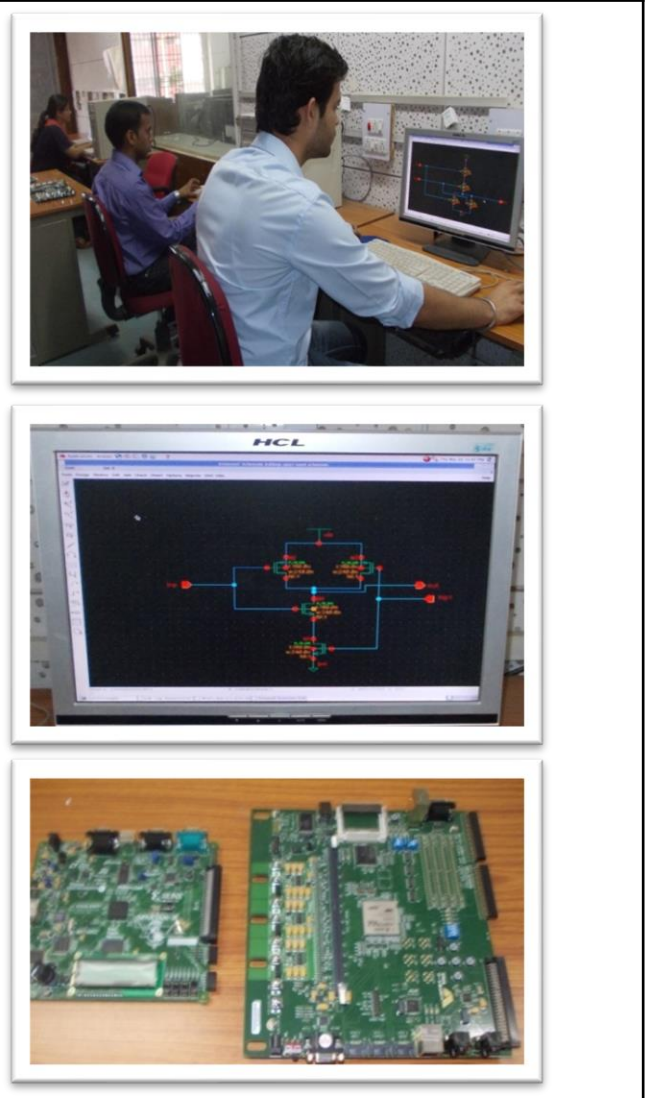


SN	Name	Area of Specialization	Publications	PhD Guided	Experience (Years)
12	Dr. Laxmi Kumre	VLSI and Digital System Design	22	00	20
13	Dr. Sangeea Nakhate	VLSI Design	30	05	25
14	Dr. Alpana Pandey	Digital Communication	15	02	30
15	Dr. Bhavna Shrivastava	VLSI	22	00	17
16	Dr. Tarun Kumar Gupta	VLSI	20	02	19
17	Dr. D. K. Raghuiwanshi	RF, VLSI and Communication	15	00	31
18	Dr. Vijayshri Chaurisia	Image Processing and Analysis	07	03	15
19	Dr. O. P. Meena	Communication Engineering	13	00	12
20	Dr. R. K. Chaurasiya	Machine Learning, Pattern Recognition, Brain-Computer Interfacing	48	01	11
21	Dr. Manish Kashyap	ECE	17	00	03
22	Dr A. Subba Rao	Antennas and MICs, Embedded Systems, Metamaterials	39	00	15
23	Dr. Sukeshni Tirkey	VLSI	15	00	03

# Research Facilities



Device or software	Utilization
Cadence Tools	Design of full-custom integrated circuits: Creation of digital integrated circuits, Simulation and functional verification of RTL including Verilog, VHDL based models, Co-design of integrated circuits and packages.
Synopsys Tools	Frontend and backend VLSI circuit design: Integrated circuit floorplaning and layout designing. Review of waveforms generated from a number of tools, including HSPICE, HSIM, and NanoSim. Synthesizing HDL and Verilog code with timing analysis.
Mentor Graphics Tools	VLSI and Embedded circuit design.
Xilinx Vivado, Xilinx 9.2i with Spartan - 3E and Vertex – II pro	Verification of circuit description in verilog and VHDL.
Microwave benches of X Band	To perform basic experiments of Microwave Engineering
Vector Network Analyzer of Agilent made up to 6 GHz	For Antenna and EM devices Testing and analysis



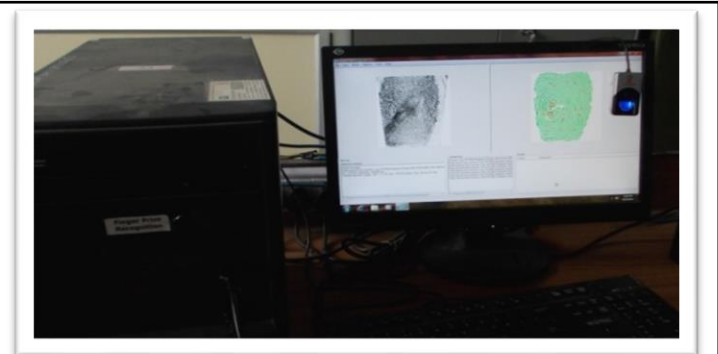
# Research Facilities...

Device or software	Utilization
Optical Fiber System with: <ul style="list-style-type: none"> <li>▪ OTDR Building blocks</li> <li>▪ Laser diode module consisting of LD unit, LD Driver &amp; APD module</li> <li>▪ Fiber Optic Power Meter</li> <li>▪ Fiber Event 500m</li> </ul>	Facilitate to Identify the fault location in an optical network and there by instrumental in troubleshooting. To analyze the various characteristic parameter of single mode fiber there by useful in identification of the fiber for different applications.
Optical Fiber System with: 1310 & 1550nm Laser Diode Module with Glass Fiber, WDM/DWDM Kit/Modules – 4 no, Connectorisation and UV Splicing Kit	To train and demonstrate the UG and PG students the concept of analysis and testing of optical video link, WDM optical system e.t.c.
CADFEKO Electromagnetic Simulator	For simulation of Antenna and other Electromagnetic devices Design and analysis.
IE-3D Antenna Design Simulator	Powerful tool for simulated design of Antenna and other Electromagnetic devices and there analysis.
Visual TCAD Device Simulator	Device and Circuit level Analysis (2D/3D) for electrical and RF parameters
Simulia CST Studio Suite	Electromagnetic analysis package for designing and analyzing antennas and electro magnetic components



# Research Facilities...

Device or software	Utilization
MATLAB with Image processing & Signal Processing Tool Box	For conducting Experiments related to simulation and testing of algorithms in Image processing and DSP labs.
On line Imaging Kit	For testing of algorithm in real time scenario for image processing applications along with 3D imaging techniques.
Optiwave Software	A power simulation software tool to carry out R&D activities in the area of optical communication
IE-3D Antenna Design Simulator	Powerful tool for simulated design of Antenna and other Electromagnetic devices and there analysis.
Biometric Imaging Kits	Students can learn and development new algorithms for Face recognition, finger print recognition, signature Recognition, Iris recognition in real time environment.
LabView Setup	The setup of LabView for Image processing and control system with various sensors for designing of virtual setup of practical system.
Emotive 16 channel EEG Headset with licensed software	Electroencephalogram (EEG) signals can be acquired using non-invasive method.





Thanks