Facilities and Technical Support

1: Adequate and well-equipped laboratories, and technical manpower.

The laboratory setup in the Electronics department is comprehensive and fully equipped to support a wide range of technical disciplines. Each lab is furnished with modern instruments and tools, ensuring that students have access to the latest technologies for practical learning. From Electronic devices, communication engineering, to the design software, every lab is designed to foster innovation and hands-on experimentation. High-quality workstations, simulation software, and industry-standard equipment are available to help students conduct experiments, research, and projects with precision. The labs are continually updated to meet the evolving needs of the engineering field, offering a conducive environment for academic growth and technical expertise. Below is the list of available labs in our department:

Sr. No.	Name of the Laboratory	No. of students per setup (Batch Size)	Name of the Important equipment	Weekly utilization status (all the courses for which the lab is utilized)	Technical Manpower support		
					Name of the technical staff	Designation	Qualification
1	Analog Electronics-I Lab	25	AE Kits	Three days	Mr. Tariq Hussain	T.A.	Diploma E&C
2	Logic Design Lab	25	Digital Design Kits	Three days	Mr. Hanif Khan	S.T.A.	B.E. (E&C)
3	Circuit Simulation Lab	25	SPICE Simulator	Three days	Mr. Hanif Khan / Mr. Abdul Sadir	Lab Attendant	B.E. (E&C)/ Matric
4	Instrumentation Lab	25	1. LVDT systems.	Three days	Mr. Asif Shafi	Technician	Inter

			2. Advanced temperature sensors. 3. Potentiometer error measuring system. 4. Light intensity detection system. 5. Pressure sensors. 6. Strain gauge sensors.				
5	Digital Circuits Lab	25	Digital Design Kits	Three days	Mr. Tariq Hussain	T.A.	Diploma E&C
6	VLSI Lab	25	XILINX, TCAD Simulators (Silvaco, Sentaurus), 20 Computers	Three days	Mr. Hanif Khan	S.T.A	B.E (E&C)
7	AE-II Lab	25	Basic Analog Circuitry/Breadboards/ Kits	Three days	Mr. M Usman	Lab Atten dant	M.Tech. (E&C)
8	Communication Lab	25	1. 1.Basic AM/FM trainer kits. 2. Satellite Communication Trainers. 3. Wireless spectrum analyzer 4. CDMA DSSS trainer Kit. 5. Matlab. 6. Qualnet software. 7. ANSYS tools	Three days	Mr Tariq hussian	T.A.	Diploma E&C
9	DSP Lab	25	Computers loaded with MATLAB, DSP Kits	Three days	Mr Khalid Khan	Lab. Atten dant	DIPLO MA/BE PERSUI NG
10	Microprocessor Lab	25	8051, ARM Kits, Raspberry Pie Pic Daughter Board, Avr Board, Universal Base Board, Xilinx Spartan Kits	Three days	Mr. Haneef Khan	STA	BE (E&C)

11	Microwave Lab	25	Microwave Benches	Three days	Mr M Usman	Lab Atten dant	M. Tech (E&C)

Table B.6.1

Figure 1: VLSI Lab

Figure 2: Communication Engineering Lab (& Digital Circuits lab)

Figure 3: Instrumentation and Sensor Lab

Figure 4: Analog electronics Lab1 (& Microwave Lab)
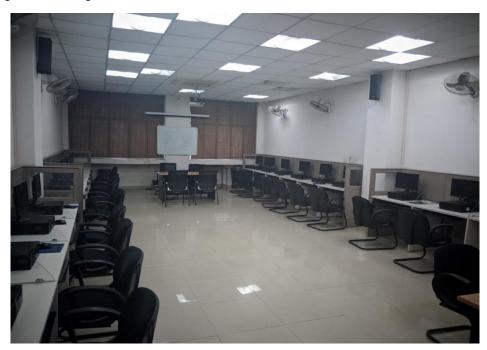
Figure 5: Analog electronics Lab2

Figure 6: Electronic Design Automation Lab (Circuit Simulation Lab) (DSP lab)

Figure 7: Avionic's lab

Figure 8: Microprocessor lab & Logic Design Lab

Figure 9: Optoelectronics and Optical Communication lab

2. Laboratories maintenance and overall ambience
(Self-Explanatory)

Our laboratories are meticulously maintained to ensure both functionality and safety, with careful oversight provided by the Faculty Incharge labs and dedicated lab technicians. Each day, the labs are cleaned by sweepers to maintain a hygienic environment, while the tools and equipment are routinely checked to ensure they are in working order before each session begins. This proactive approach includes frequent inspections of electrical systems, such as electric boards, lighting, and heating points—to prevent potential hazards, including the risk of short-circuiting, which is a common cause of fires. Additionally, all computers and other equipment are properly shut down at the end of each lab session, and any unnecessary devices are disconnected from the power supply to minimize energy waste and avoid overheating. The air conditioning units are also switched off to conserve energy before the lab is vacated.

To ensure a pleasant and conducive atmosphere, computers, kits, and other equipment are cleaned regularly, and room fresheners are sprayed to enhance the lab environment. We also follow a robust Planned Preventive Maintenance (PPM) program, which involves servicing and checking all lab equipment during the summer break by our technical staff. This regular maintenance practice has greatly extended the lifespan and improved the efficiency of our equipment, contributing to a safer and more productive learning space.

3. Safety measures in laboratories

Sr. No.	Name of the Laboratory	Safety measures
1	VLSI Lab	Fire extinguishers, First Aid Kit
2	Microprocessors Lab	Fire extinguishers, First Aid Kit
3	Opto-electronics and Optical Communication Lab	Fire extinguishers, First Aid Kit
4	Analog Electronics Lab	Fire extinguishers, First Aid Kit
5	DSP lab	Fire extinguishers, First Aid Kit
6	Instrumentation Lab	Fire extinguishers, First Aid Kit
7	Digital Design Lab	Fire extinguishers, First Aid Kit
8	Communication Lab	Fire extinguishers, First Aid Kit
9	Microwave lab	Fire extinguishers, First Aid Kit
10	EDA Lab	Fire extinguishers, First Aid Kit

Table B.3

4. Project laboratory
(Facilities & Utilization)

At our institution, each of our laboratories is designed as a specialized project laboratory, focusing on specific research and project work in various domains of electronics and communication. Given the wide range of subfields within this discipline, it would be impractical to house all types of projects under one roof. However, to streamline access and facilitate comprehensive project development, our Electronics Design Automation (EDA) lab is equipped with a diverse suite of all the necessary software for circuit design, simulation, and testing, enabling them to tackle projects that span multiple areas of electronics.

Our department has invested in state-of-the-art laboratory equipment's, to enhance the learning experience and to provide students with hands-on exposure to the latest technologies. Some of the available simulation tools include SILVACO, Sentaurus, MATLAB, Optisystem, PSpice, Xilinx etc.

In addition to the well-established laboratories, there are a lot of new equipment and softwares purchased during the last three years to upgrade the existing labs and to encourage the students to dive more into the recent research areas. These new additions include advanced simulation softwares and high-precision instruments for measurement and testing. Additionally, specialized tools for device and circuit design and simulation have been incorporated to align with emerging industry trends and foster innovation. These new tools ensure that our students have access to cutting-edge resources, enabling them to gain practical skills and stay ahead in their respective fields. We've also upgraded our computer systems with high-performance workstations to support complex engineering applications.

Some of the recent purchases during the assessment year 2021-24 are listed below:

S.No.	Name of the equipment	Year of purchase	Quantity	Amount sanctioned	Type of Purchase
1.	Kit 1: IOT platforms TI-Launchpad (Texas instruments)	2021	10	3,40,010/-	New Tool Research purpose
2.	Kit 2: IOT platforms Atmel Microcontroller	2021	10	3,29,700/-	New Tool Research purpose
3.	**A.** VLSI design software for analog and digital design front end and back end flow **B.** VLSI design simulation at device level: Multiuser	2022	10 licenses 5 licenses	29,67,700/-	New Tool Research purpose
4.	Vivado ML enterprise Edition,Vitis model Composer Plugin, (HDL simulation tool)	2022	25 licences	2,21,500/-	Lab Upgradation VLSI lab

Department of Electronics & Communication Engg.

	University Bundle of 25 licences				
5.	TUL PYNQ- Z2 Boards	2022	10	22,250/-	Lab Upgradation
6.	Pmod TMP3: Digital temperature sensor	2022	10	7000/-	Lab Upgradation
7.	Pmod BT2: Bluetooth interface	2022	10	27000/-	Lab Upgradation
8.	Pmod WiFi: WiFi interface 802.11g	2022	10	24000/-	Lab Upgradation
9.	Pmod GPS: GPS receiver	2022	10	40,000/-	Lab Upgradation
10.	Analog pressure measurement system Trainer Kit	2023	2	78,000/-	Lab Upgradation
11.	Angular displacement kit	2023	2	52,000/-	Lab Upgradation
12.	Strain gauge with cantilever Trainer kit	2023	2	30,000/-	Lab Upgradation
13.	LVDT sensor kit	2023	1	12,000/-	Lab Upgradation
14.	Linear displacement measurement using LDR	2023	1	20,000/-	Lab Upgradation
15.	Light intensity control system	2023	1	27,000/-	Lab Upgradation
16.	DC Servo Motor Position Control Kit	2023	1	25,000/-	Lab Upgradation
17.	Desktop Computer System	2023	3+7	2,40,000/- + 3,50,000/-	Lab Upgradation
18.	4 channel Laser source	2023	1	15,00,000/-	New Tool Research purpose
19.	Spectrophotometer	2024	1	6,00,000/-	New Tool Research purpose
20.	Laser Power meter	2024	1	5,00,000/-	New Tool

					Research purpose
21.	Establishment of semiconductor devices and chip fabrication lab	2024		7,99,997/-	New Lab setup
22.	Desktop Computer System	2024	5	5,01, 500/-	Lab upgradation

A remarkable utilisation of these labs is evident from the quality of the work presented by our students in different sectors. Our B.Tech. Students regularly engage in hands-on project work across these labs, with many of their efforts resulting in innovative and novel solutions. Notably, several B.Tech. projects have led to high-impact journal publications, including contributions to esteemed SCI-indexed journals, book chapters, and leading conferences, with some also earning prestigious awards. The ongoing achievements of our students, reflected in the recent publications and accolades listed below, are a testament to the quality and significance of their work.

S. No.	Name of the students	Title of the project	Type of Publication	Project guide
1.	Dev Chadha (20BEC052)	Engineered gate-based nano scaled JK flip flop: Design, Simulation, and applications	Published in SCI listed journal "Nano: Brief reports and reviews" (2024)	Prof Sajad A Loan
2.	Fiza Moin (20BEC074)	Sensitivity Enhancement in U-Shaped Evanescent Wave Fiber Sensor	Published in SCI listed journal " *IEEE Sensors*" *(2023)*	Prof Mainuddin, Prof M.T. Beg
3.	Akram Afridi	Health monitoring systems	Awarded best healthcare project in "HACKJMI 2023"	Presented at JMI
4	Mudit Wadhwa (19BEC041), Prakhar Mishra (19BEC044) &Puneet Sharma (19BEC045)	New prime number counter: Design and performance analysis using CMOS and carbon nanotubes	Paper presented in the conference "International conference on nanotechnology: opportunities and challenges" Published as conference proceedings in springer materials (SPM,	Dr Imran Ahmed Khan

			volume 28) (2023)	
5.	Owais Ahmad shah, Amrita Rai, Puneet Sharma (19BEC045), Prakhar Mishra (19BEC044) & Satvik Vats	Odd counter: New design and performance analysis using carbon nanotube transistors for high performance applications	Paper presented in "IEEE International conference on computational intelligence and sustainable Engg solutions (CISES). (2023)	Dr Imran Ahmed Khan
6.	Huzaif Malik, Mohammad Sarfaraz Alam and Shairin Meraj	Team name: Heckerpeeps Participated and winner of the Cyber security challenge KAVACH 2023, conducted by the ministry of home affairs and ministry of education, AICTE, BPR&D and Indian cyber-crime coordination centre.	Winner of KAVACH-2023	Presented JMI
7.	Mohammad Sarfaraz Alam	Generalized Frame Consistency video detection on latest T2Vs.	Participated in Viksit Bharat, for contributing ideas towards realizing the vision of Viksit Bharat by 2047.	Prof M T Beg
8.	Fiza Moin (20BEC074)	U-Bent Plastic Optical Fiber Sensor for Iron in Iron Supplements	Published in SCI listed journal " *IEEE Sensors" (2022)*	Prof Mainuddin, Prof M.T. Beg
9.	Akram Afridi	Team name: XLR8 Team id: 22020	Participation certificate in SAE northern India section EFFI-CYCLE 2022 hosted at Lovely Professional University, Punjab, November 2022.	Presented JMI