Research Projects

Name of the Investigator	Title of the project and duration	Funding Agency	Amount sanctioned in Rs	Year
Prof Mainuddin and Prof. M.T.Beg	Feasibility study and demonstration of optical sensors for water pollutants (LSRB393)	Life Science Research Board (LSRB), DRDO, Delhi	Rs 93.75 Lakhs	2022-2025
D/O ECE	Project Sponsored under PURSE	DST	97 Lakhs	2017-2022
Dr. Md. Waseem Akram	Design and Simulation of Junctionless transistor based on SELBOX technology	UGC	10 Lakhs	2018-2020
Dr. S. Intekhab Amin	Design Considerations and Performance Assessment of Tunnel FET based Dielectrically Modulated Biosensor Device	UGC Start-up Grant under the MHRD/UGC - Empowered Committee's Basic Science Research (BSR) Program	10 Lakhs	2018-2020
Prof. Sajad Ahmad Loan	Modernization of VLSI and Nanoelectronics Lab, JMI New Delhi	AICTE	7 Lakhs	2013-2014
Prof. Mirza Tariq Beg	1. Modernization of Microprocessor laboratory 2. Modernization of Faculty Library	1. MHRD 2. MHRD	1. 10 Lakhs 2. 15 Lakhs	1993-1995

List of Patents Filled/Submitted/ Granted

Sl. No.	Patent Application No.	Status of Patent (Published / Granted)	Inventor/s Name	Title of the Patent	Applicant/s Name	Patent Filed Date (DD/MM/ YYYY)	Patent Published Date / Granted Date (DD/MM/YYYY)	Patent Publication Number / Patent Granted Number	Assignee/s Name (Institute Affiliation/s at time of Application)	Here, attach Source Proof Screenshots/URL/ Website Links, etc.
1	202111030290	Granted	Mainuddin, Mohd Ashraf, Fiza Moin	Optical fiber-based iron detection and quantification sensor	Mainuddin, Mohd Ashraf, Fiza Moin	06/07/2021	09/08/2023	444002	Jamia Millia Islamia, New Delhi	**https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus**
2	202311079994	Filed	Loan, Sajad A and Nigar; H.	A Uni-gate Vertical Power MOSFET With Record High Balliga's Figure-of-Merit, a method of manufacturing the same	Loan, Sajad A and Nigar; H.	24/11/2023	-	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
3	201911005967	Granted	Mirza Tariq Beg, Binod k. Kanaujia, Aijaz mehdizaidi, Kunal Srivastava, Sarita	A Compact HEXA-BAND thereof	Mirza Tariq Beg, Binod k. Kanaujia, Aijaz mehdizaidi, Kunal Srivastava, Sarita	15/02/2019	12/12/2023	481258	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
4	201911008499	Granted	Sajad a loan, Hafsa Nigar, Abdul g Alharbi	Selective buried double gate power MOSFET: a method of manufacturing the same	Sajad a loan, Hafsa Nigar, Abdul g Alharbi	05/03/2019	15/05/2024	538143	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
5	201911005968	Granted	Mirza Tariq Beg, Binod k., Kanaujia, Aijaz mehdizaidi, Kunal Srivastava et al.	A Dual Band quadrature Branch Line Coupler With Wide Frequency Ratio	Mirza Tariq Beg, Binod k., Kanaujia, Aijaz mehdizaidi, Kunal Srivastava et al.	15/02/2019	19/04/2023	429290	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus

6	201711041136	Granted	Sunil Kumar, Sajad A loan, Abdullah Alharbi	Patterned gate electrode for implementing any Boolean equation and method for implementing the same	Sunil Kumar, Sajad A loan, Abdullah Alharbi	17/11/2017	15/03/2024	526937	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
7	2743/DEL/2015	Granted	Sajad A loan, Sunil Kumar	A novel metal source/drain Schottky device based digital circuit designing	Sajad A loan, Sunil Kumar	01/09/15	05/12/2023	477215	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
8	202031033150	Granted	Dr. M. Nizamuddin et. Al.	A System For Wirelessly Monitoring Water Level In a Water Tank and Method Thereof	Dr. M. Nizamuddin et. Al.	03/08/2020	22/03/2024	529897	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
9	201611018596	Granted	Sajad A. Loan	Polarization engineered enhancement mode III-V group based devices	Sajad A. Loan	31/05/2016	04/01/2024	494485	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
10	DE202022105565	Published	Imran A. khan et al	Smart Inhalers for Asthmatics	Imran A. khan et al	30/09/2022	14/10/2022	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
11	202211024045	Published	Parikshit Vasisht, Moinuddin, Taruna Sharma, Munish, vashishath,Amber khan	Versatile ultra-wideband radio sensor for early stage detection of breast cancer	Apeejay Stya University	24/04/2022	29/04/2022	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus

12	201911043898	Granted	Mirza Tariq Beg, Binod k. Kanaujia, Aijaz Mehdi Zaidi, Deepti Sharma, Sarita	A microstrip dual band out of phase power divider having high power handling capability	Mirza Tariq Beg, Binod k. Kanaujia, Aijaz Mehdi Zaidi, Deepti Sharma, Sarita	30/10/2019	15/09/2022	406693	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
13	202211024046	Published	Amber khan, Parikshit vasisht, Moinuddin, Taruna Sharma, Munish Vashishath, Amber khan	Compact elliptical-patch antenna for early detection of breast cancer with high mammographic density	Apeejay Stya University	24/04/2022	29/04/2022	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
14	202111050241	Published	Sajad A. Loan, Sumit Verma, Hend I. Alkhammash	Polarization doped enhancement mode p-type GAN (PD-GAN) MOSFET: a method of manufacturing the same	Sajad A. Loan, Sumit Verma, Hend I. Alkhammash	02/11/2021	02/06/2023	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
15	201811019576	Published	Sajad a. Loan, M. Ehteshamuddin	Planar junctionless transistor with buried metal layer a method of manufacturing the same	Sajad a. Loan, M. Ehteshamuddin	25/05/2018	Publication: 29/11/2019 FER Date 26/05/2021	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus

16	202311079994	Filed	Loan, Sajad A, and Nigar; H	A Uni-gate Vertical Power MOSFET With Record High Balliga's Figure-of Merit, a method of manufacturing the same	Loan, Sajad A, and Nigar; H	24/11/2023	-	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
17	201911008491	Published	Mohd Rizwanuddin Shaikh, Sajad A. loan	Drain engineered TEFT with fully suppressed ambipolarity: a method of manufacturing the same	Mohd Rizwanuddin Shaikh, Sajad A. loan	05/03/2019	21/01/2025	558375	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
18	202411057580	Filed	Shams Ul Haq, Tabassum Khurshid and Sajad A. Loan	Buffer-based single-ended ternary SRAM cell	Shams Ul Haq, Tabassum Khurshid and Sajad A. Loan	30/07/2024	--	--	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
19	202411057579	Filed	Shams Ul Haq, Tabassum Khurshid and Sajad A. Loan	Energy efficient 3:1 ternary Multiplexer	Shams Ul Haq, Tabassum Khurshid and Sajad A. Loan	30/07/2024	--	--	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus

20	202311037711	Published	M. Nizamuddin et al.	High gain, low power triple cascode operational transconductance amplifier using carbon nanotube field effect transistor	Integral university	01/06/2023	14/07/2023	--	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
21	202311061483	Published	M. Nizamuddin et al.	Graphene nanoribbon field effect transistor based operational traconductance amplifier with high slew rate for bio-signal	Integral university	13/09/2023	13/10/2023	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
22	202311063419	Published	M. Nizamuddin et al.	Efficient, ultra-low power instrumentation amplifier based on carbon nanotube field effect transistors	Integral university	21/09/2023	13/10/2023	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PublicSearch/PublicationSearch/ApplicationStatus
23	202411083285	Published	M. Nizamuddin et al.	CMOS based operational amplifier with improved gain and bandwidth using triple cascode operational transconductance amplifier	Integral university	30/10/2024	13/12/2024	-	Jamia Millia Islamia, New Delhi	https://iprsearch.ipindia.gov.in/PatentSearch/PatentSearch/ViewApplication Status

Product Development:

PhD, M. Tech. and even B. Tech. students work and research in various areas of electronics and communication engineering. In the area of VLSI students have designed various ASICs, in the area of Microwave and Antenna students have developed various working prototypes of antennae, and in the area of analog signal processing many circuits have been developed using commercially available ICs such as AD844, CA3080 etc.

Research Laboratories:

1. VLSI Design Lab

In VLSI lab, we train the students on the use of Hardware description languages. The tool/software used for this is Xilinx. Any HDL is used to describe hardware for a complicated system. In VLSI lab we introduce the students to VHDL language, used to describe a digital system. The students are told about various design units and modelling styles used in VHDL.

In this lab, the students are made to implement the various logic gates, verify their

truth table and implement Boolean functions using gates. Additionally, we also implement half adder, half subtractor, full adder, full subtractor circuit using logic gates. We also realize single bit comparator, multiplexer, digital-to-analog converter, SR latch, and flip-flops in this lab. Finally, the broad objective of the lab is to enable the student to do the programming of an FPGA and CPLD.

In addition to this PhD students are also working in this laboratory on various research areas namely, Low Power Device Designing, Wide Bandgap Semiconductor based devices, VLSI design, Circuit Designing and Nanoelectronics and Devices using the tools namely, ATLAS TCAD Device Simulator, Sentaurus TCAD Device Simulator and HSpice.

2. Optoelectronics and Optical Communication Lab

Aim of this lab is to give training in terms of handling of optical fibers, characterizing them and developing an understanding, which is to embark on advanced work in fiber optics and related areas like optical sensors.

List of experiments:
  i.   Fiber end preparation and light coupling
  ii. Numerical aperture measurement
  iii. Micro bending loss and application in sensing
  iv. Mode field diameter of a single mode fiber
  v.   Refractive index profile of a multimode fiber

In addition to basic experiments mentioned above, depending on the level of students, students are allowed to float several minor and major projects in the area of fiber optics.

For research work, the software used in lab is Optisystem 15. Optisystem is a comprehensive software design suite that enables users to plan, test, and simulate optical links in the transmission layer of modern optical networks.

3. **Analog Signal Processing Lab**

   This lab is introduced to improve the understanding of basic analog signal processing/generation circuits. Applications of active building blocks such as Op- Amp, OTA, and CFOA as filters, oscillators and amplifiers are analyzed using hardware and corresponding results are verified using OrCAD PSpice software. The goal of this lab is to develop the practical concepts underlying filters and amplifiers in an intuitive manner, such that the students can thoroughly understand applications of analog integrated circuits as well as filter design and in generation of signals.

   In addition to this, the lab is well equipped to cater the research needs of PhD students working in the area of analog signal processing. The published research work of scholars is also available in the laboratory.

4. **Instrumentation and Sensors Lab**

   In this lab students are exposed to various electrical instruments like strain gauge, potentiometer, ohmmeter, Anderson's bridge, Maxwell's bridge, LVDT, CRO etc. They learn the working of above stated instruments. Some of the experiments are performed on breadboard with the help of components like resistors, inductors and capacitors. The main aim of lab is to relate the theoretical concepts with the instruments' working.

   In addition to this research is being carried out by research scholars in the area of Wireless Sensor Networks using Wireless Flood Monitoring System Kit and MATLAB software in the Laboratory.

5. **Advanced Communication Lab**

   The communication laboratory is well equipped with analog communication kits such as amplitude modulation and demodulation, phase modulation and demodulation, frequency modulation and demodulation, noise generator and digital communication kits like PCM, DM, PPM, ADM, ASK, FSK, PSK, QAM.

   Students also carry out the study of GPS transponder, mobile communication, GSM using various kits in the laboratory.

   In addition to this research is being carried out in the area of mobile communication, MAC Layer Protocol designing, Antenna designing using QualNet, MATLAB and HFSS softwares.