





POST GRADUATE DEPARTMENT OF  
ELECTRONICS, UNIVERSITY OF JAMMU

WELCOMES

STUDENTS & STAFF MEMBERS OF  
JAWAHAR NAVODHYA VIDYALAYA,  
GHAROTA ON EXPOSURE VISIT









**DEPARTMENT OF ELECTRONICS**

University of Jammu, Jammu

in collaboration with

**IEEE-ELECTRON DEVICE SOCIETY-DELHI CHAPTER**

Jointly organize

**ONE DAY MINI COLLOQUIUM ON**

**"LATEST ADVANCES IN ELECTRONIC DEVICES AND CIRCUITS"**

on November 30, 2023



**IEEE**  
ELECTRON DEVICE SOCIETY

**75<sup>TH</sup>**  
ANNIVERSARY | TRANSISTOR

**DEPARTMENT OF ELECTRONICS**  
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on No. 23







अकारवाणी

# एफ एम ट्रांसमीटर केन्द्र FM TRANSMITTER CENTRE







प्रसार भारती  
भारत का लोक सेवा प्रसारक  
आकाशवाणी जम्मू  
स्टूडियो परिसर

PRASAR BHARATI  
INDIA'S PUBLIC SERVICE BROADCASTER  
ALL INDIA RADIO JAMMU  
STUDIO COMPLEX





# DEPARTMENT OF ELECTRONICS UNIVERSITY OF JAMMU

### Post Graduate Department of Electronics University of Jammu

#### Semiconductor Device Fabrication and Characterization

**INTRODUCTION**  
A semiconductor device is a device that can conduct or block the flow of electric current. It is made of a material that has a band gap between the valence band and the conduction band. The width of the band gap determines the electrical properties of the material. Semiconductors are used in a wide variety of electronic devices, including diodes, transistors, and integrated circuits.

**Fabrication of CMOS Gate Stacks**  
CMOS (Complementary Metal-Oxide-Semiconductor) technology is the most widely used semiconductor technology. It consists of two types of transistors, PMOS and NMOS, connected in a complementary configuration. The fabrication of CMOS gate stacks involves several steps, including substrate preparation, oxide growth, lithography, and etching.

**COMPARISON OF FABRICATED GATE STACKS AT DIFFERENT VOLTAGES**

Parameter	10V	20V	30V	40V
Gate Length (nm)	100	100	100	100
Gate Width (nm)	100	100	100	100
Gate Thickness (nm)	100	100	100	100
Gate Area (nm <sup>2</sup> )	10000	10000	10000	10000
Gate Perimeter (nm)	1000	1000	1000	1000

**PHYSICAL CHARACTERIZATION**  
The physical characteristics of the fabricated gate stacks were studied using scanning electron microscopy (SEM) and atomic force microscopy (AFM). The SEM images show the overall structure of the gate stacks, while the AFM images provide a detailed view of the surface morphology. The results show that the fabricated gate stacks have a smooth surface and well-defined edges.

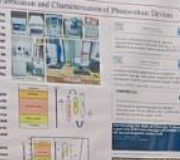
### Opto-Electronics & Microelectronics Research Group Department of Electronics University of Jammu

Faculty: Prof. Subodh Kumar, Dr. Rakesh Kumar


#### Opto-Electronics: Simulation, Fabrication and Characterization of Photodiode Device

Photodiodes are semiconductor devices that convert light into electrical current. They are used in a wide variety of applications, including optical communication, light detection, and imaging. The simulation, fabrication, and characterization of photodiode devices are discussed in this paper.


**Simulation**  
The photodiode device was simulated using Silvaco TCAD. The simulation results show that the device has a high quantum efficiency and a low dark current. The device structure and parameters are shown in the figure below.



**Fabrication**  
The photodiode device was fabricated using a standard CMOS process. The device structure is shown in the figure below.



**Characterization**  
The photodiode device was characterized using a Keithley 640 digital multimeter. The results show that the device has a high quantum efficiency and a low dark current. The device characteristics are shown in the figure below.



### FACULTY PROFILE Department of Electronics Dr. Parveen Kumar Lakshana

Dr. Parveen Kumar Lakshana is an Assistant Professor in the Department of Electronics, University of Jammu. She has a Ph.D. in Electronics and Communication Engineering from the University of Jammu. She has been teaching in the Department of Electronics since 2010. She has published several research papers in international journals and conferences. She is also a member of the Indian Institute of Engineers (IIE) and the Indian Society for Technical Education (ISTE).

### Books Published

1. "Microelectronics: Simulation, Fabrication and Characterization of Photodiode Device" (2020)

### Radio & TV Interviews

1. "Microelectronics: Simulation, Fabrication and Characterization of Photodiode Device" (2020)

### Department of Electronics University of Jammu

#### BEST PRACTICES

The Department of Electronics, University of Jammu, has implemented several best practices to enhance the quality of education and research. These practices include:

- Regular faculty development programs and workshops.
- Encouraging faculty to publish research papers in international journals and conferences.
- Providing state-of-the-art laboratory facilities and equipment.
- Organizing seminars, workshops, and guest lectures by industry experts.
- Implementing a strict quality assurance system for all academic and administrative activities.







# DEPARTMENT OF ELECTRONICS UNIVERSITY OF JAMMU

CLUSTER UNIVERSITY JAMMU

DIGITAL  
CLUSTER UNIV

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### First Year B.Tech. Department of Electronics UNIVERSITY OF JAMMU

#### Introduction to Electronics and Characterization

Introduction to the field of electronics, covering the basic components, circuits, and their applications. This section includes a detailed overview of the course structure and the various projects and experiments conducted throughout the year.

Sl. No.	Name of the Student	Project Title	Grade
1	Arjun Singh	Design and Simulation of a Full-Wave Rectifier	A
2	Divyanshu Sharma	Design and Simulation of a Class-D Amplifier	B
3	Harshita Kaur	Design and Simulation of a Voltage Regulator	C
4	Rishabh Gupta	Design and Simulation of a Power Supply	D
5	Siddhant Singh	Design and Simulation of a Filter	E

### Opto-Electronics & Microelectronics Research Group Department of Electronics University of Jammu, Jammu

#### Photoconductive Cell Based Photo Diode Array

This project focuses on the design and simulation of a photoconductive cell based photo diode array. It details the selection of materials, the design of the array, and the simulation results showing its response to light intensity.

#### Opto-Electronic Simulation, Fabrication and Characterization of Photovoltaic Devices

This section describes the simulation, fabrication, and characterization of photovoltaic devices. It includes a detailed description of the device structure, the simulation setup, and the characterization results, such as the I-V characteristics and the power conversion efficiency.

### FACULTY PROFILE Department of Electronics Dr Parveen Kumar Lehana

Sl. No.	Name	Qualification	Experience
1	Dr. Parveen Kumar Lehana	Ph.D. (Electronics), M.Tech. (Electronics), B.Tech. (Electronics)	15 Years
2	Dr. Anshu Singh	M.Tech. (Electronics), B.Tech. (Electronics)	10 Years
3	Dr. Rishabh Gupta	M.Tech. (Electronics), B.Tech. (Electronics)	8 Years
4	Dr. Siddhant Singh	M.Tech. (Electronics), B.Tech. (Electronics)	5 Years

#### Books Published

- 1. Design and Simulation of a Full-Wave Rectifier (2020)
- 2. Design and Simulation of a Class-D Amplifier (2021)
- 3. Design and Simulation of a Voltage Regulator (2022)
- 4. Design and Simulation of a Power Supply (2023)
- 5. Design and Simulation of a Filter (2024)

#### Radio & Tv Interviews

- 1. Interview on the Design and Simulation of a Full-Wave Rectifier (2020)
- 2. Interview on the Design and Simulation of a Class-D Amplifier (2021)
- 3. Interview on the Design and Simulation of a Voltage Regulator (2022)
- 4. Interview on the Design and Simulation of a Power Supply (2023)
- 5. Interview on the Design and Simulation of a Filter (2024)

#### Awards

- 1. Best Project Award (2020)
- 2. Best Paper Award (2021)
- 3. Best Student Award (2022)
- 4. Best Researcher Award (2023)
- 5. Best Innovator Award (2024)





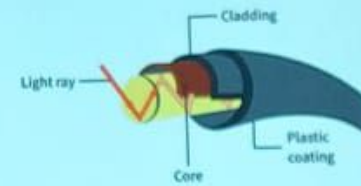
# CAREERS AND SCOPE IN VLSI

Dr. Jasdeep Dhanoo  
Professor and Head (second Term)  
Department of Electronics and Communication Engineering  
Training and Placement Officer  
former Dean-Academic, (2012-21)  
Indira Gandhi Delhi Technical University for Women  
(Govt of NCT of Delhi), Kashmiri Gate, Delhi 06



Invited Talk, Jammu University, Jammu 4 March 2024

## Design of Optical Fiber Sensors



**Prof. Mainuddin**

Department of Electronics and Communication Engineering  
Faculty of Engineering and Technology  
Jamia Millia Islamia, New Delhi-110025

3/4/2024

Dept. of E&C Engineering; JMI