

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

Department of Electronics and Communication Engineering

Annual Report (2022–2023)

It gives me immense pleasure to present the annual report of the Department of Electronics and Communication Engineering for the academic year 2022–2023. The department has continued to strive for excellence in academic, research, and professional domains, while fostering a spirit of innovation, collaboration, and lifelong learning.

This academic year has witnessed noteworthy accomplishments by our faculty and staff. **One of our faculty member have successfully completed his Ph.D. degree**, adding to the department's growing pool of doctorates. This achievement significantly enhances our research capabilities and contributes to the overall academic strength of the department. Furthermore, **Two of our non-teaching staff members** have successfully upgraded their qualifications by pursuing higher education in relevant fields, thereby improving their technical proficiency and support for laboratory and departmental activities.

A proud moment for the department was the recognition of **five senior faculty members** who completed **15 years of dedicated service** to the institution. Their unwavering commitment, experience, and consistent contribution have been instrumental in shaping the department's growth over the years. They continue to serve as mentors and role models for both junior faculty and students alike.

The department has also made commendable progress in research and innovation. **Sixty research papers** were published by our faculty members in reputed national and international journals and conferences. These publications cover a wide range of emerging areas in Electronics and Communication, such as VLSI design, signal processing, embedded systems, and wireless communication. Additionally, **Two patents** were filed during this academic year, reflecting the department's focus on practical, real-world solutions and technology development.

We also take pride in the strong student-faculty engagement through project-based learning, workshops, technical events, and participation in professional society activities such as IEEE and IETE. These initiatives have contributed to creating a vibrant academic culture within the department.

In conclusion, the academic year 2022–2023 has been a fruitful one, marked by progress, recognition, and dedication. The department remains committed to advancing knowledge, encouraging innovation, and fostering a nurturing environment for both students and faculty to grow. We look forward to continued achievements in the years ahead.

Prof. Sunil Kumar
(HOD, ECE)

Name of faculty who qualified Ph.D					
S. No	Faculty Name	Topic	University	Guide Name	Date of Award
1	Dr. Umesh Ch. Singh	Design and Analysis of Substrate Integrated Waveguide Components	Gautam Buddha University		

Name of Staff who enhanced their qualifications from ECE department.				
S.No	Name		Qualified	Uni/Collage
1	Mr. Gajender Singh		MCA	JECRC University , Jaipur
2	Mr. Ram Mishra		BCA	Swami VivekanandSubharti University, Meerut

Name of faculty who enhanced their qualifications with additional courses.					
S.No	Faculty name	Name of the course	Duration of Course	Remarks	FDP Certificate
1	Dr. Rajni	An Introduction to AI	12 Weeks	Top 5% (Elite)	Yes
		Introduction to Machine Learning	12 Weeks	Top 2% (Elite + Silver)	Yes
		Deep Learning	12 Weeks	Top 1% (Elite + Gold)	Yes
		Python for Data science	4 Weeks	Elite	
2	Mr. Ajay Kumar Gupta	Introduction to Machine Learning	12 Weeks	Top 1% (Elite + Silver)	Yes
		Deep Learning	12 Weeks	Top 2%(Elite + Silver)	Yes
		Python for Data Science	4 Weeks	Top 2%(Elite + Silver)	Yes
3	Ms. Kanika Agarwal	Deep Learning	12 Weeks	Top 1% (Elite + Gold)	Yes
		Introduction to Machine Learning	12 Weeks	Elite	Yes
		Python for Data Science	4 Weeks	Elite	Yes
4	Dr. Divya Goyal	An Introduction to AI	12 Weeks		Yes
		Introduction to Machine Learning	12 Weeks		Yes
		Deep Learning	12 Weeks	Elite	Yes

5	Mr. Amit Saxena	Blockchain and its application	12 Weeks	Elite	Yes
6	Mr. Umesh Singh	Python for Data science	4 Weeks		Yes
7	Ms. Sumedha Gupta	Introduction to Machine Learning	12 Weeks	Elite	Yes
8	Dr. Anubha Goel	Deep Learning	12 Weeks		Yes

Journals				
S.No	Name of Faculty	Number	Title	Date
1	Mr. Ajay Kumar Gupta	1	"A Comprehensive Pricing-Based Scheme for Charging of Electric Vehicles," in IEEE Systems Journal, doi: 10.1109/JSYST.2023.3286902. Print ISSN: 1932-8184, Electronic ISSN: 1937-9234	04-07-2023
2	Ms. Shalu Jindal	1	S.Garg, J.Kaur,A.Goel, S.Haldar and R.S.Gupta"Physics based analytical modeling and simulation of Cylindrical Junctions Nanowire Ferroelectric field effect transistor(CJNFe-FET) for enhanced analog performance' Microsystem Technology, 2023 https:// doi.org/10.1007/s00542-023-05468-z	
3	Ms Preeti Goyal	1	Preeti Goyal,Garima Srivastava, Jaya Madan and R.S.Gupta"Performance investigation of hetero gate dielectric DGTfET with drain pocket for analog/RF applicatio"Materials Today:Proceedings,Science Direct,2214-7853/ copy right-2022,dio.org/10.1016/j.matpr.2022.08.195	
4	Dr. Anubha Goyal	1	Swati Sharma, Anubha Goel, Sonam Rewari, Vandana Nath and R. S. Gupta "Characterisation and Analysis of Schottky-Tube FET exhibiting Superior Characteristic Parameters," Arabian Journal for Science and Engineering (Springer), vol. 48, issue:1, pp.: 907-917 ., (Print ISSN: 2193-567X, Online ISSN: 2191-4281, Digital Object Identifier: http://doi.org/10.1007/s13369-022-07200-x , Impact Factor: 2.9).	Sep-22
		2	Neeraj, Shobha Sharma, Anubha Goel, Sonam Rewari & R. S. Gupta. "Temperature sensitive Analytical Analysis of Gate - Stack DM Nanowire FET(4H-SiC)" International Journal of Numerical Modelling: Electronic Networks, Devices and Fields-John Wiley and Sons, Ltd, vol. 36 , Issue:4 , pp. 3065 , September 2022. (Online ISSN: 1099-1204, Digital Object	Sept.2022

			Identifier: http://doi.org/10.1002/jnm.3065 , Impact Factor: 1.6).	
		3	Prajvi Udar, Anubha Goel and R. S. Gupta, "Quantum Effect dependent modelling of Short Channel Junctionless Double Gate Stack (SC-JL-DG) MOSFET for Analog Applications" Microelectronics Journal (Elsevier), vol. 134, pp. 105726, (Online ISSN: 0026- 2692, Digital Object Identifier: https://doi.org/10.1016/j.mejo.2023.105726 , Impact Factor:	Apr-23
		4	Shalu Garg, Jasdeep Kaur, Anubha Goel , Subhasis Halder and R. S. Gupta, "Physics based analytical modeling and simulation of Cylindrical Junctionless Nanowire Ferroelectric Field Effect Transistor (CJNFe- FET) for enhanced analog performance" Microsystem Technologies (Springer), vol. , pp.:1-13, May 2023. (Online ISSN: 1432-1858, Digital Object Identifier: 10.1007/s00542-023-05468-z, Impact Factor: 2.012).	
		5	Neeraj, Shobha Sharma, Anubha Goel, Sonam Rewari & R. S. Gupta. "Improved analog and AC performance for High Frequency Linearity based Applications using Gate - Stack Dual Metal (DM) Nanowire FET (4H-SiC)" Microsystem Technologies (Springer), vol. , no. , pp. 1-14, (Online ISSN: 1432-1858, Digital Object Identifier: https://doi.org/10.1007/s00542-023-05480-3 , Impact Factor: 2.012).	Jun-23
5	Ms. Neeraj	1	Neeraj, Goel A, Sharma S, Rewari S, Gupta RS." Improved Analog and AC performance for High Frequency Linearity based Applications using Gate - Stack Dual Metal (DM) Nanowire (NW) FET (4H-SiC)," Microsyst Technol, 2023.	
6	Mr. Amit Saxena	1	Amit Saxena , Manoj Kumar , R.K.Sharma and R.S.Gupta"Small signal model parameter extraction for cylindrical silicon-on-insulator Schottky barrier MOSFET" Journal of Microsystem Technologies of Springer - Nature(SCI-IF=2.012)	
		3	Jitender Lather, Satvir Deswal, Amit Saxena and R.S.Gupta"Extraction of non-quasi-static model parameters for cylindrical gatestacked junction-less accumulation mode MOSFET and its implementation as RF filters for circuit applications"Journal of Microsystem	

			Technologies of Springer-Nature(Sci-IF=2.012.	
7	Mr. Sudarshan Kumar	1	S.Kumar and A.De, "Design and Mode Matvhing Analysis of stepped substrate integrated waveguide and filters"IETE Journal of Research https://doi.org/10.1080/03772063.203.2171917 ,	
8	Ms. Kanika Agarwal	1	Lp minimization in sparse array Beamforming using Semidefinite Relaxation,International Journal of Electronics , Taylor and Francis., DOI: 10.1080/21681724.2023.2251766	
9	Dr. Rajni	1	Lp minimization in sparse array Beamforming using Semidefinite Relaxation,International Journal of Electronics , Taylor and Francis.,DOI: 10.1080/21681724.2023.2251766	
10	Dr. Umesh Ch. Singh	1	Umesh C.Singh ,Rajesh Mishra "Design and Analysis of step Sized Substrate Integrated Waveguide and Antenna "International Journal on Communication Antenna and Propagation(I.Re.C.A.P)Vol.12N.4 ISSN 2039-5086	Aug.2022
		2	Umesh Singh, Rajesh Mishra "A Dual-Band High -Gain Substrate Integrated Waveguide Slot Antenna For 5G Application " Progress in Electromagnetics Reserch C, Vol.119,191-200,2022	2022
11	Ms.Sumedha Gupta	1	Analytical model for junctionless accumulation-mode cylindrical surrounding gate (JAM-CSG)MOSFET as a biosensor	06-01-2023
		2	Modeling of Dual-Metal Junctionless Accumulation -Mode cylindrical surrounding gate(DM-JAM-CSG) MOSFET for cryogenic temperature applications	19-06-2023
12	Mr. Vaibhav Nijhawan	1	Pawan Kumar,Prabhat, Vaibhav, Harsh"Design and Implementation of Gesture Controlled Car with Arduino Nano Board" ,20th FLAME 2022,Springer , Aug.2023,doi.org/10.1007/978-981-99-3033-3_39	

List of publications from August 2022 to August 2023 of Faculty and staff.				
Conferences				
S.No	Name of Faculty	Number	Title	Date
1	Dr. Anubha Goyal	1	“High K Spacer Gate Stack Engineered, Dual Metal Underlap Junction less GaN Gate All Around (HKS GSE DMUL JGaNGAA) MOSFET for High Frequency Applications”, Anubha Goel and R. S. Gupta, 19th IEEE India Council International Conference; Indicon-2022 on “Transformation of Future Through Interdisciplinary Research and Smart Technologies”, held during 24-26 Nov, 2022 in Cochin University of Science and Technology, Kochi, Kerala, India. (ISBN: 978-1-6654-5272-4 ,pp.: 1-7, Digital Object Identifier: 10.1109/INDICON56171.2022.10039963)	
		2	“Temperature Sensitive analysis of Junctionless Nanowire Ferroelectric Field Effect Transistor (JNFe- FET) for Enhanced Analog Performance”, Shalu Garg, Jasdeep Kaur, Anubha Goel,Subhasis Halder and R. S. Gupta, 5th International Conference 2023: Devices for IntegratedCircuit (DevIC) held during 7-8th April 2023, in Kalyani Government Engineering College, Kolkata, West Bengal, India, organized by IEEE KGEC Student Branch Chapter in associationwith Department of ECE, KGEC and with technical partnership from IETE Kolkata Chapter and IEEE EDS Kolkata Chapter. (ISBN: 979-8-3503-4727-2 ,pp.: 425-429 , Digital ObjectIdentifier: 10.1109/DevIC57758.2023.10134966)	
		3	“Phase Transition Material Modulated Hyper-FET For Digital Applications”, Ritika Sorot,Anubha Goel and Sonam Rewari, 5th International Conference 2023: Devices for Integrated Circuit (DevIC) held during 7-8th April 2023, in Kalyani Government Engineering College,Kolkata, West Bengal, India, organized by IEEE KGEC Student Branch Chapter in associationwith Department of ECE, KGEC and with technical partnership from IETE Kolkata Chapter andIEEE EDS Kolkata Chapter. (ISBN: 979-8-3503-4727-2,pp.:261-265,Digital Object Identifier: 10.1109/DevIC57758.2023.10134819)	

		3	“Phase Transition Material Modulated Hyper-FET For Digital Applications”, Ritika Sorot, Anubha Goel and Sonam Rewari, 5th International Conference 2023: Devices for Integrated Circuit (DevIC) held during 7-8th April 2023, in Kalyani Government Engineering College, Kolkata, West Bengal, India, organized by IEEE KGEC Student Branch Chapter in association with Department of ECE, KGEC and with technical partnership from IETE Kolkata Chapter and IEEE EDS Kolkata Chapter. (ISBN: 979-8-3503-4727-2, pp.:261-265, Digital Object Identifier: 10.1109/DevIC57758.2023.10134819)	
		2	“Impact of Interface Trap Charges on Noise and Electrical Properties of 4H-SiC Based Gate-Stack, Dual Metal, Surrounding Gate, FET(4H-SiC-GSDM-SGFET)”, Neeraj, Shobha Sharma, Anubha Goel, Sonam Rewari, S. S. Deswal and R. S. Gupta, 10th International Conference on Microelectronics, Circuits & Systems (Micro 2023) held during 1-3rd July 2023, in Hotel Vivanta, Guwahati, Assam, India. (ISBN:., pp.:., Digital Object Identifier:)	
		4	“Impact of Interface Trap Charges on Noise and Electrical Properties of 4H-SiC Based Gate-Stack, Dual Metal, Surrounding Gate, FET(4H-SiC-GSDM-SGFET)”, Neeraj, Shobha Sharma, Anubha Goel, Sonam Rewari, S. S. Deswal and R. S. Gupta, 10th International Conference on Microelectronics, Circuits & Systems (Micro 2023) held during 1-3rd July 2023, in Hotel Vivanta, Guwahati, Assam, India. (ISBN:., pp.:., Digital Object Identifier:)	
		5	“Modelling of Dielectric Pocket-Engineered Dual Metal Nanowire Ferroelectric MOSFET(DPE-DM-NW-Fe FET) to minimize Gate Induced Drain Leakages (GIDL)”, Shalu Garg, Jasdeep Kaur, Anubha Goel, Subhasis Haldar and R. S. Gupta, 10th International Conference on Microelectronics, Circuits & Systems (Micro 2023) held during 1-3rd July 2023, in Hotel Vivanta, Guwahati, Assam, India. (ISBN:., pp.:., Digital Object Identifier:)	
2	Ms. Neeraj	1	Neeraj , Shobha Sharma , Anubha Goel , Sonam Rewari , SS Deswal , R.S.Gupta "Impact of Interface Trap Charges on Noise and Electrical Properties of 4H-SiC Based Gate -Stack Dual Metal , Surrounding Gate, FET(4H-SiC-GSDM-SGFET) 10th International Conference micro	Jul-23
3	Mr. Sudarshan Kumar	1	S.Kumar and A.De, "Cavity -Backed Slot Loaded Substrate Integrated Waveguide Self-Diplexing Antenna for C Band Application" 2022 IEEE 6th Conference on Information and Communication Technology (CICT)Gwalior, India 2022	

		2	S.Kumar and A.De, " Sinusoidally Modulated Substrate Integrated Folded Waveguide as A Filter for Multiband Applications" 2022 International Conference on Computing, Communication and Intelligent Systems (ICCCIS) Greater Noida, India	
4	Ms. Shalu Jindal	1	S.Garg,A.Goel, J. Kaur , S.Haldar and R.S.Gupta" Modelling of Dielectric Pocket - Engineered Dual Metal Nanowire Ferroelectric MOSFET (DPE-DM-NW-Fe-FET) to minimize Gate Induced Drain Leakages (GIDL)" Micro 2023	Jul-23
		2	S.Garg,A.Goel, J. Kaur , S.Haldar and R.S.Gupta" Temperature Sensitive Alalysis of Junctionless Nanowire Ferroelectric Field Effect Transister (JNFe-FET)for Enhanced Alalog Performance " 2023 IEEE Devices for Integrated Circuit(DevIC), Kalyni , India 2023	

List of Patents from August 2022 to August 2023 of Faculty.			
S.No	Name of Faculty	TITLE	Date
1	Dr. Anubha Goel	Neeraj, Anubha Goel , Shobha Sharma, Sonam Rewari and R.S.Gupta , Diary No-10220/2023-CO/SW, "SiC Based Analytical Model for Gate - Stack Dual Metal Nano wire FET for Enhanced Analog Performance:	16 June 2023
2	Ms. Neeraj	Neeraj, Anubha Goel , Shobha Sharma, Sonam Rewari and R.S.Gupta , "SiC Based Analytical Model for Gate -Stack Dual Metal Nano wire FET for Enhanced Analog Performance:	21 April 2023