

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

Department of Electronics and Communication Engineering

Annual Report (2023–2024)

It gives me great pleasure to present the annual report of the Department of Electronics and Communication Engineering for the academic year 2023–2024. This year marked significant academic progress and professional achievements by our dedicated faculty and staff. I am proud to report that **three faculty members** have successfully obtained their **Ph.D. degrees**, further strengthening the department's research potential and academic excellence. Additionally, one **of our technical staff members** have pursued and completed higher education qualifications, thereby enhancing their skillsets and contributing to the academic environment of the department.

We are also delighted to honor **one faculty members** who have completed **15 years of dedicated service** at our institution. Their unwavering commitment and long-standing contributions have played a pivotal role in shaping the department's academic and administrative framework.

The department continues to maintain a strong research culture. During this academic year, our faculty members have published **84 papers** in reputed national and international journals and conferences, and reflecting the growing emphasis on research and innovation. Furthermore, **three patents** have been filed, showcasing the department's focus on translating research into practical and impactful solutions. One book is been written by our faculty members.

As we move forward, the department remains committed to nurturing academic excellence, promoting innovative research, and contributing meaningfully to the institute's vision and mission.

Prof. Sunil Kumar
(HOD, ECE)

List of Faculty members who have completed PhD after 5 Sept. 2023					
Sl. No.	Name Of Faculty	Topic	University	Guide Name	Date of Completion
1	Dr. Sudarshan Kumar	Design and Analysis of Substrate Integrated Waveguide Filter and Antenna	DTU, New delhi	Prof. Asok De	9 Nov 2023
2	Dr. Amit Saxena	Analytical Modeling, Simulation and Characterization of Nanoscale Gate All Around MOSFET Structures for Circuit Applications	GGSIPIU	Prof. Ravindra Kumar Sharma	07-06-2024
3	Dr. Swati Sharma	Modelling & Characterization of Silicon and GaN-based Schottky Nanowire FET	GGSIPIU	Prof. Vandana Nath(GGSIPU), Prof. R.S. Gupta	08-13-2024

List of Staff Members who have acquired additional qualification after 5 Sept. 2023				
Sl. No.	Name Of Staff Member	Name of Degree	University	Date of Completion
1	PARVEEN SAINI	M.C.A	Maharaja Agrasen Himalayan Garhwal University, Uttarakhand	October,2023

15 Year Completed Members			
Sl. No.	Name	Designation	Date of Joining
1	Dr. Anubha Goel	Assistant Professor	01-01-2009

Patent details of Faculty members after 5 Sept. 2023										
Sl. No.	Applicant Name	Inventors	Patent Application No.	Status	Title of Patents	Patent Filed date	Patent published / Grant Date	Session	Patent Publication No.	Affiliation of applications at the time of filing
1	Dr. Anubha Goel	Neeraj, Dr. Anubha Goel, Shobha Sharma, Sonam Rewari, S. S. Deswal and R. S. Gupta	202311053897	FER Issued, reply not filed	A Field Effect Transistor for Detecting Gas	August 11, 2023	27-10-23			Maharaja Agrasen Institute of Technology
2	Ms. Neeraj	Neeraj, Dr. Anubha Goel, Shobha Sharma, Sonam Rewari, S. S. Deswal and R. S. Gupta	202311053897	FER Issued, reply not filed	A Field Effect Transistor for Detecting Gas	August 11, 2023	27-10-23			IGDTUW
3	Prof. R S Gupta	Neeraj, Dr. Anubha Goel, Shobha Sharma, Sonam Rewari, S. S. Deswal and R. S. Gupta	202311053897	FER Issued, reply not filed	A Field Effect Transistor for Detecting Gas	August 11, 2023	27-10-23			Maharaja Agrasen Institute of Technology

List of Faculty members who have written books after 5 Sept. 2023

Sl. No.	Faculty	Title of Book	Publisher	DOI (if any) /Date	ISBN
1	Dr. Rajni	Statistics, Statistical Modeling & Data Analytics	S. K. Kataria & Sons	Feb 2024	ISBN: 9789350147849
2	Mr. Ajay Kumar Gupta				
3	Ms. Kanika Agarwal				

Details of Paper Published in Journal (International/National) after 5 Sept. 2023

Sl. No.	Faculty/ Author	Co-Authors	Paper Title	Journal Name	Year	Volume, Page No.	DOI	Indexing	ISSN/ISBN No.
1	Ajay Kumar Gupta	Prof Manav Bhatnagar, IITD	A Non-Cooperative Pricing Strategy for UAV-Enabled Charging of Wireless Sensor Network	IEEE Transaction on Green Communication and Networking	2024	Early Access	10.1109/TG-CN.2024.3434603	SCI/IEEE/Q1	Electronic ISSN: 2473-2400
2	Ajay Kumar Gupta	Prof Manav Bhatnagar, IITD	St-Hot: A Prospect of Price Equilibrium in a Multi-player Game for Electric Vehicle Charging Application	IEEE Access	2024	Vol. 12, pp. 104391 - 104405	10.1109/ACCESS.2024.3435367	SCI/IEEE/Q1	Electronic ISSN: 2169-3536
3	Ajay Kumar Gupta	Prof Manav Bhatnagar, IITD	A Comprehensive Pricing-Based Scheme for Charging of Electric Vehicles	IEEE Systems Journal	2023	Vol. 17, Issue 3, pp 3492 - 3502	10.1109/JST.2023.3286902	SCI/IEEE/Q1	Electronic ISSN: 1937-9234
4	Dr. Anubha Goel	Prajvi Udar, R. S. Gupta	Nanoscale Temperature Dependent Quantum-Effect Analytical model of Short- Channel, Junction-Less, Double-Gate Stack (SC-JL-DG) MOSFET for Analog Applications at Higher Frequencies	Microelectronics Journal (Elsevier)	Nov, 2023	Vol.14 1 , pp. 105952	https://doi.org/10.1016/j.mejo.2023.105952	SCI	0959-8324
5	Dr. Anubha Goel	Ritika Sorot, Sonam Rewari	Novel Hybrid-CMOS Inverter utilizing Phase Transition Material for enhancing Digital Logic Performance at lower operating Voltages	Physica Scripta (IOP Science)	2024	vol. 99, No. 3, pp. 035024	https://doi.org/10.1088/1402-4896/ad274a	SCI	1402-4896
6	Dr. Anubha Goel	Neeraj, Shobha Sharma, Sonam Rewari, S. S. Deswal, R. S. Gupta	Modeling and Simulation Characteristics of a Highly-Sensitive Stack-Engineered Junctionless Accumulation Nanowire FET for PH3 Gas Detector	ECS Journal of Solid State Science and Technology (IOP Science)	2024	vol. 13 , no. 2 , pp. 027007	https://doi.org/10.1149/2162-8777/ad26a2	SCI	2162-8777
7	Dr. Anubha Goel	Shalu Garg, Jasdeep Kaur, Subhasis Haldar, R. S. Gupta	Accurate 2-D analytical model for cylindrical gate-junctionless ferroelectric-nanowire (CG-JFe-NW) MOSFET with scaled channel length	Physica Scripta (IOP Science)	2024	vol. 99 , No. 5, pp. 055240	https://doi.org/10.1088/1402-4896/ad39b9	SCI	1402-4896
8	Dr. Anubha Goel	Shalu Garg, Jasdeep Kaur, Subhasis Haldar, R. S. Gupta	Dielectric Pocket Engineered, Gate Induced Drain Leakages (GIDL) and Analog Performance Analysis of Dual Metal Nanowire Ferroelectric MOSFET (DPE-DM-NW- Fe FET) as an Inverter	Microsystem Technologies (Springer)	2024	pp.: 1-12	10.1007/s00542-024-05681-4	SCI	1432-1858
9	Dr. Anubha Goel	Neeraj, Shobha Sharma, Sonam Rewari, S. S. Deswal, R. S. Gupta	Impact of Interface Trap Charges on Silicon Carbide (4H-SiC) Based Gate – Stack, Dual Metal, Surrounding Gate, FET (4H-SiC-GSDM-SGFET) for Analog and Noise Performance Analysis for 5G/LTE Applications	ECS Journal of Solid State Science and Technology (IOP Science)	2024	vol. 13 , no. 7, pp. 073015	10.1149/2162-8777/ad6502	SCI	2162-8777
10	Dr. Sudarshan Kumar	Prof. Asok De	Design and Mode Matching Analysis of Stepped Substrate Integrated Waveguide and Filters	IETE Journal of Research	2024	Volume 70, Number 2, 1 February 2024,	https://doi.org/10.1080/03772063.2023.2171917	SCI	0377-2063

						pp. 1239-1247(9)			
11	Dr. Amit Saxena	Jitender Kumar, Aparna N. Mahajan, S. S. Deswal, R. S. Gupta	RF and linearity parameters analysis of 20 nm gate-all-around gate-stacked junction-less accumulation mode MOSFET for low power circuit applications	Microsystem Technologies (Springer)	2024	Volume 30, pages 673–685, (2024)	https://doi.org/10.1007/s00542-023-05590-y	SCI	Electronic ISSN :1432-1858
12	Dr. Amit Saxena	Jitender Kumar, Aparna N. Mahajan, S. S. Deswal, R. S. Gupta	Design of Low Power Analog/RF Signal Processing Circuits Using 22 nm Silicon-on-Insulator Schottky Barrier Nano-Wire MOSFET	International Journal of High Speed Electronics and Systems	2024	Vol. 33, No. 01, 2450003 (2024)	https://doi.org/10.1142/S0129156424500034	SCOPUS	ISSN (online): 1793-6438I
13	Dr. Amit Saxena	Jitender Kumar, Aparna N. Mahajan, S. S. Deswal, R. S. Gupta	Extraction of non-quasi-static model parameters for cylindrical gate-stacked junction-less accumulation mode MOSFET and its implementation as RF filters for circuit applications	Microsystem Technologies (Springer)	2023	Volume 29, pages 1431–1442, (2023)	https://doi.org/10.1007/s00542-023-05524-8	SCI	Electronic ISSN :1432-1858
14	Ms. Shalu Garg	Jasdeep Kaur, Anubha Goel, Subhasis Haldar, R. S. Gupta	Accurate 2-D analytical model for cylindrical gate-junctionless ferroelectric-nanowire (CG-JFe-NW) MOSFET with scaled channel length	Physica Scripta (IOP Science)	2024	vol. 99 ,No. 5, pp. 055240	https://doi.org/10.1088/1402-4896/ad39b9	SCI	1402-4896
15	Ms. Shalu Garg	Jasdeep Kaur, Anubha Goel Subhasis Haldar, R. S. Gupta	Dielectric Pocket Engineered, Gate Induced Drain Leakages (GIDL) and Analog Performance Analysis of Dual Metal Nanowire Ferroelectric MOSFET (DPE-DM-NW- Fe FET) as an Inverter	Microsystem Technologies (Springer)	2024	pp.: 1-12	10.1007/s00542-024-05681-4	SCI	1432-1858
16	R S Gupta	Jitender Kumar, Aparna Mahajan, amit Saxena, SS deswal	Extraction of Non-Quasi-Static Model Parameters for Cylindrical Gate-Stacked Junction-less Accumulation Mode MOSFET and Its Implementation as RF Filters for Circuit Applications	Microsystem Technologies	2023	29(10), 1431-1442		SCI	1432-1858
17	R S Gupta	Prajvi Udar, Anubha Goel	Nanoscale temperature dependent quantum-effect analytical model of short-channel, junction-less, double-gate stack (SC-JL-DG) MOSFET for analog applications at higher frequencies	Microelectronics Journal	2023	141, 105952	https://doi.org/10.1016/j.mejo.2023.105952	SCI	9598324
18	R S Gupta	Preeti Goyal, Garima Srivastava, Jaya Madan, Rahul Pandey	Analytical Modelling and Reliability Analysis of Charge Plasma-Assisted Mg ₂ Si/Si Heterojunction Dopingless DGTFTFET for Low-Power Switching Applications	Physica Scripta	2023	99(1), 015008	DOI 10.1088/1402-4896/ad1232	SCI	1402-4896
19	R S Gupta	Amit Das, Sonam Rewari, Binod Kumar Kanojia, S S Deswal	Analytical investigation of a triple surrounding gate germanium source metal–oxide–semiconductor field-effect transistor with step graded channel for biosensing applications.	International Journal of Numerical Modelling	2023	36(6):e3106.	https://doi.org/10.1002/jnm.3106	SCI	9598324

20	R S Gupta	Sumedha, Neeta Pandey	Modeling of Dual- Metal Junction less Accumulation-Mode cylindrical surrounding gate MOSFET for cryogenic temperature applications	Microelectronics Journal	2023	1903:4 0:00	https://doi.org/10.1016/j.mejo.2023.105880	SCI	9598324
21	R S Gupta	Amit Das, Sonam Rewari, Binod Kumar Kanojia, S S Deswal	Ge/Si interfaced label free nanowire BIOFET for biomolecules detection-analytical analysis.	Microelectronics Journal	2023	138:10 5832.	https://doi.org/10.1016/j.mejo.2023.105832	SCI	9598324
22	R S Gupta	Amit Das, Sonam Rewari, Binod Kumar Kanojia, S S Deswal	Analytical modeling and doping optimization for enhanced analog performance in a Ge/Si interfaced nanowire MOSFET.	Physica Scripta	2023	98(7):0 74005	DOI 10.1088/1402-4896/acde16	SCI	1402-4896
23	R S Gupta	Amit Das, Sonam Rewari, Binod Kumar Kanojia, S S Deswal	Physics based numerical model of a nanoscale dielectric modulated step graded germanium source biotube FET senso	Physica Scripta	2023	98(11): 11501	DOI 10.1088/1402-4896/acf4c9	SCI	1402-4896
24	R S Gupta	Jitender Kumar, Aparna Mahajan, amit Saxena, SS deswal	RF and linearity parameters analysis of 20 nm gate-all-around gate-stacked junction-less accumulation mode MOSFET for low power circuit applications	Microsystem Technologies, Springer Berlin Heidelberg	2024	Volume 30, pages 673–685, (2024)		SCI	9467076
25	R S Gupta	Jitender Kumar, Aparna Mahajan, amit Saxena, SS deswal	Design of Low Power Analog/RF Signal Processing Circuits Using 22 nm Silicon-on-Insulator Schottky Barrier Nano-Wire MOSFET	International Journal of High Speed Electronics and Systems	2024	2450003	https://doi.org/10.1142/S0129156424500034	SCI	ISSN (online): 1793-6438
26	R S Gupta	Sumedha, Neeta Pandey	Non-uniform doping dependent electrical parameters of dual-metal gate all around junctionless accumulation-mode nanowire FET	International Journal of Numerical Modeling	2024	37(2):e 3203	https://doi.org/10.1002/inm.3203	SCI	1099-1204
27	R S Gupta	N Neeraj, S Sharma, A Goel, S Rewari, SS Deswal	Modeling and Simulation Characteristics of a Highly-Sensitive Stack-Engineered Junctionless Accumulation Nanowire FET for PH3 Gas Detection	ECS Journal of Solid State Science and Technology	2024	Volume 30, pages 673–685, (2024)	DOI 10.1149/2162-8777/ad26a2	SCI	2162-8777
28	R S Gupta	Shalu Garg, Jasdeep Kaur, Anubha Goel, Subhasis Halder	Accurate 2-D Analytical Model for Cylindrical Gate- Junctionless Ferroelectric Nanowire (CG-JFe-FET) MOSFET with Scaled Channel Length	Physica Scripta	2024	99(5):0 55240	DOI 10.1088/1402-4896/ad39b9	SCI	1402-4896
29	R S Gupta	Shalu Garg, Jasdeep Kaur, Anubha Goel, Subhasis Halder	Dielectric Pocket Engineered, Gate Induced Drain Leakages (GIDL) and Analog Performance Analysis of Dual Metal Nanowire Ferroelectric MOSFET (DPE-DM-NW-Fe FET) as an Inverter	Microsystem Technologies	2024	pp. 1-12	DOI 10.1088/1402-4896/ad39b9	SCI	9467076
30	R S Gupta	Preeti Goyal, Garima Srivastava, Jaya Madan, Rahul	A Mg2Si hetero junction based dielectric modulated dopingless TFET biosensor for label free detection	Material Science and Engineering-B	2024	304, 117356	https://doi.org/10.1016/j.mseb.2024.117356	SCI	9215093

		Pandey, R S Gupta							
31	R S Gupta	Neeraj, Anubha Goel, Shobha Sharma, Sonam Rewari, SS Deswal	Impact of Interface Trap Charges on Silicon Carbide (4H-SiC) Based Gate – Stack, Dual Metal, Surrounding Gate, FET (4H-SiC-GSDM-SGFET) for Analog and Noise Performance Analysis for 5G/LTE Applications	ECS Journal of Solid State Science and Technology	2024	vol. 13 , no. 7, pp. 073015	DOI 10.1149/2162-8777/ad26a2	SCI	2162-8777
32	Neeraj	Neeraj, Anubha Goel, Shobha Sharma, Sonam Rewari, SS Deswal	Impact of Interface Trap Charges on Silicon Carbide (4H-SiC) Based Gate – Stack, Dual Metal, Surrounding Gate, FET (4H-SiC-GSDM-SGFET) for Analog and Noise Performance Analysis for 5G/LTE Applications	ECS Journal of Solid State Science and Technology	2024	vol. 13 , no. 7, pp. 073015	10.1149/2162-8777/ad6502	SCI	2162-8777
34	Dr. Rajni	Kanika Agarwal, C.S Rai	Lp minimisation in sparse array beamforming using semidefinite relaxation	International Journal of Electronics Letters	2023	Volume 12, Pages 193-209	https://doi.org/10.1080/21681724.2023.2251766	SCI	21681732, 21681724
33	Neeraj	N Neeraj, S Sharma, A Goel, S Rewari, SS Deswal	Modeling and Simulation Characteristics of a Highly-Sensitive Stack-Engineered Junctionless Accumulation Nanowire FET for PH3 Gas Detection	ECS Journal of Solid State Science and Technology	2024	Volume 30, pages 673–685, (2024)	DOI 10.1149/2162-8777/ad26a2	SCI	2162-8777
35	Kanika Agarwal	C.S Rai, Dr. Rajni	Lp minimisation in sparse array beamforming using semidefinite relaxation	International Journal of Electronics Letters	2023	Volume 12, Pages 193-209	https://doi.org/10.1080/21681724.2023.2251766	SCI	21681732, 21681724
36	Kanika Agarwal	C.S. Rai	Constrained complex correntropy applied to adaptive beamforming in non Gaussian noise environment	Signal, Image, and Video Processing	2023	Volume 18, Pages 2333–2343	https://doi.org/10.1007/s11760-023-02910-7	SCI	Electronic ISSN: 1863-1711
37	Sumedha Gupta	Neeta Pandey, R S Gupta	Modeling of Dual- Metal Junctionless Accumulation-Mode cylindrical surrounding gate MOSFET for cryogenic temperature applications	Microelectronics Journal	2023	Volume 139	https://doi.org/10.1016/j.mejo.2023.105880	SCI	9598324
38	Sumedha Gupta	Neeta Pandey, R S Gupta	Non-uniform doping dependent electrical parameters of dual-metal gate all around junctionless accumulation-mode nanowire FET	International Journal of Numerical Modeling	2024	Volume 37 Issue 2 e3203	https://doi.org/10.1002/jnm.3203	SCI	1099-1204
39	Preeti Goyal	Preeti Goyal, Garima Srivastava, Jaya Madan, Rahul Pandey	Analytical Modelling and Reliability Analysis of Charge Plasma-Assisted Mg ₂ Si/Si Heterojunction Dopingless DGTFT for Low-Power Switching Applications	Physica Scripta	2023	99(1), 015008	DOI 10.1088/1402-4896/ad1232	SCI	1402-4896
40	Preeti Goyal	Preeti Goyal, Garima Srivastava, Jaya Madan, Rahul Pandey, R S Gupta	A Mg ₂ Si hetero junction based dielectric modulated dopingless TFET biosensor for label free detection	Material Science and Engineering-B	2024	304, 117356	https://doi.org/10.1016/j.mseb.2024.117356	SCI	9215093

41	Nitin Sharma	Antim Dev Mishra., Bindu Thakral, Alpana Jijja	Cardio Predict IoT (CPI): Real Time Heart Disease Prediction Using Cloud Enhanced Machine Learning	Biological Forum – An International Journal	2023	15(5a): 773-781(2023)		SCOPUS	ISSN No. (Print): 0975-1130 ISSN No. (Online): 2249-3239
42	Nitin Sharma	Antim Dev Mishra., Bindu Thakral, Alpana Jijja	Real-time Vital Signs Monitoring and Data Management Using a Low-Cost IoT-based Health Monitoring System	<i>Journal of Health Management</i>	2024	Vol. 26 issue 3	https://doi.org/10.1177/09720634241246926	SCOPUS	ISSN: 0972-0634; Online ISSN: 0973-0729

Details of Paper Published in Conference (International/National) after 5 Sept. 2023

Sl. No.	Faculty/Author	Co-Authors	Paper Title	Conference Name	Year	Proceedings Volume, Page No.	DOI/Link	Indexing (if any)	ISSN/ISBN No.
1	Dr. Sudarshan Kumar	Prof. Asok De	Design of a Half-Mode SIW Band-Pass Filter and Leaky Wave Antenna for X-Band Application	2023 3rd International Conference on Advancement in Electronics & Communication Engineering (AECE)	2023	pp 243-246	10.1109/AECE59614.2023.10428244	IEEE Scopus	979-8-3503-3072-4
2	R S Gupta	M Ruby, S Shobha, R Sonam	Characterization of Radiation-Dependent Dual Channel AlGaIn/GaN MOS-HEMT Based Dosimeter.	9th ICSC	2023	pp. 646-650	10.1109/ICSC60394.2023.10441586		978-1-6654-0782-3

Papers Published by Faculty members after September 5, 2023

Sl. No.	Faculty Name	Total no. of papers in Journal/Conference
1	Mr. Ajay Kumar Gupta	3
2	Dr. Anubha Goel	6
3	Dr. Sudarshan Kumar	2
4	Dr. Amit Saxena	3
5	Ms. Shalu Garg	2
6	Ms. Neeraj	2
7	Ms. Kanika Agarwal	2
8	Dr. Rajni	1
9	Prof. R. S. Gupta	16
10	Ms. Sumedha Gupta	2
11	Ms. Preeti Goyal	2
12	Dr. Nitin Sharma	1