

ANNUAL PROGRESS REPORT (2022-23)
01 July 2022- 30 June 2023
Department of Electronics & Communication
Engineering
Faculty of Engineering & Technology, GKV Haridwar

About the Department:

Electronic systems are something we take for granted. We use cell phones, computers, fitness sensors, navigation systems and video games like a natural thing. But without electronic systems, none of the electronics surrounding us would have worked.

Department of Electronic & communication Engineering (ECE) teaches and do research into further development of this technology. Today's and tomorrow's requirements for advanced communication solutions, energy efficiency, and storage capacity lay the foundation for the Department's work in areas such as microelectronics, wireless technology, navigation, signal and image processing, voice and music technology and nanotechnology. Department of Electronic & communication Engineering is one of Five departments at Faculty of Engineering & Technology, Gurukula Kangri (Deemed to be University), Haridwar. The faculty is located at Shardhanand puram, Bhadrabad Haridwar.

Department was established in 2001. It was the pioneer department of FET. Department was started with 30 seats but since its inception it has been the best department and its intake has now increased to 115.

Head of the Department: Dr. Vipul Sharma

Faculty Members:

1. Dr. Tanuj Garg
2. Dr. Gorav Kumar Malik
3. Dr. Ashish Nainwal
4. Dr Atul Varshney
5. Dr. Vivek Arya
6. Mr. Anuj Kumar Sharma
7. Mr Shiv Kumar Singh
8. Mr. Prateek Agarwal
9. Mr. Amrish

1. Publication work/Research work
 - A. Number of Research Paper Published: **19 (Annexure-1)**
 - B. Number Project Completed/Ongoing: **01 (Annexure-2)**
2. Paper presented in Seminars/Conference/Webinar/Workshop: **07 (Annexure-3)**
3. Awards from Society or Government: **Nil**

4. No. of Seminars/Conferences/Webinar/Workshop organized:
03(Annexure-4)

5. Any other Important Information's: **(Annexure-5)**

1. Book Chapter Published: - 05
2. List of patents published/granted by the department: 02
3. FDP/STC/Refresher course attended by the faculty: - 03
4. Conference full length paper published: 01
5. Invited lecture given by Faculties: 05

Head
Department of ECE
Faculty of Engineering & Technology

Annexure-1

Details of Research Publications

1. Varshney, A., Sharma, V., & Agarwal, A. (2023). Next-Generation MS-to-RWG Interconnects for Microwave and mm-Wave Communications Using Microstrip Antenna as RF Energy Launcher@ 140 GHz. *Journal of The Institution of Engineers (India): Series B*, 1-8.
2. Varshney, A., & Sharma, V. (2023). Aerodynamic slotted SIW-to-MS line transition using mitered end taper for satellite and RADAR communications. *World Journal of Engineering*.
3. Varshney, A., Sharma, V., Nayak, C., Goyal, A. K., & Massoud, Y. (2023). A Low-Loss Impedance Transformer-Less Fish-Tail-Shaped MS-to-WG Transition for K-/Ka-/Q-/U-Band Applications. *Electronics*, 12(3), 670.
4. Varshney, A., Sharma, V., Elfergani, I., Zebiri, C., Vujicic, Z., & Rodriguez, J. (2022). An Inline V-Band WR-15 Transition Using Antipodal Dipole Antenna as RF Energy Launcher@ 60 GHz for Satellite Applications. *Electronics*, 11(23), 3860.
5. Elfergani, I., Varshney, A., Sharma, V., Kannan, S. R., Udaiyakumar, R., Zebiri, C., ... & Abd-Alhameed, R. (2023). An Economic Low-profile Elliptical Microstrip Antenna-to-RWG Transition for Microwave Laboratory and X-Band Applications.
6. Varshney, A., & Sharma, V. (2023). Notch-band Eliminator Wideband CSRR Loaded Monopole Fractal Antenna for ISM and PCS Communications. *World Journal of Engineering*.
7. Varshney, A., Kumari, P., Pradhan, D., & Sahu, P. K. (2023). Hybrid $\beta\Omega$ -Indexing Fractal Slotted Multiband Antenna for Electronics Wireless Sensor Applications.
8. Diana Andrushia, A., Mary Neebha, T., Trephena Patricia, A., Umadevi, S., Anand, N., & Varshney, A. (2023). Image-based disease classification in grape leaves using convolutional capsule network. *Soft Computing*, 27(3), 1457-1470.
9. Neebha, T. M., Andrushia, A. D., Malin Bruntha, P., Varshney, A., Manjith, R., & Dhanasekar, S. (2023). On the design of miniaturized C-shaped antenna based on artificial transmission line loading technique. *Journal of Electromagnetic Waves and Applications*, 1-13.

10. Varshney, A. (2023). A Critical Review on Challenges and Limitations in Artificial Intelligence-Based e-Health Applications. Juniper Publisher.
11. Arya, V., Garg, T., & Al-Khafaji, H. M. R. (2023). High Gain and Wide-Angle Continuous Beam Scanning SIW Leaky-Wave Antenna. *Electronics*, 12(2), 370.
12. Arya, V., Garg, T., & Al-Khafaji, H. M. R. (2023). SIW Leaky Wave Antenna for THz Applications. *Electronics*, 12(8), 1839.
13. Arya, V., Choubey, H., Sharma, S., Chen, T. Y., & Lee, C. C. (2022). Image Enhancement and Features Extraction of Electron Microscopic Images Using Sigmoid Function and 2D-DCT. *IEEE Access*, 10, 76742-76751.
14. Kumari, M., Narayan, Y., & Arya, V. (2023). Design and investigation of hybrid PON-FSO system employing modified NZCC code under distinct weather conditions. *Transactions on Emerging Telecommunications Technologies*, 34(2), e4699.
15. Narayan, Y, Raman R., Sharma, A., Soni, S. Chandra, P., Gupta, A. (2023). Design and implementation of a smart traffic management system using internet of things (IOT) technology. *European Chemical Bulletin*, 12(5),417-434.
16. Sharma, A. K., Sharma, V., Singh, S. K., Garg, T., & Singh, S. (2023). Fractal Array Antenna: A Review of the State of the Art. *European Chemical Bulletin*, 12(7),1460-1474.
17. Kumar, S., Singh, J., Fore, V., & Kumar, A. (2023). Performance evaluation of ANFIS, ANN and RSM in biodiesel synthesis from Karanja oil with Domestic Microwave set up. *Multimedia Tools and Applications*, 1-17.
18. Agarwal, P., Kumar Garg, T., & Kumar, A. (2023). Analysis of 3D NoC Router Chip on Different FPGA for Minimum Hardware and Fast Switching. *National Academy Science Letters*, 1-5.
19. Agarwal, P., Kumar Garg, T., & Kumar, A. (2023). 2D Router Chip Design, Analysis, and Simulation for Effective Communication. *International Journal of Informatics and Communication Technology*,225-235.

Annexure-2

1. Dr. Tanuj Garg has been awarded a DRDO-funded research project titled "Beam scanning rate enhancement in leaky wave antenna at X-Ku at a fixed frequency." The duration of the project is 2.5 years, and the total fund is Rs. 33.43570 Lakh.

Annexure-3

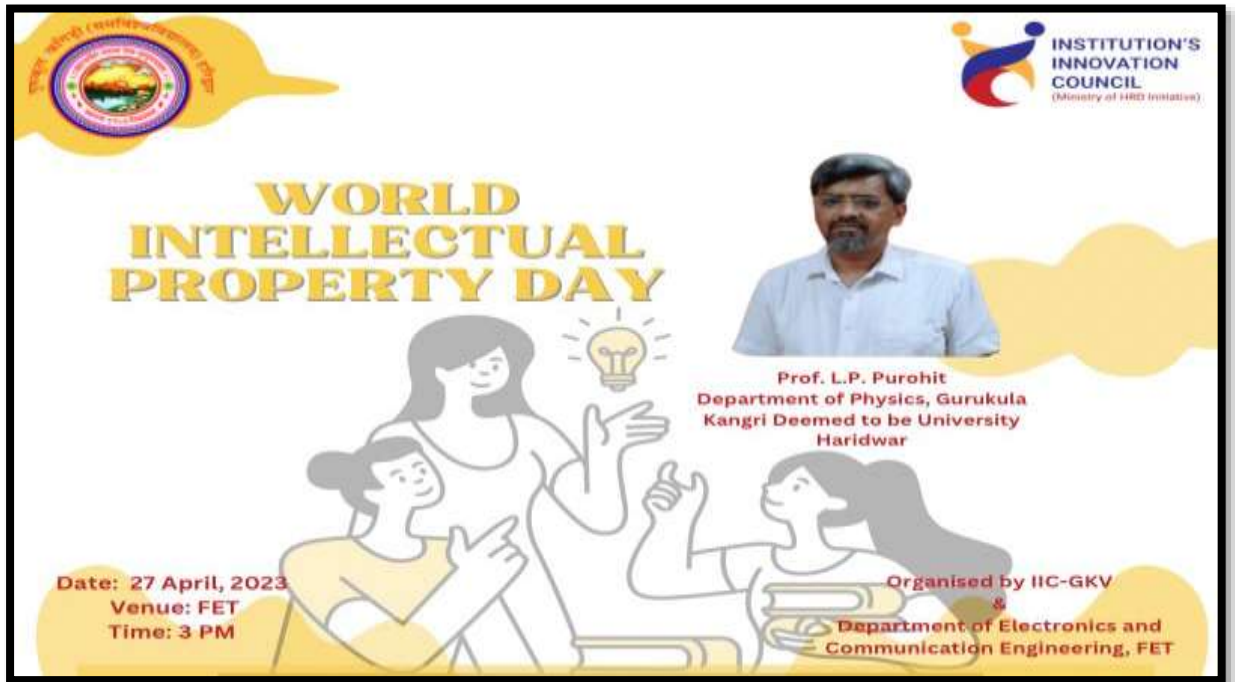
1. Dr. Atul Varshney presented a paper titled “An Inline G-band WR-5 Transition using Antipodal Dipole Antenna as Launcher @ 180GHz for Sub mm-wave Lower THz Applications” in 10th International Conference on Advancements in Engineering and Technology, on the date 11/11/2022.
2. Dr. Atul Varshney presented a paper titled “Low-Cost Slited Hybrid Fed Monopole Miniaturize Antenna for Dual Band PCS and ISM Band Applications” in 10th International Conference on Advancements in Engineering and Technology, on the date 11/11/2022.
3. Mr. Anuj Kumar Sharma presented a paper titled “The Vedic Tradition of Engineering” in National Conference on Knowledge, Cultural Traditions & Practices of India, organized by Gurukul Kangri Deemed to be University, Haridwar, on the date 30/3/2023.
4. Mr. Anuj Kumar Sharma presented a paper titled “Findings of Science and Engineering in” in National Conference on Knowledge, Cultural Traditions & Practices of India, organized by Gurukul Kangri Deemed to be University, Haridwar, on the date 30/3/2023.
5. Dr. Atul Varshney presented a paper titled “An offset fed Double Symmetric Koch” in National Conference on Recent Advances in Communicative Electronics (NCRACE 2023)), on the date 10/3/2023.
6. Dr. Atul Varshney presented a paper titled “An offset fed Double Symmetric Koch” in National Conference on Recent Advances in Communicative Electronics (NCRACE 2023)), on the date 10/3/2023.
7. Presented a paper titled on “Router-Router Switching Communication and Logic Verification with Configured Hardware Chip” IEEE International Conference IC2E3, NIT Srinagar (U.K.).

Annexure-4

1. Under the title of “**Celebration Activity**” One day workshop was organized by ECE Department and IPR cell of IIC Gurukul Kangri Deemed to be University Haridwar, on 27th April 2023 in FET.

and The workshop was organized for all the faculty members of university, students Ph.D. research scholars. Prof. L. P. Purohit is Professor in Department of Physics, GK(DU), Haridwar was present as resource persons (speaker).

Following are the glimpses of the program:



विश्व बौद्धिक दिवस पर कार्यशाला का आयोजन



कार्यशाला में उपस्थित प्रो एलपी पुरोहित व अन्य शिक्षक ।

हरिद्वार, 28 अप्रैल (कुलभूषण) : गुरुकुल कांगड़ी समविश्वविद्यालय के इंस्टीट्यूट इनोवेशन काउंसिल, इलेक्ट्रॉनिक्स एंड कम्युनिकेशन इंजीनियरिंग विभाग में विश्व बौद्धिक संपदा दिवस पर कार्यशाला का आयोजन किया गया। कार्यशाला में मुख्य वक्ता के रूप में प्रो. एलपी पुरोहित ने शिक्षकों व छात्रों को बौद्धिक संपदा अधिकारों की महत्वपूर्ण बारीकियों से अवगत कराया। उन्होंने बताया कि कैसे कॉपीराइट, ट्रेडमार्क व पेटेंट आदि कराए जा सकते हैं। कार्यशाला का संचालन आईआईसी के समन्वयक डॉ. विवेक आर्य ने किया। इस अवसर पर संकायाध्यक्ष डॉ. सुनील पवार, डॉ. गजेंद्र सिंह रावत, डॉ. संजीव लांबा, डॉ. मयंक पोखरियाल, डॉ. आशीष धामंदा, गौरव कुमार, अकाश मिश्रा, डॉ. कपिल देव, डॉ. अमरीश, डॉ. आशीष नैनवाल आदि मौजूद रहे।

2. The event “**Interaction with TPO**” was organized on 12th September 2022 at 3.00 PM in online mode for students of 4th-year Electronics and Communication Engineering.

The TPO of CAOC Gurukul Kangri deemed to be university Haridwar, Dr Rajul Bhardwaj informs students about placement activity, Curriculum vitae, interview questions, the difference between in-hand and CTC salary etc. He also resolved the student's query regarding placement.

Following are the glimpses of the program:



**Gurukul Kangri (Deemed to be University)
Haridwar**

**Department of Electronics and Communication
Engineering**



Dr Rajul Bhardwaj

Training and Placement Officer
Gurukul Kangri (DU), Haridwar

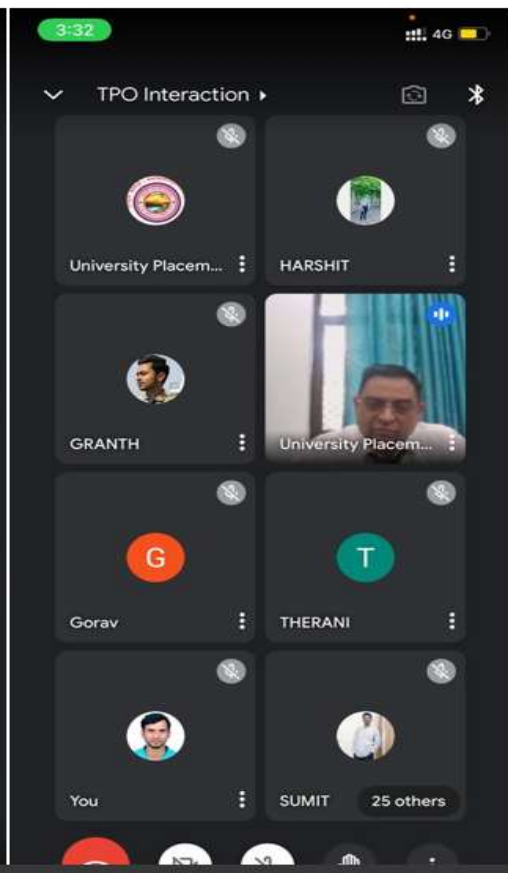
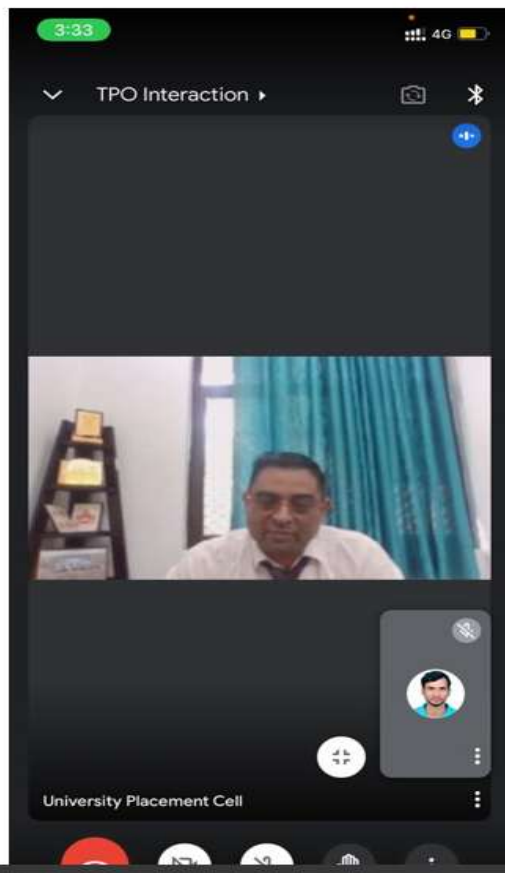
INTERACTION WITH TPO

**Electronics and Communication Engineering
2023 Passout Students**



DATE: 12 SEP 2022
3.00PM ONWARDS

Meet Link: meet.google.com/kom-cjza-qwx



3. Department of ECE ORGANISED A ONE DAY WORKSHOP ON “Teaching and Learning Methods in Science & Technology” on the date 09/01/2023.

Annexure-5

1. Book Chapter Published: -

1. Mr. Anuj Kumar Sharma, Dr. Vipul Sharma, Mr. Shiv Kumar Singh published a book chapter on the title “Study about Massive MIMO Communication”, Techniques and Innovation in Engineering Research, Volume 2, ISBN/ISSN: 978-93-5547-879-5.

2. Mr. Anuj Kumar Sharma published a book title “Embedded System”, Deccan International Publisher, ISBN/ISSN: - 978-93-95191-05-0.

3. Dr. Atul Varshney, Dr. Vipul Sharma published a book chapter on the title “Microstrip interconnect design and modeling using reverse approach to obtain an efficient wideband MS line-to-RWG hybrid transition”, CRC Press, Taylor and Francis, Boca Raton, Volume 2, ISBN/ISSN: 9781003347057.

4. Dr. Atul Varshney, Dr. Vipul Sharma published a book chapter on the title “A compact low-cost impedance transformer-fed wideband monopole antenna for Wi-MAX N78-band and wireless applications”, CRC Press, Taylor and Francis, Boca Raton, Volume 2, ISBN/ISSN: 9781003347057.

5. Dr. Gorav Malik, Dr. Ashish Nainwal published a book chapter on the title “Arm fracture detection using deep convolution neural network”, Recent Advances in Materials and Manufacturing Technology, Springer, ISBN/ISSN: 9781003347057.

2. List of Patents

1. Mr. Anuj Kumar Sharma, Mr. Shiv Kumar Singh published (Granted) a South African Patent titled “additive manufacturing through binder jetting technique for biomedical equipment” on 26/10/2022, Patent Number: 2022/08579.

2. Dr. Vivek Arya, Dr. Tanuj Garg published a Indian Patent titled “an annular ring microstrip antenna and a method for forming the same” on 04/10/2022, Patent Number: 428550.

3. FDP/STC/Refresher course attended by the faculty

1. Mr. Anuj Kumar Sharma attended a Refresher course on “ICT” Organized by UGC-HRDC Sant Gadge Baba Amravati University, from 1/08/2022 to 13/08/2022.

2. Mr. Shiv Kumar Singh attended a Refresher course on “ICT” Organized by UGC-HRDC Sant Gadge Baba Amravati University, from 1/08/2022 to 13/08/2022.

3. Mr. Shiv Kumar Singh attended STC on “Latest trends in remote sensing & GIS” Organized by AICTE, from 25/07/2022 to 29/07/2022

4. Conference full length paper published

1. Dr. Ashish Nainwal, Mr. Amrishi, Dr. Gorav Kumar Malik published a paper titled “Comparative study using RSM ANN and SVM modelling for Biodiesel production from Karanja oil by developed microwave set up” in 2023, 1st International Conference on Intelligent Computing and Research Trends (ICRT), ISSN: 2473-2001.

5. Invited lecture given by Faculties

1. Dr. Atul Varshney given a lecture on the topic “RLC Equivalent Circuit Modelling and Generation for Microstrip Antenna and Microwave Components” in GIET, Sangrur association with IEEE Prakash Bharati In Photonics Society (Rajasthan Chapter, Delhi Section) a Great Alliance Foundation, on the date 23/01/2023.

2. Dr. Atul Varshney given a lecture on the topic “Research Paper Writing” in Department of Computer Science and Technology, FET, Gurukula Kangri (Deemed to be University), Haridwar, Uttarakhand, India, on the date 27/02/2023.

3. Dr. Atul Varshney given a lecture on the topic “Transmission Lines: The base of transitions interconnects for space and RADAR Communications” in FET, Gurukula Kangri (Deemed to be University), Haridwar, Uttarakhand, India, on the date 23/01/2023.

4. Dr. Vivek Arya given a lecture on the topic “Intellectual Property Rights” in Madhav institute of technology & science, Gwalior, on the date 20/01/2023.

5. Dr. Vivek Arya Given a lecture on the topic “Intellectual Property Rights” organized by Dept. of Electrical Engineering, FET GK(DU) Haridwar on the date 7/09/2022.

