



THE FLIP FLOPS

A QUARTERLY ECE NEWSLETTER

SEP-DEC ' 23

Volume 2, Issue 3, Jan 2024

ECE DEPARTMENT PRESENT'S

THE BEST IS YET TO COME

Step into the exciting world of electronics and communications, where innovation knows no bounds. Picture a future where technology seamlessly weaves through our lives, connecting us in ways we have only dreamed of. From the magic of smart devices to the speed of 6G, we are on a journey to redefine possibilities. Join us as we explore the unfolding story of progress – the best is yet to come. Get ready for a future where electronics and communications come together to create a world of endless opportunities.



FROM THE DESK OF HON'BLE VICE CHANCELLOR



**“ FUEL YOUR
FUTURE WITH
THE FLAME OF
KNOWLEDGE ”**

Prof. Alok kumar Chakrawal

Vice Chancellor
Guru Ghasidas Vishwavidyalaya

I take great pride in the remarkable accomplishments and unwavering dedication exhibited by the students, faculty, and staff of our Electronics and Communication Engineering department. Your relentless pursuit of excellence and drive for innovation continue to drive us forward. Together, let's embrace challenges, explore uncharted territories, and leave a lasting imprint in the realm of technology. By pushing boundaries, nurturing curiosity, and maintaining a perpetual thirst for knowledge, we hold the key to a promising future. I am confident that your exceptional skills and unyielding determination will help shape a brighter tomorrow. I'd like to express my sincere gratitude to the editorial team for their diligent efforts in curating this Newsletter. It beautifully highlights the extraordinary achievements of our department and serves as an inspiration for others to fearlessly follow their passions.

FROM THE DESK OF REGISTRAR



Prof. Manish Shrivastava
Registrar
Guru Ghasidas Vishwavidyalaya

It gives me great pleasure to address the esteemed readers of "The Flip Flops," the newsletter of the Department of Electronics and Communication Engineering at Guru Ghasidas Vishwavidyalaya. Our university has always been at the forefront of academic excellence and innovation, and the Department of Electronics and Communication Engineering plays a vital role in upholding this tradition. Your dedication to fostering knowledge, conducting ground-breaking research, and nurturing the next generation of engineers is commendable. In the ever-evolving field of electronics and communication, staying updated with the latest trends and technologies is crucial. I encourage you all to continue your pursuit of knowledge and encourage your students to do the same. Collaborate, explore, and push the boundaries of what is possible in this field. "The Flip Flops" serves as a platform to showcase the department's achievements, share research findings, and celebrate the accomplishments of our faculty and students. I urge you to actively contribute to this valuable publication, sharing your insights, experiences, and success stories. Let us continue to work together to uphold the standards of excellence that Guru Ghasidas Vishwavidyalaya is known for. I wish the Department of Electronics and Communication Engineering continued success in all its endeavors. Thank you for your dedication and hard work.

FROM THE DESK OF DEAN

I welcome you all to the 'Flip Flops,' a newsletter dedicated to UG, PG, Phds aspiring branch: Electronics and Communications Engineering. Here, we share tech insights and honor trailblazers shaping future engineers. Recent events, including our tech fest, enriched students' skills and teamwork. These experiences aid their journey as future engineers and individuals. IEEE student branch at GGV, ECE student club 'SILICON', ECE expert lecture series also provide valuable real-world problem-solving skills. Best wishes to all involved in this endeavor. Good luck!



Prof. Sharad Chandra Srivastava

Dean

School of Studies of Engineering and
Technology, GGV



Dr. Soma Das

Professor and head
Department of Electronics and
Communication Engineering

AMBITION OF THE H.O.D

I'm thrilled to connect through our quarterly magazine as the Head of Electronics and Communication Engineering. Witnessing our department's growth and achievements brings immense joy. Our faculty shapes students' futures with unwavering commitment to excellence in education and research. Students consistently excel, securing accolades, internships, and placements. This edition showcases innovative projects, breakthroughs, and faculty-student achievements, serving as a platform for celebration and inspiration.

Huge thanks to the editorial team for their efforts and to students and faculty for their invaluable contributions.

ARTICLES

Metamaterial: An artificial material



A metamaterial (from the Geek word meta meaning “beyond” and the latin word materia , meaning “matter” or “ material”) is any material needed to have a property that is not found in naturally occurring materials.

They are made from assemblies of multiples elements fashioned from composite materials such as metals and dielectrics. The materials are usually arranged in periodic patterns at scales that are smaller than the wavelengths of the phenomena they influence. Metamaterials derive their

properties not from the properties of the materials from which it is made, but from their newly designed structures. Their precise shape, geometry, size, orientation and arrangement give them their smart properties capable of manipulating electromagnetic waves: by blocking, absorbing, enhancing, or bending waves, to achieve benefits that go beyond which is not possible with conventional materials. Appropriately designed metamaterials can affect waves of electromagnetic radiation or sound in a manner not observed in naturally available materials. The smaller dimension of the unit cell as compared to wavelength and periodicity creates an effective medium which shows negative permittivity and permeability. Simultaneous negative permittivity and permeability produce a negative refractive index medium hence unusual characteristics like the bending of waves are observed. Those that exhibit a negative index of refraction for particular wavelengths have been the focus of a large amount of research. Due to the unusual characteristics of metamaterial, it can be used in cloaking, imaging, filtering and absorption of Electromagnetic waves etc. Metamaterial absorbers are finding applications in energy harvesting, radar cross-reduction and sensing etc.



Dr. Nipun kumar Mishra
(Assistant professor)

Abstract from <https://doi.org/10.1515/freq-2023-0151>,

Laxmikant Dewangan(PhD Scholar)

In this work, the design of broadband, wide-angle, direction-independent metamaterial (MM) electromagnetic wave (EM) absorber for K-band frequency application is investigated and validated experimentally. The unit cell of the metamaterial absorber consists of four 90° rotated L-shaped metallic patches imprinted on a dielectric substrate backed by a metallic sheet. **The structure yield absorption in the broad frequency ranges from 22.5 to 29.3 GHz for both TE and TM polarized waves with more than 90 % absorptivity having a wide fractional bandwidth of (6.8 GHz)**



Laxmikant Dewangan

The structure is four-fold symmetric and hence yields of polarization insensitivity for different angles of polarization under both TE and TM polarized waves. The structure is also investigated under oblique incidence where the 80% absorptivity holds up to 45 degree incident angles for both TE and TM waves. The absorption mechanism is explained with help of top and bottom surface current distribution, induced electric field, and parametric analysis.

To verify the resonance in the structure, characteristic mode, and equivalent circuit analysis have been carried out and presented. A prototype of the absorber has been fabricated and simulated results are validated with measured results. Measured results are showing good agreement with the simulated responses. The novelty of the proposed absorber lies in its unique metallic pattern on a $\lambda/8$ (concerning the center frequency of absorption bandwidth) thin FR-4 substrate while showing the wide absorption bandwidth and direction independence to normal and oblique incidence. The compact nature of the absorber and broadband response with good polarization insensitivity at normal and oblique incidence makes it commercially suitable for the reduction of radar cross section (RCS) in stealth applications at the K-band.

WHAT IS AN ARDUINO ?

Arduino is an open-source platform which is used for building electronics projects, and for designing and building devices that interact with the real world. Arduino consists of both a physical programmable circuit board which is often referred to as a "microcontroller" and an IDE i.e (integrated Development Environment) that mainly runs on our computer, used to write and upload computer codes to the physical board.

Arduino can interact with buttons, LEDs, motors, speakers, GPS units, the internet, smartphones or even the TV! Arduino contains different parts and interfaces together on a single board. The design of the Arduino has evolved through the years and some of the variations include other parts as well.



Madhuri kona
(3rd year)

WHAT IS BASIC ARDUINO MADE OF ?

Arduino Development Board is made up of ATMEGA 328 Microcontroller, USB to SERIAL Interface, 16 MHZ Oscillator, 5v Volatage Regulator & 16 Interfacing Pins - It basically has two types of Pins i.e DIGITAL & ANALOG PINS

A MICROCONTROLLER, also known as the primary chip allows you to program the Arduino to execute various commands and make decisions based on various inputs. The variation of the chip depends completely on the type of Arduino you buy. But most of them use ATMEL controllers, usually ATMEGA328, ATMEGA168 etc. The above microcontrollers are of 8-bit with a reduced instruction set (RISC) based on Harvard Architecutre.

A SERIAL CONNECTOR, Which on most newer boards is implemented through a standard USB port. This connector acts as a mediator for communication between the board and computer, as well as loads new programs onto the the device. Many a time, Arduino can be powered through the USB port, removing the need for a separate power connection.

DEPARTMENTAL ACTIVITIES :

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING HEARTILY WELCOME IT'S NEWLY APPOINTED ASSOCIATE PROFESSORS :

1. Dr. MANOJ KUMAR GUPTA
2. Dr. PRABIRA KUMAR SETHY
3. Dr. RAJIV DEY



TEACHERS DAY - The students of B-Tech department of ECE at SOS(E&T) organized a spectacular event in honor of their professors on the occasion of teacher's day on 5th september 2023. The event was led and organized by **IEEE GGV** student chairperson **ustav kumar (ECE) 4th year** and **silicon student lead shivam srivas(ECE) 4th year** along with the studnets of 1st year to 4th year students. The venue for the event was E-classroom. The hosts of the show were **Amulya priy and Avinash Jha** from the pre-final. it was a fun- filled event with various games for the teachers, dance, music and speech performances by the students. Overall event was entertaining and memorable for the teachers as well as the students. The day ended with presenting mementors to the proffesor and capturing those in the camera, making them lifetime memories.

MoU SAAR 2.0



The Memorandum of Understanding ("MoU") was made in Raipur (CG) on 28th Day of July 2023 between- Raipur Smart City Limited and Guru Ghasidas Vishwavidyalaya, Central University

The Ministry of Housing and Urban Affairs (MoHUA) has launched an initiative Smart cities and Academia towards Action and Research (SAAR). As per the guidelines of SAAR 2.0, the parties desire to prepare detailed research studies on the smart cities projects, which are mutually agreed on and are listed as below. The Parties are entering into this MoU to support each other in preparing the Smart City project research studies as per the scope of this MoU.

Areas of collaboration include joint meeting once every 30 days, preferably through a video conference. Raipur Smart City Limited will provide technical and administrative explanations for the project study to Guru Ghasidas Vishwavidyalaya. It will provide access to or share the Technical/Financial studies (DPRS, Feasibility Reports, Impact assessment reports etc.) with the University for the purpose of the study. The University will provide the manpower and resources necessary for preparing the project studies.



DIGITAL DELIGHT :

On the 10th of October 2023 an amazing workshop named **Digital Delight** was organized by the IEEE and Silicon jointly to elevate your career in Electronics with exclusive Electronic system Design workshop. The event was organized at the E-classroom, New IT building, where the students delved into the fundamentals Electronics systems and Design. From semiconductors to logic gates and amplifiers, it'll cover it all, providing students with valuable insights into this dynamic field.

It helped the students to discover the endless opportunities in Electronic system Design and know how they can whether experienced as a seasoned professional or just starting the journey in electronics, this workshop is **designed to empower** the students with the knowledge **they need**.



HESS COMPETITION

The Silicon Society in collaboration with Chess (Club of Chemical Engineering) organized an Online Chess Competition on 17/10/23 from 4pm to 5pm. The competition was open for all and provided a platform for students to showcase their strategic prowess and engage in friendly competition. The event aimed to promote intellectual development, foster a sense of community, and offer a recreational outlet for students. The competition attracted a diverse range of participants from various schools and departments within the university, highlighting chess as an intellectually stimulating game. Both novice and experienced players enthusiastically joined the event.

The Online Chess Competition emerged as a successful and engaging event within the B-Tech department. It not only provided a platform for intellectual growth but also strengthened the sense of camaraderie among students. The positive response suggests that similar events should be organized in the future, contributing to the vibrant intellectual and recreational culture of the university.

OATH CEREMONY

On the 30th of October 2023 the Dept of [B-tech ECE](#) celebrated the vigilance week through the oath [ceremony](#). All the professors along with the complete student community were a part of this, The oath ceremony was focused on Integrity. Through the oath ceremony each and every professor as well as all the students together pledged for Integrity. Students are the shaping factors of the future of our nation and teaching them the right path is the first and foremost duty of the teaching institutions.

ECE LECTURE SERIES

In the continuation of our ECE Lecture series, a wonderful and informative session took place on December 19th, 2023. The session was organized by [SILICON-GGV](#) and [IEEE student GGV](#) in which the [chief speaker was Shreeti Goyal](#), an alumna from the batch of 2005 department of ECE, who [currently serving as a research scientist at the prestigious Indian Space Research Organization \(ISRO\)](#), at specifically the [\(UR-SC\)\(UR Rao Satellite Centre\)](#). The focus of the session was how to join ISRO and explore similar career prospects.

The event was attended by students from different departments, and the presence of faculty members of GGV made it even more enriching. Shreeti Ma'am began the session by introducing herself to the students and sharing her experiences during her time in college. It was a heartwarming moment as she reminisced about her memories. Alongside her academic journey, she faced numerous challenges, which she openly discussed to motivate the students. Her story resonated with the attendees, leaving them feeling inspired. She also shed light on her life at ISRO, emphasizing the importance of hard work and patience in attaining success. She talked about her struggles before joining ISRO.



she had appeared in several exams with success. Her past struggles serve as a reminder to never stop working hard and never give up in oneself. She encouraged the students to always have confidence in their ability to improve.

As she continued, Ma'am provided insights into the process of joining ISRO after completing a B.tech of 2005 degree. Additionally, Prof. Manish Shrivastava, department of CSE from the batch of 2005, and Prof. Anita Khanna, department of ECE, shared valuable and informative points with the students. To conclude the session, Shreeti engaged in a Q&A session, addressing the students' queries.

The event concluded with a motivational quote, leaving a lasting impact on the audience. Shreeti and Anita Ma'am felicitated all the winners of the Equillibrio competition 2023, adding a touch of celebration to the informative session. Overall, the session was informative and conveyed a valuable message about perseverance and hard work.

UAV WORKSHOP

The 20 December 2023, marked a significant milestone in the journey of technological exploration for the Department of Electronics and Communication Engineering (ECE) as **Silicon** the student class of ECE, in collaboration with IEEE-GGV, orchestrated an enlightening workshop. Continuing the ongoing ECE Lecture Series, the workshop centered around the enthralling theme of Drones and autonomous vehicles hosted by Surya A M, (ECE) 3rd year from the IoT Team at SILICON - GGV. The workshop delved deep into the complex intricacies governing the flight and autonomy of drones and autonomous vehicles. Attendees were taken on an immersive journey through the fundamental control systems that dictate the manoeuvrability and stability of these innovative machines. The session commenced with a comprehensive exploration of Brushless DC Motors (BLDC) and how they form the backbone of these aerial marvels, followed by an in-depth analysis of the dynamics of yaw, pitch, and roll, essential for controlled aerial movements.

A pivotal aspect highlighted during the workshop was the indispensable role played by electronic speed controllers (ESCs) in ensuring the precision and reliability of these vehicles. The nuances of radio communication systems were also thoroughly explored, emphasizing their crucial function in establishing seamless connectivity and communication between the controller and the vehicle. Moreover, attendees were provided with detailed insights on the implementation of PID (Proportional-Integral-Derivative) control logic, elucidating its significance in achieving accurate and responsive control over drones and autonomous vehicles. The integration of Inertial Measurement Units (IMUs) with accelerometers, barometers, and gyroscopes was another crucial point, showcasing their contribution to the vehicles' orientation, stability, and navigation.

Overall, the workshop proved to be an illuminating experience, offering a comprehensive understanding of the intricate technologies governing drones and autonomous vehicles. With a focus on practical applications and theoretical concepts, the event successfully equipped participants with invaluable insights, paving the way for further exploration and advancements in this dynamic field.



TEACHER'S ACHIEVEMENT

1. Pragati Patharia, Nikita Kashyap : dated Oct.19th : Research paper entitled "Gesture-Based Control of Multimedia Player using Python and OpenCV has been accepted for publication in the Journal of Manufacturing Technology Management, Volume no. 34, Issue no. 10, October 2023.
2. Nikita Kashyap presented a paper titled IoT Based Waste Collection and Monitoring System for Smart Cities: A Comprehensive Survey in International Conference on Trends in Energy and Environmental Research For Sustainable Development (TEERSD-2023) organized by the Department of Chemical Engineering, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh, India on 2nd - 3rd November, 2023.
3. Jitendra Bhattacharya achieved the highest position surpassing 3449 other participants with 93% score in the "Introduction to Machine Learning", Faculty Development Programme (FDP) course on Jul. - Sept., 2023.
4. Nipun Kumar Mishra : A research paper on Broadband metamaterial absorbers for stealth applications at K-band was published in the AEU International Journal of Electronics and Communication.
5. Anita Khanna presented a paper entitled "Contest Based Image Retrieval System Using CNN based Deep Learning Models" in the International Conference on Machine Learning and data Engineering

STUDENT'S ACHIEVEMENT

Laxmikant Dewangan : Research paper on Direction independent broad-band wide-angle metamaterial absorber for "K" band applications got accepted and published in Frequenz journal – De Gruyter.

Laxmikant Dewangan : Got selected for physical participation in Ph.D. Student Initiative Program of MAPCON 2023.

Laxmikant Dewangan : Got selected at the zonal level in the University level ANVESHAN-2023 Competition held on 10th October 2023.

Laxmikant Dewangan : Research paper on Ultra-Wide Band Metamaterial Absorber Based on Resistive Sheet for L to Ku Band Application.

Divyansh Panday from B.Tech 2nd year ECE has completed an internship at Oasis InfoByte between Oct. - Nov. 2023 as Frontend Web Developer.

Aanchal Kumari from B.Tech 3rd year ECE has completed an internship at NeuroNexus Innovations between Oct. - Nov. 2023 as a Web Developer.

Students from B.Tech 4th year ECE Ankit Singh, Harsh, and Srijani Som have completed his internship at Tractrix for 6 months duration and soon after that due to their good work they got pre-placement offer.

Students from B.Tech 4th year ECE Nishant Wankhade, Tejas Jitendra Bibekar, Giran Tanmay Bhaskar, and Pratham(IT), participated in a computer vision hackathon. The selection process involved two online rounds-one for a PPT submission and the other for a prototype submission. After successfully being selected in the 1st round they were invited for the final round in Bangalore, which took place on 27th November 2023.

Amiya Vatsa from B.Tech 2nd year ECE has completed a course Introduction to Fundamentals of Data Science from IIT Madras.

GOLD MEDALIST - 10th Convocation (2021-2022)

Nandani Ranjan (B.Tech)

Students of B.Tech 2nd year ECE have joined Clubs like

a) Geeks for Geeks (GFG) Chapter GGV

1. Devang (PR and Outreach member)
2. Aditya Raj (Social Media Sr Executive)
3. Divyansh Pandey (Web Dev Member)
4. Sankarshan Mishra (CP DSA Sr Executive)
5. Sana Pavani (Cyber Security Sr Executive)

b) Google Developer Student Club (GDSC) GGV

1. Amiya Vatsa (CP DSA Executive)
2. Sankarshan Mishra (CP DSA Executive)
3. Nirbhay Singh (AI ML Executive)
4. Divyansh Pandey (Web Development Executive)
5. MD Hasan (Web Development Executive)
6. Sana Pavani (Cloud Computing Executive)
7. Hariom Pandey (Coordination Team Member)

c) Alumni club of B.Tech Nexus

1. Aryan Singh
2. Haiorm Pandey
3. Meghana J
4. Neha Sahu
5. Rtik Kumar Arora

- Preety kumari from (B.Tech 3rd year ECE) got an intership and letter of recommendation from IEEE Bombay Section for 45 days full stack developer intership held from September-October 2023.
- Surya AM of (B.Tech 3rd year ECE) participated in Producerscope-The Product Case study competition Anveshan 2023 and Smart India Hacathon 2023. He joined as marketing coordinator in HubTech solutions a U.S. based company in September (work from home).
- Janumala Akhilendra. Saikiran (B.Tech 4th year ECE) with others participated in Hacksquad 2023 and achieved 45th position among the top 60 teams got selected as winners among the 2000 teams registered teams.