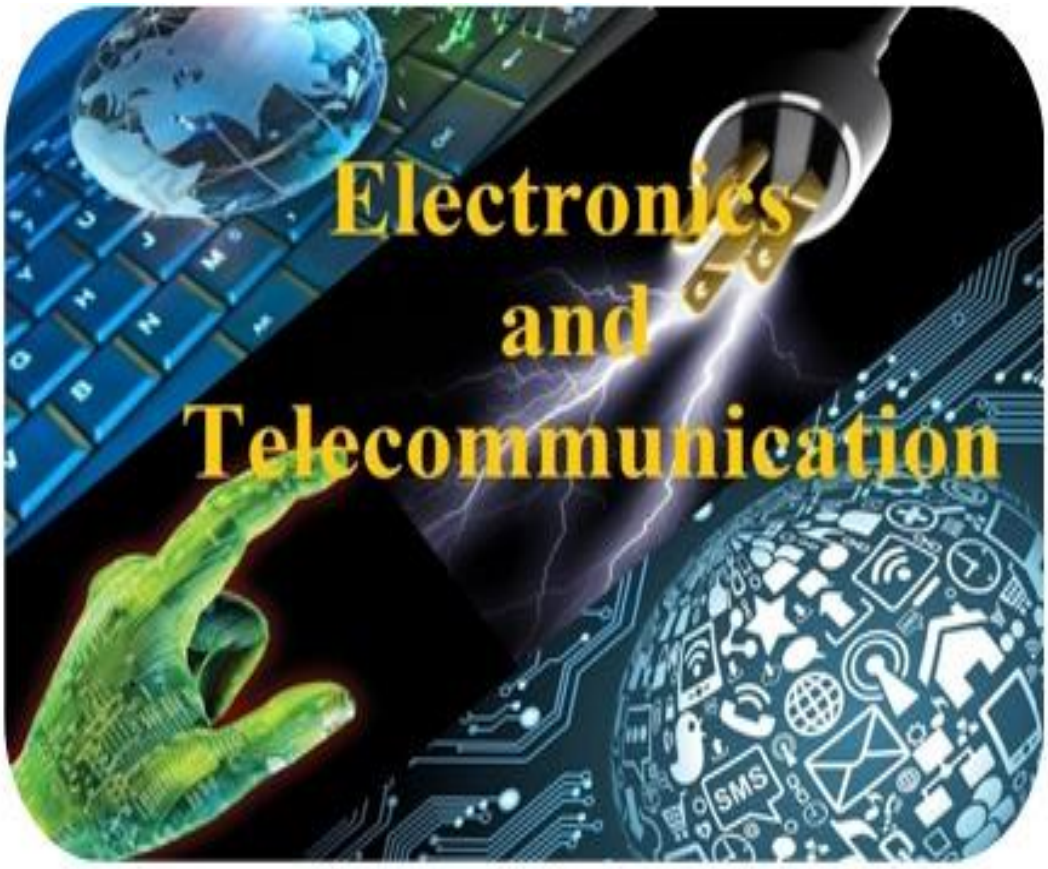
AKHIL BHARATIYA MARATHA SHIKSHAN PARISHAD'S

ANANTRAO PAWAR COLLEGE OF ENGINEERING & RESEARCH

Department of Electronics & Telecommunication

COMMUNICA – 2021-22



Institute Vision

Committed to comprehensive development of students through quality technical education.

Institute Mission

1. To Provide state of art infrastructure that shall create ambience to encourage novel ideas, research activities and consultancy services
2. To inspire students in creation & entrepreneurship
3. To create future technocrats with intelligence, technical skills,& good ethical moral values so as to serve needs of society & industries
4. To provide healthy Teaching-Learning environment that will cultivate contemporary research activities, innovations & inventions
5. To develop Canter of excellence in technical education

Goal of Institute

- Imparting quality engineering education
- Provide healthy environment for physical, intellectual, emotional and spiritual growth of students and staff.
- Create aesthetically sensitive, socially committed and technologically competent Engineers.

OUR INSPIRATION

Hon. Shri. Sharadchandra G. Pawar

President-Akhil Bharatiya Maratha Shikshan Parishad

OUR OF VISIONARY LEADERS

Hon. Shri. Ajit A. Pawar
Vice President

Hon. Shri. Shashikant S. Sutar
Vice President

Hon. Mrs. Pramila B. Gaikwad
General Secretary

Hon. Shri. Sandeep S. Kadam
Joint Secretary

Hon. Adv. Bhagwanrao B. Salunke
Joint Secretary

Hon. Shri. Vijaysinh Y. Jedhe
Treasurer

Message from Principal's Desk

Dr. S. B. Thakare

Principal, APCOER

Dear Students, Faculty, and Alumni,

It is with great pride and joy that I extend my heartfelt greetings to all readers of this year's college magazine. Our institution continues to be a beacon of learning, creativity, and innovation, and this magazine is a testament to the hard work and dedication of our students and faculty.

This publication not only showcases the academic and extracurricular achievements of our students but also reflects the vibrant spirit of our college community. Each article, poem, and photograph contained within these pages represents the diverse talents and perspectives that thrive on our campus.

As we navigate an ever-changing world, I encourage each of you to continue pushing the boundaries of knowledge, to remain curious, and to embrace the challenges and opportunities that lie ahead. Our college has always been a place where ideas are born, nurtured, and brought to fruition, and I have no doubt that our students will continue to make us proud in all their future endeavors.

I would like to express my gratitude to the editorial team, the contributors, and everyone involved in the creation of this magazine. Your efforts have truly created something special that will be cherished by the entire college community.

Wishing you all success in your future endeavors and hoping that this magazine inspires you as much as it has inspired me.

AKHIL BHARATIYA MARATHA SHIKSHAN PARISHAD'S

ANANTRAO PAWAR COLLEGE OF ENGINEERING & RESEARCH

Department of Electronics & Telecommunication

Chief Editor: Prof. Shailesh Hajare (HOD E&TC Department)

Editors: Prof. Bhushan Bhokse (Assistant Professor E&TC Department)

Student Members: Mr. Bhave Shreyas (BE E&TC)

Mr. Gaikwad Rshukesh (TE E&TC)

Miss. Kale Shraddha (SE E&TC)

Department at a glance

Since the invention of transistor at Bell Laboratories in 1947, the field of electronics has grown exponentially and it continues to grow. From a simple Transistor IC, now this Digital World is witnessing million transistor ICs. Similarly, the communication engineering has progressed tremendously from the days of Alexander Graham Bell to the Internet of Things (IOT's). Together. These two areas touch upon every phase of human life.

The "ELECTRONICS AND TELECOMMUNICATION ENGINEERING" Course was started in 2012. The goal of the department is to provide the students with a techno-excellent education in the field of electronics and telecommunication. Innovation, orientation and an ever expanding base serve as a firm foundation for the edifice for the latest development in the Department of E&TC.The department employs faculty members with high academic & industrial experience. The Department is imparting the required technical and practical knowledge to the students. The Department has well equipped laboratories with the latest of kits and equipment available so as to give practical hands on experience to our students. Regular monitoring of conduct of the academic activities is carried out to ensure presence and learning outcomes of students. The equipment available in the labs is upgraded as an ongoing process so as to keep pace with the latest developments in the field of Electronics & Telecommunication Engineering. An effort is made to groom these students not only to become successful E& TC Engineers but also top notch professionals. Industry institution interaction is also maintained by organizing guest lectures, seminars, and professional development workshops, by experts.

VISION

To strive students for affirming quality through innovation in technical education.

MISSION

1. To contribute in magnified education that enumerates and accomplishes brilliance in teaching learning process and innovation.

2. To create passion amongst students for contributing to research by providing industry exposure.

3. To inspire students and faculty by providing them various opportunities with industry oriented learning

4. To develop professional attitude, moral and ethical values among students for society

PROGRAM SPECIFIC OUTCOMES (PSO)

1. Analyze and design electronic circuits and machines for a given specification and function.

2. Simulate and implement functional blocks of hardware and software designs for applications using signal processing, Communication, Computer network and Control systems.

3. Analyzing social awareness and professional ethics to have successful career and to sustain passion and zeal for real world applications as an entrepreneur.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO 1 - Core Knowledge - To design & develop solid foundation of ETC engineering to solve technical problems.

PEO 2 – Placement and Higher Education - To design an ability to competent with strong technological Knowledge to solve industrial problems and make successful career in higher studies.

PEO 3 - Professional capability - To empower graduates for good communication soft skills and ethics to Work in multidisciplinary fields.

PROGRAM OUTCOMES (PO)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change.

Message from HOD's Desk

Prof. Shailesh Hajare

HOD, E&TC Department

Dear Readers,

I am pleased to welcome you to this edition of our E&TC department magazine. As we celebrate the remarkable achievements and innovations within our community, I am filled with pride for the dedication and creativity exhibited by our students and faculty.

This issue features exciting projects, insightful research, and upcoming events that reflect our commitment to advancing knowledge in engineering and technology. I encourage you to engage with the content, share your experiences, and contribute to our vibrant community.

Thank you for your ongoing support and enthusiasm. Together, let's continue to inspire and innovate!

Message from Magazine coordinator's Desk

Dear Readers,

Welcome to the latest edition of our E&TC department magazine! As the magazine coordinator, I am excited to share with you the incredible stories, achievements, and innovations happening within our community.

In this issue, you'll find a variety of articles highlighting student projects, faculty research, and upcoming events that showcase the spirit of collaboration and excellence that defines our department. Your engagement and feedback are vital to us, so we encourage you to share your thoughts and experiences.

Thank you for being an essential part of our journey. I hope you enjoy reading and find inspiration in these pages!

Prof. Bhushan Bhokse

Assistant Professor, E&TC Department

Faculty List

Sr. No.	Name of the Faculty	Specialization	Designation
1	Prof. S.S. Hajare	E&TC	Head of Department
2	Mr. Sudarshan Vithalrao Natu	Electronics and Telecommunication	Assistant Professor
3	Prof. Snehal Mohan Veer	Digital Signal Processing	Assistant Professor
4	Dr. Shaila Subbaraman	Electronics and Telecommunication	Professor
5	Prof. Sharad Sarjerao Jagtap	VLSI Design and Technology	Assistant Professor
6	Prof. Vaishali Venudhar Bhimte	VLSI Design	Assistant Professor
7	Prof. B.C. Bhokse	Communication Systems	Assistant Professor
8	Dr. Ganesh Karbhari	Embedded Systems	Assistant Professor
9	Prof. V.R. Ghiye	Embedded Systems	Assistant Professor
10	Prof. S.S. Salvekar	Microwave Engineering & Biomedical Engineering	Assistant Professor
11	Prof. S.V. Halde	Digital Signal Processing	Assistant Professor

Supporting Staff

Sr. No.	Name of the Faculty	Designation
1.	Mrs. Ashwini Joshi	Lab Assistant
2.	Mr. Ishwar Kshirsagar	Peon

Articles

Article

Sr.No	Name Of The Article	Page No.
1	Revolutionizing Agriculture: The Promise of Smart Farming and Irrigation	15
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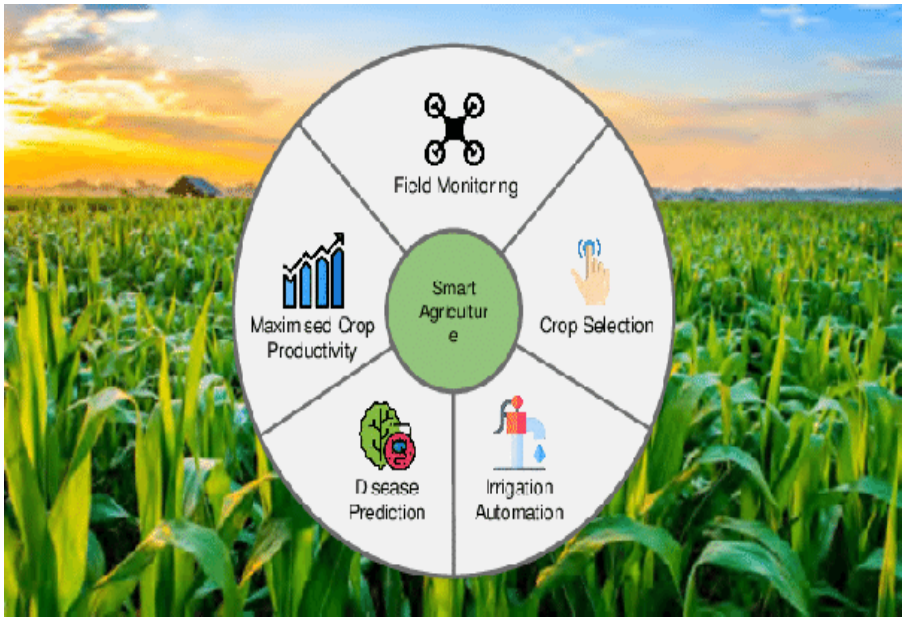
Revolutionizing Agriculture: The Promise of Smart Farming and Irrigation

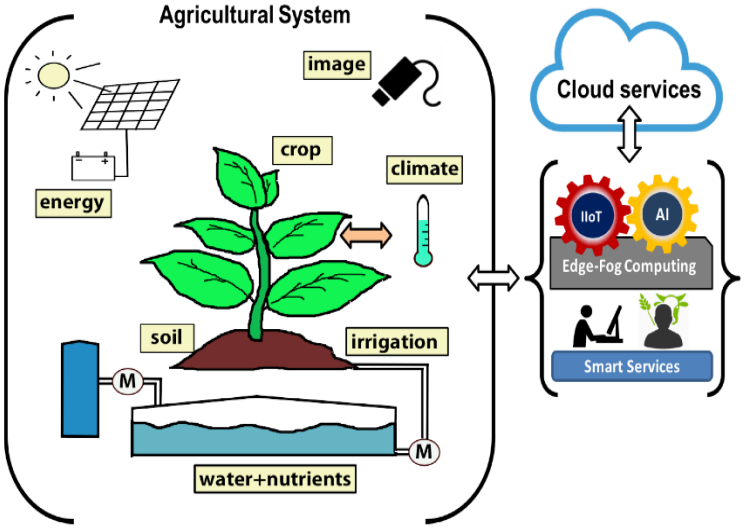
In the heartlands of our world, where vast expanses of land stretch into the horizon, a silent revolution is underway. It's not marked by rallies or protests but by the quiet hum of technology working in harmony with nature. This revolution is called Smart Farming, and at its core lies the promise of transforming agriculture through innovative irrigation techniques. Gone are the days when farmers relied solely on guesswork and tradition to tend their crops. Today, they are equipped with an array of sensors, drones, and data analytics tools that provide real-time insights into every aspect of their fields. This marriage of agriculture and technology, often referred to as Smart Farming, holds the key to addressing the challenges of food security, water sc6arcity, and climate change.



At the heart of Smart Farming lies the revolution in irrigation practices. Water, the elixir of life for crops, is a finite resource that must be used judiciously. Traditional irrigation methods, such as flood irrigation, often result in significant water wastage due to inefficiencies in delivery and distribution. Moreover, they can lead to soil erosion and waterlogging, further exacerbating environmental degradation. Enter smart irrigation systems – a beacon of hope for sustainable agriculture. These systems leverage cutting-edge technologies like IoT (Internet of Things), AI (Artificial Intelligence), and machine learning to optimize water usage based on precise data inputs. Soil moisture sensors measure the exact moisture content at different depths, weather stations predict rainfall patterns, and crop sensors monitor plant health in real-time.

This wealth of data enables farmers to tailor their irrigation schedules with pinpoint accuracy, delivering the right amount of water to the right place at the right time. One such example is the use of drip irrigation, a method where water is delivered directly to the roots of plants through a network of tubes and emitters. This not only minimizes water loss through evaporation but also prevents soil erosion and nutrient leaching. Furthermore, by automating the system with IoT devices, farmers can remotely monitor and control irrigation schedules from their smartphones, saving time and labor while maximizing

efficiency. But the benefits of smart irrigation extend beyond water conservation. By optimizing moisture levels, these systems promote healthier plant growth and higher yields. Studies have shown that crops grown under precision irrigation are not only more resilient to drought but also exhibit better nutrient uptake and pest resistance. This translates into increased profitability for farmers and a more sustainable supply of food for consumers.



Moreover, smart irrigation plays a crucial role in mitigating the impact of climate change on agriculture. With erratic weather patterns becoming the new norm, farmers face unprecedented challenges in managing water resources. By harnessing the power of data-driven insights, they can adapt their irrigation practices in real-time to cope with droughts, floods, and other extreme weather events.

However, the widespread adoption of smart irrigation faces several hurdles, including upfront costs, technical expertise, and connectivity issues in remote areas. Governments, NGOs, and private sector stakeholders must work together to overcome these barriers through financial incentives, capacity building programs, and infrastructure development initiatives.

Prof. Sharad Jagtap

E&TC Department

Power BI

Power BI is a technology-driven business intelligence solution for presenting actionable information by analyzing and visualizing raw data. To assist an organization in making data-driven decisions, it integrates best practices, data visualization, and business analytics. It converts data from different sources to build interactive dashboards and Business Intelligence reports.

Following are the Features of Power BI

1. Access to Volumes of Data from Multiple Sources
2. Interactive UI/UX Features
3. Exceptional Excel Integration
4. Accelerate Big Data Preparation with Azure
5. Turn Insights into Action
6. Real-time Stream Analytics

Advantages of Power BI

1. User-friendly interface: Power BI has an intuitive interface allowing users to visualize and analyze data easily.
2. Data integration: Power BI allows users to easily integrate data from various sources, including Excel, SQL Server, and cloud-based sources like Azure and Salesforce.
3. Customizable dashboards: Users can create customized dashboards and reports to display data in a way that is meaningful to them.
4. Real-time data: Power BI supports real-time data processing, which means users can view up-to-date data in their dashboards and reports.
5. Collaboration: Power BI allows users to share their dashboards and reports with others, making collaborating on data analysis projects easy.

Prof. Vaishali Bhimte

E&TC Department

The Power of Optical Communication

As our digital world demands faster and more reliable data transmission, optical communication has emerged as a revolutionary solution. Utilizing light waves to transmit information, this technology offers unparalleled speed and efficiency compared to traditional electrical signals.

How It Works

Optical communication primarily relies on fiber optic cables made from glass or plastic fibers. These cables allow light signals to travel long distances with minimal loss. Information is encoded onto the light using various modulation techniques, enabling high-bandwidth data transfer at the speed of light.

Applications and Benefits

1. Telecommunications: Optical communication forms the backbone of high-speed internet networks, connecting millions globally.

2. Medical Technology: Techniques like optical coherence tomography (OCT) enhance non-invasive diagnostic procedures.

3. Data Centers: Fiber optics improve data transfer rates and energy efficiency, reducing operational costs.

The advantages are clear: high bandwidth, long-distance transmission, immunity to electromagnetic interference, and lower energy consumption make optical communication an attractive choice across industries.

Future

As we move toward an increasingly connected future with technologies like 5G and the Internet of Things (IoT), the role of optical communication will only expand. Ongoing innovations promise to make this technology more accessible and efficient, paving the way for a brighter, more connected world.

In a rapidly evolving digital landscape, optical communication shines as a beacon of progress, illuminating the path forward.

Mr. Gaikwad Rshukesh

(TE E&TC)

The Rise of Automation in Robotics: Shaping the Future

Automation in robotics is transforming industries and reshaping the way we work and live. By integrating advanced technologies such as artificial intelligence, machine learning, and IoT, automated robots are becoming increasingly capable, efficient, and intelligent.

How It Works

At the core of robotic automation is the ability of machines to perform tasks with minimal human intervention. This involves the use of sensors, cameras, and software algorithms that enable robots to perceive their environment, make decisions, and execute tasks autonomously. From assembly lines to warehouses, robots are designed to streamline operations and enhance productivity.

Key Applications

1. **Manufacturing**: Robots are revolutionizing production lines, performing repetitive tasks with precision and speed, thereby reducing human error and increasing efficiency.
2. **Healthcare**: Automated robots assist in surgeries, manage logistics in hospitals, and even provide companionship to patients, improving healthcare delivery.
3. **Agriculture**: Autonomous drones and harvesters are optimizing farming practices, monitoring crops, and increasing yield while minimizing labor costs.

Benefits of Automation

- **Increased Efficiency**: Robots can work around the clock, leading to higher output and reduced operational costs.
- **Enhanced Safety**: By taking over hazardous tasks, robots help protect human workers from dangerous environments.
- **Consistency and Quality**: Automation ensures uniformity in tasks, improving the overall quality of products and services.

Challenges Ahead

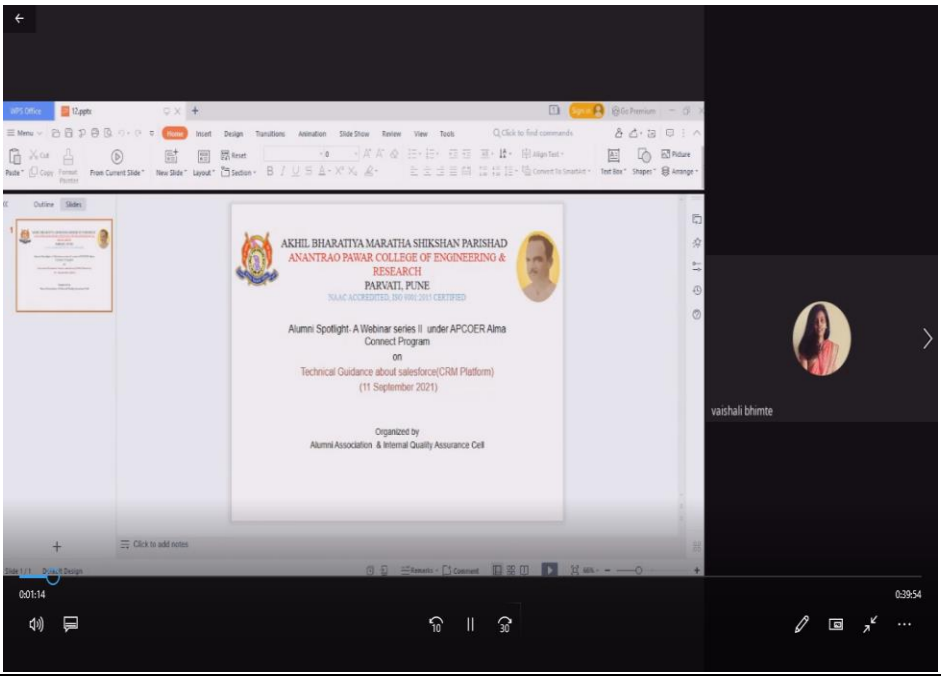
Despite the numerous benefits, challenges remain, including the initial investment costs and concerns over job displacement. However, as robots take on more repetitive and dangerous tasks, humans can focus on more strategic and creative roles.

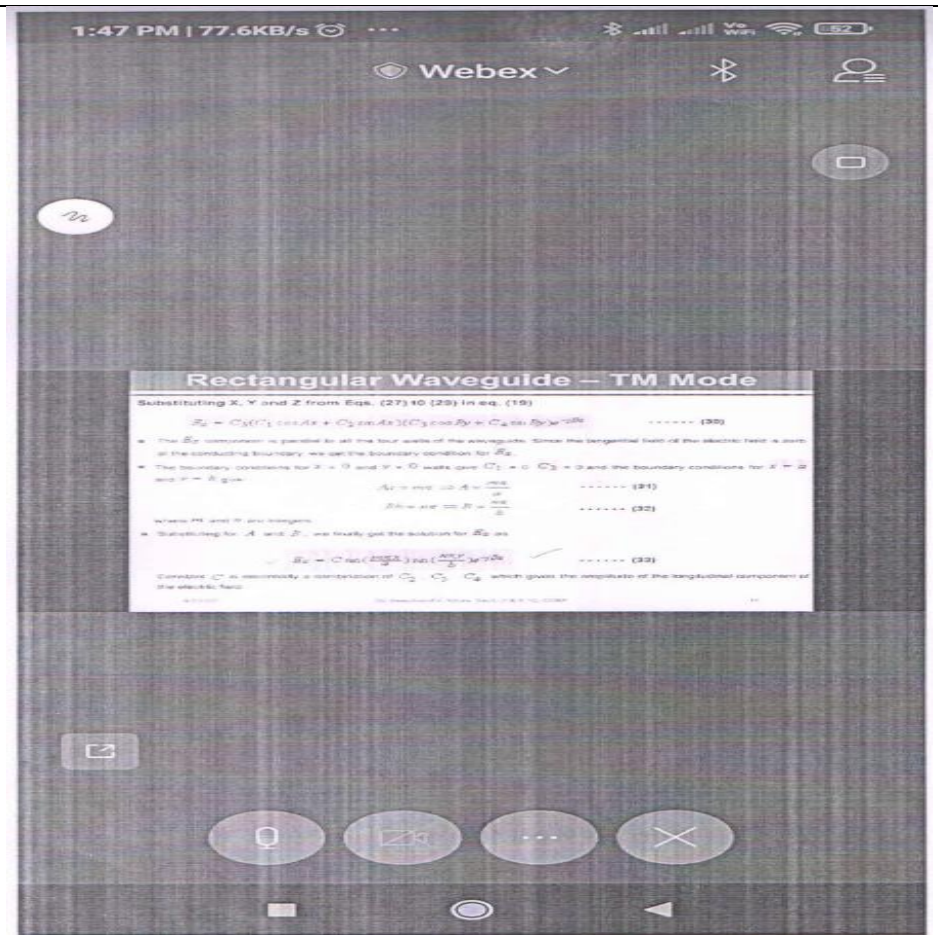
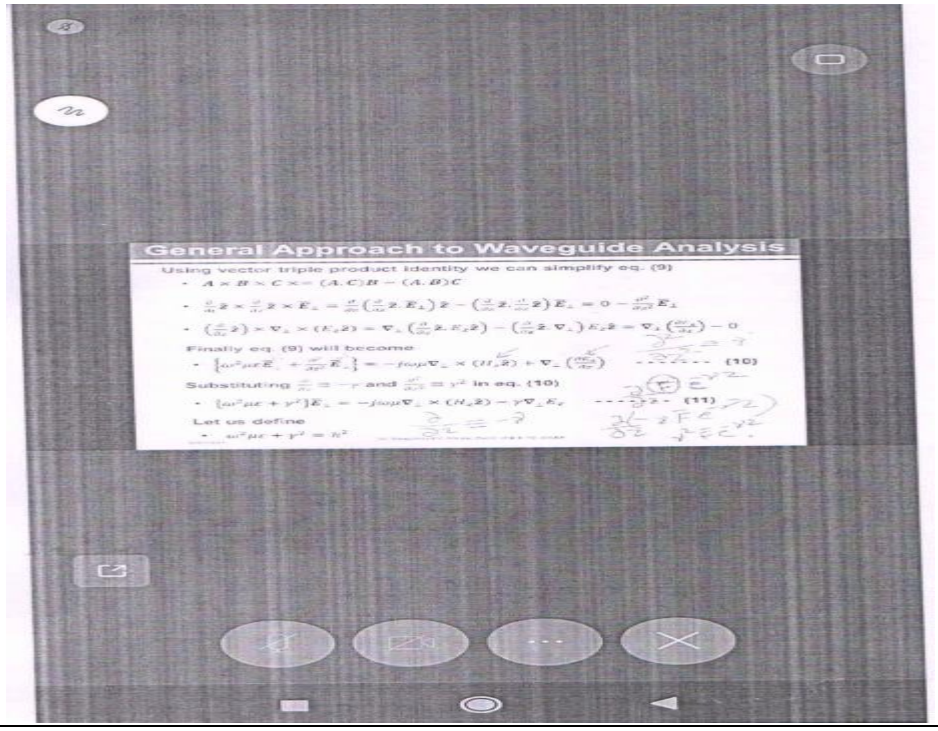
Mr. Parikshit Mishra

(BE E&TC)

Department at a Glance

Events Conducted and Participated by the Department Students and Faculty Members:

Sr. No	Name Of the Event	Date	Photo
1	Alma Connect 2021	11/09/2021	 

2.	COEP Expert Lecture on Radiation and microwave technique	30/09/2022	 

3	NSS Activity	04/01/2022 - 10/01/2022	

4	Tree Plantation		

			राष्ट्रीय सेवा योजना Stay Alert, Stay Safe STOP THINK ACT ROAD SAFETY ACTIVI Wear helmets, ride safely!

FDP/SDP Conducted

Sr. No	Date	Name of the FDP
1	11/11/2021 to 16/11/2021	ARDUINO
2	20/12/2021 to 24/12/2021	C & CPP
3	21/01/2022 to 27/01/2022	eSIM
4	27/04/2022 to 02/05/2022	Scilab
5	05/05/2022 to 10/05/2022	Python 3.4.3

Toppers from Batch 21-22

BE Class Toppers

Rank	Name Of The Student	CGPA
1st	Bhave Shreyas D.	9.1
	Satpute Sahil A.	
2nd	Thakur Subham P.	9.02

TE Class Toppers

Rank	Name Of The Student	CGPA
1st	Tekale Rohan R.	9.64
2nd	Randhe Pranali M.	9.36
3rd	Rushikesh Gaikwad	9.29

SE Class Toppers

Rank	Name Of The Student	CGPA
1st	Kosumbkar Krunal U.	8.98
2nd	Shinde Apeksha K.	8.77
3rd	Kale Shraddha A.	8.1

A.B.M.S.PARISHAD'S

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