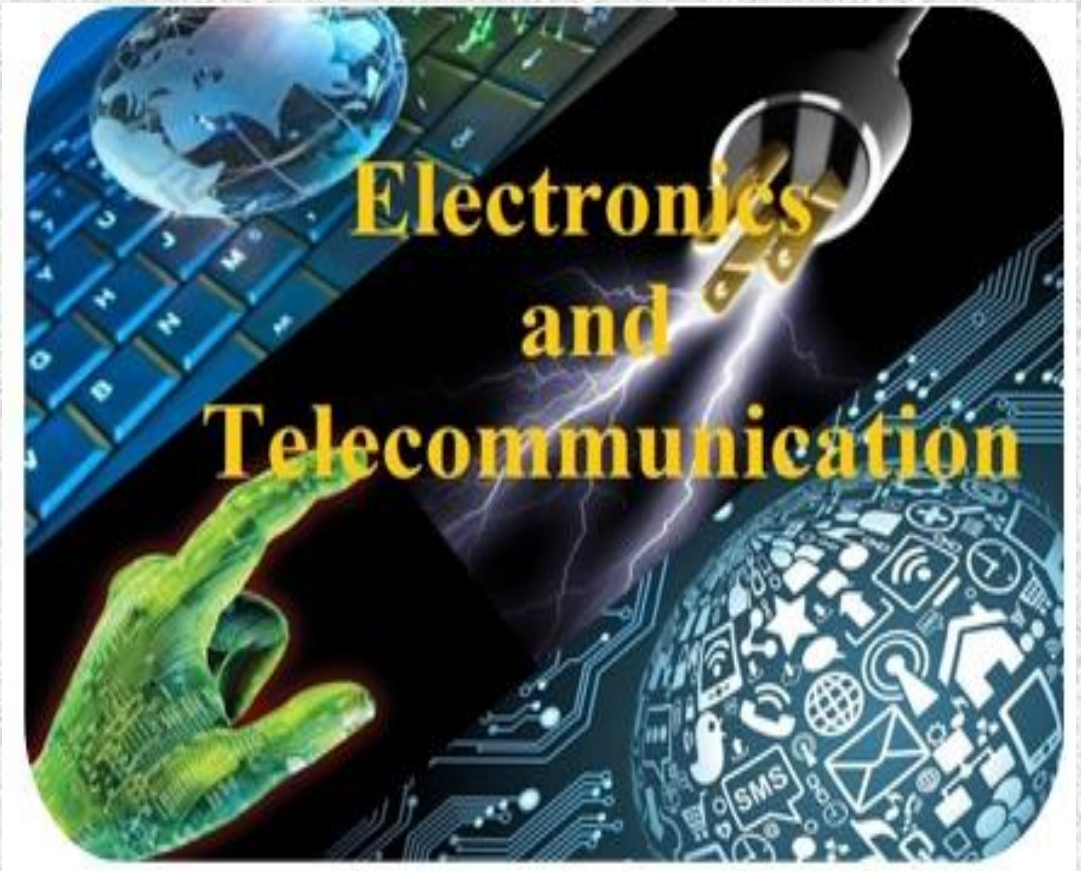
Department of Electronics & Telecommunication

COMMUNICA – 2022-23



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.

Warm regards,

AKHIL BHARATIYA MARATHA SHIKSHAN PARISHAD'S

ANANTRAO PAWAR COLLEGE OF ENGINEERING & RESEARCH

Department of Electronics & Telecommunication

Chief Editor: Dr. Soojey Deshpande (HOD E&TC Department)

Editors: Prof. Ashwini Suryawanshi (Assistant Professor E&TC Department)

Student Members: Miss. Shinde Apeksha (TE E&TC)

Mr. Kosumbkar Krunal (TE E&TC)

Mr. Tilak Kannadiar (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 modelling 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

Dr. S. R. Deshpande

HOD, E&TC Department

Dear Readers,

It gives me great pleasure to welcome you to the latest edition of our E&TC magazine. As we navigate through an era of rapid technological advancements, our department remains committed to fostering excellence in education, research, and innovation. In the ever-evolving landscape of E&TC engineering, our focus continues to be on providing our students with a holistic learning experience that equips them with the knowledge, skills, and mindset to thrive in a dynamic and interdisciplinary environment. Through our rigorous academic curriculum, state-of-the-art laboratories, and industry collaborations, we strive to nurture future-ready engineers who are well-prepared to tackle the challenges and opportunities of the digital age.

In this edition of the magazine, you will find a diverse range of articles, research papers, and insights from our faculty, students, and alumni. From cutting-edge research projects to industry partnerships and student initiatives, these contributions reflect the vibrancy and ingenuity of our E&TC community.

I would like to extend my gratitude to our faculty members for their dedication and expertise in shaping the minds of our students and advancing the frontiers of knowledge through their research endeavours. I would also like to commend our students for their enthusiasm, creativity, and commitment to excellence, both inside and outside the classroom. As we look ahead, let us continue to embrace innovation, collaboration, and lifelong learning. Together, we can harness the transformative power of E&TC engineering to address global challenges, drive economic growth, and enhance the quality of life for all. Thank you for your continued support and engagement with our department. I invite you to explore the pages of this magazine and join us on our journey of discovery and innovation.

Message from Magazine coordinator's Desk

Prof. Ashwini Suryawanshi

Assistant Professor, E&TC Department

Dear Readers,

As the Magazine Coordinator, I am excited to present to you a compilation of insightful articles, research highlights, and student achievements that showcase the vibrancy and excellence of our department.

Producing this magazine has been a collaborative effort, bringing together the creative talents and scholarly contributions of our faculty, students, and staff. I am immensely proud of the dedication and enthusiasm demonstrated by everyone involved in this endeavour, from the writers and editors to the designers and photographers. I would like to express my gratitude to our editorial team for their meticulous efforts in curating and refining the content of this magazine. Their commitment to excellence has ensured that we present a publication that not only informs but also inspires and engages our readers. To our contributors, I extend my heartfelt appreciation for sharing your expertise, experiences, and insights with us. Your contributions enrich the pages of this magazine and contribute to the collective knowledge and spirit of innovation that defines our department.

Finally, I would like to thank our readers for your continued support and interest in our departmental activities. I hope that you find this magazine to be both informative and enjoyable, and that it serves as a testament to the outstanding work being done within our E&TC community.

Thank you for being a part of our journey.

Faculty List

Sr. No.	Name of the Faculty	Specialization	Designation
1	Dr. S.R.Deshpande	Embedded System Design	Head of Department
2	Mr. Sudarshan Vithalrao Natu	Electronics and Telecommunication	Assistant Professor
3	Prof. Snehal Mohan Veer	Advanced Communication Technology	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. Ashwini A.Suryawanshi	Electronics and Communication	Assistant Professor
8	Prof. Prachi R. Upasani	VLSI Design	Assistant Professor
9	Prof. Nitin Gaikwad	Digital System	Assistant Professor

Supporting Staff

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

Articles

Article

Sr. No	Name Of The Article	Page No.
1	Evolution in Semiconductor Industry	7
2	5G technology	8
3	The Block chain Upset: Disclosing India's Way to Development	9
4	Edge Computing	11

Evolution in Semiconductor Industry

The Indian semiconductor industry has seen remarkable growth and development over the past 75 years, evolving from its early stages to becoming a promising player in the global semiconductor market. Here's a brief review of its journey

In the early years there was limited domestic production .Only few Indian companies were producing Germanium & Silicon semiconductors. India primarily focused on research and development activities during this period. The semiconductor industry in India emerged high in the 1980s. The Indian government recognized the importance of the semiconductor industry. The Semiconductor Complex Ltd. (SCL) was established in Mohali in 1983 as a public sector undertaking; which was a pioneer in semiconductor manufacturing. India gradually start to attract foreign investments and collaborations in the semiconductor sector, Companies like Texas Instruments, Intel, and STMicroelectronics set up their operations in India during this period. The Indian semiconductor industry saw significant growth in design and research and development (R&D). Several Indian companies emerged as key players in semiconductor design and development, providing services to global semiconductor hubs. The Indian semiconductor industry continued to grow, with a strong emphasis on innovation, research, and development. The government launched initiatives like the National Policy on Electronics (NPE) and the Make in India campaign to boost domestic manufacturing and reduce dependency on imports.

There has been a surge in startups and smaller companies in the semiconductor space, focusing on design, IP development, and fabless chip manufacturing. Additionally, India has entered in the field of nanotechnology, which is closely related to the semiconductor industry. Despite significant growth, the Indian semiconductor industry faces challenges like infrastructure constraints, supply-chain management, skill availability and global competition. However, there are vast opportunities in areas such as IoT (Internet of Things), automotive electronics, artificial intelligence (AI), and 5G technology.

The government's initiatives, private sector investments, and a focus on R &D are expected to drive the Indian Semiconductor Industry's growth on the global stage

Prof. Prachi Upasani

Assistant Professor, E&TC Department

5G technology

5G technology is the fifth generation of mobile network technology, succeeding the previous generations like 4G LTE. It represents a significant leap forward in terms of speed, capacity, latency, and connectivity. Here's a breakdown of key aspects of 5G technology:

Speed: 5G promises to deliver significantly faster data speeds compared to its predecessors. While actual speeds may vary depending on factors like network congestion and deployment, 5G has the potential to achieve peak download speeds of several gigabits per second (Gbps), enabling ultra-fast downloads and seamless streaming of high-definition content.

Low Latency: One of the defining features of 5G is its low latency, which refers to the delay between sending and receiving data. 5G networks aim to achieve ultra-low latency, reducing response times to as low as one millisecond (ms) or even lower. This low latency is crucial for applications requiring real-time responsiveness, such as autonomous vehicles, remote surgery, and augmented reality/virtual reality (AR/VR) experiences.

High Capacity: 5G networks are designed to support a massive number of connected devices simultaneously. This high capacity is essential for accommodating the growing number of IoT devices, smart sensors, and other connected gadgets expected to be part of the Internet of Things (IoT) ecosystem.

Enhanced Connectivity: With advanced antenna technologies like massive MIMO (Multiple Input Multiple Output) and beam forming, 5G networks can provide better signal strength and coverage, even in dense urban areas or indoors. This improved connectivity ensures reliable and consistent performance across various environments.

Network Slicing: 5G introduces the concept of network slicing, allowing operators to partition their network into multiple virtual networks optimized for specific use cases or applications. This enables customized network configurations tailored to the requirements of different industries,

such as enhanced mobile broadband (EMBB), massive machine-type communication (MMTC), and ultra-reliable low-latency communication (URLLC).

Ecosystem Transformation: 5G technology is expected to drive innovation and transformation across various industries, including healthcare, automotive, manufacturing, entertainment, and smart cities. It enables new applications and services such as remote patient monitoring, autonomous vehicles, smart factories, and immersive multimedia experiences.

Overall, 5G technology represents a significant advancement in mobile communications, offering faster speeds, lower latency, higher capacity, and enhanced connectivity. Its deployment is expected to unlock new opportunities for innovation and enable transformative applications and services that can benefit individuals, businesses, and societies as a whole.

Prof. Ashwini Suryawanshi

Assistant Professor, E&TC Department

The Blockchain Upset: Disclosing India's Way to Development

Introduction:

As of late, India has arisen as a hotbed for blockchain improvement, encouraging a lively environment of new businesses, government drives, and corporate joint efforts. The capability of blockchain innovation to upset enterprises, upgrade straightforwardness, and smooth out tasks has caught the creative mind of business visionaries, policymakers, and technologists the same. This article digs into the advancement of blockchain improvement in India, featuring key patterns, difficulties, and open doors that have formed its direction.

Spearheading Drives:

India's excursion into blockchain improvement picked up speed with spearheading drives by both general society and confidential areas. The foundation of the Blockchain Region in Telangana and the Blockchain Focus of Greatness in Kerala filled in as impetuses for development, giving a favorable climate to new companies and scientists to investigate blockchain applications across different spaces. In addition, government-drove projects like IndiaChain expected to use

blockchain for improving straightforwardness, security, and effectiveness in administration processes.

Startup Environment:

India's blossoming startup biological system plays had a urgent impact in driving blockchain development. New businesses the nation over have been utilizing blockchain innovation to address different difficulties, going from production network the board and medical services to fund and personality the executives. With a developing number of blockchain-centered gas pedals, hatcheries, and subsidizing valuable open doors, Indian new companies have had the option to quickly model and scale blockchain arrangements, drawing in revenue from financial backers and worldwide partnerships.

Administrative Scene:

While the Indian government has shown excitement towards blockchain innovation, the administrative scene has been described by equivocalness and vulnerability. The Hold Bank of India's (RBI) careful methodology towards digital currencies has prompted administrative difficulties for blockchain new businesses working in the cryptographic money space. Be that as it may, late turns of events, for example, the High Court's decision toppling the RBI's prohibition on digital money exchanging, have given a promising sign to a more helpful administrative climate.

Industry Reception:

Notwithstanding administrative difficulties, a few Indian enterprises have embraced blockchain innovation to drive development and effectiveness. In the banking and monetary area, blockchain-fueled answers for exchange money, settlements, and advanced character the board are getting some momentum, promising to smooth out activities and decrease costs. Also, businesses like production network the executives, medical services, and land are investigating blockchain applications to upgrade straightforwardness, recognizability, and security in their activities.

Ability Pool and Joint effort:

India's rich ability pool of programming designers, engineers, and blockchain aficionados has been instrumental in driving blockchain improvement forward. Colleges and instructive organizations have presented blockchain courses and exploration programs, supporting the up and coming age of blockchain trend-setters. Besides, coordinated efforts between the scholarly community, industry, and government bodies have worked with information sharing, expertise improvement, and cooperative exploration drives, cultivating a lively blockchain environment in the country.

Mr. Rahul Shamrao Zende

T.E E&TC

Edge computing

Edge computing is a distributed computing paradigm that moves data storage and computation closer to the point of demand, which is usually at the network's edge, close to the data generating source. Data is routed to centralized data centers for processing and storage in typical cloud computing architectures. In contrast, edge computing processes data locally on servers or on edge devices like routers, gateways, or Internet of Things Devices, and then transfers it to a centralized data centre. Edge computing has various important features and benefits, including the following:

1. **Low Latency**: By processing data closer to its source, edge computing reduces the time it takes for data to travel between the source and the processing location. This low latency is critical for applications that require real-time or near-real-time responses, such as autonomous vehicles, industrial automation, and augmented reality.
2. **Bandwidth Optimization**: Edge computing helps to reduce the amount of data that needs to be transmitted over the network to centralized data centers, thus optimizing bandwidth usage. This is particularly important in scenarios where network bandwidth is limited or expensive.
3. **Improved Reliability**: By distributing computing resources across multiple edge locations, edge computing can improve the reliability and resilience of applications. If one edge node fails or experiences network issues, other nodes can continue to operate independently.

4. **Data Privacy and Security**: Edge computing allows sensitive data to be processed locally, without the need to send it to centralized data centers. This helps to address privacy concerns and can enhance data security by reducing the exposure of data to potential threats during transit.
5. **Scalability**: Edge computing architectures can be highly scalable, allowing organizations to deploy additional edge nodes as needed to handle increasing workloads or to support additional devices and users.
6. **Offline Operation**: Edge computing enables devices to continue functioning even when they are disconnected from the internet or centralized servers. This is particularly useful for applications in remote or isolated environments where network connectivity may be unreliable or unavailable.

Edge computing has numerous applications across various industries, including:

- **Internet of Things (IoT)**: Edge computing is essential for IoT applications, where large numbers of devices generate vast amounts of data that need to be processed and analyzed in real-time.
- **Industrial Automation**: Edge computing enables real-time monitoring and control of industrial processes, improving efficiency, safety, and productivity.
- **Smart Cities**: Edge computing can power smart city applications such as traffic management, public safety, and environmental monitoring.
- **Telecommunications**: Edge computing plays a crucial role in supporting 5G networks by reducing latency and enabling new services and applications.

Overall, edge computing is a transformative technology that is reshaping how data is processed, stored, and analyzed, enabling new possibilities for innovation and efficiency across a wide range of industries.

Miss. Shinde Apeksha (TE E&TC)

Mr. Kosumbkar Krunal (TE E&TC)

Events

Department at a Glance

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

Sr. No	Name Of the Event	Date	Photo
1	Engineer's Day Celebration	15/09/2022	
2	Navratri Celebration	17/09/2022	

3	University Level Football Competition	13/10/2022	
4	Anant Samrudhii Cloth Donation Camp	14/10/2022	

5	Bright Star Electronics Industrial Visit	26/11/2022	
6	AVISHKA R-2022 Competition	07/12/2022	

7	Autofina Robotics Training Workshop	19/12/2022 - 24/12/2022	
8	NIRBHAYA KANYAAB HIYAN	22/02/2023	

9	SPARKTECH 2023	14/02/2023 - 17/02/2023	
10	National Conference on IOT & Embedded Systems organized by NIT Kurukshetra	24/02/2023 - 25/02/2023	

11	Faculty Feliciation By Principal for Prize winning at National Conference on IOT & Embedded Systems organized by NIT Kurukshetra	27/02/2023	
12	LATEX Workshop for Project Preperation	03/03/2023	

13	Women's Day Celebration	08/03/2023	
14	TECHNOTHON 2023	11/04/2023 - 14/04/2023	

15	Vighnaharta Technologies Pvt. Ltd	24/06/2023	

Academics

Toppers from Batch 22-23

BE Class Toppers

Rank	Name Of The Student	CGPA
1st	Mr.Tekale Rohan R.	9.18
2nd	Miss. Randhe Pranali M.	8.9
3rd	Mr. Waghmare Pavan M.	8.68

TE Class Toppers

Rank	Name Of The Student	CGPA
1st	Miss. Shinde Apeksha K.	8.81
2nd	Miss. Kale Shraddha A.	8.19
	Mr. Kosumbkar Krunal U.	
3rd	Miss. Kasar Anuja D.	7.24

SE Class Toppers

Rank	Name Of The Student	CGPA
1st	Mr. Kannadiar Tilak M.	7.86
2nd	Miss. Ghawad Nikita P.	7.23
3rd	Miss. Pawar Vaishnavi P.	7

Papers Published by Students

Sr. No	Name of the Paper	Name of Faculty/ Student
1	Smart Ai Based Solutions And Services For College Library	Prof. S. M. Veer
		Mr. Aneksha Bhosale
		Miss Pranjali Randhe
		Mr. Rohan Tekale
		Mr. Rushikesh Shinde
2	A Review On Smart Polyhouse Development And Control Using IOT	Prof. Sharad Jagtap
		Mr. Kiran Jadhav
		Mr. Tushar Nagtilak
		Mr. Tejas Nakhate
		Mr. Sandesh Thite
3	Charging Using Coin Insertion	Prof. A.A.Suryawanshi
		Mr. Pavan Waghmare
		Miss. Swapna Sarvade

A.B.M.S.PARISHAD'S

ANANTRAO PAWAR COLLEGE OF ENGINEERING & RESEARCH.

Address: S. No. 103, Shahu College Road, Parvati, Pune - 411009.

College TELE-FAX Number 020 24213929

College Phone Number: 020-24218901 (Office)

020-24218959 (Office)