Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap's

ASHOKRAO MANE POLYTECHNIC, VATHAR

Vathar tarf Vadgaon, Tal.- Hatkanangle, Dist.- Kolhapur 416112

Department of Computer Engineering

NEWSLETTER

VOL - X, ISSUE - I, DECEMBER 2024

THEME-CYBER SECURITY NEED OF GENERATION

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VISION OF DEPARTMENT

An eminent program to meet the growing needs of IT Industry and Society.

MISSION OF DEPARTMENT

- m1. Imparting quality education through a well designed curriculum which improves basic and disciplinary knowledge of the subject.
- m2. To train the students to design , develop and test emerging software system for industry and society.
- m3. To inculcate the spirit of teamwork innovation and professionalism among the students.
- m4. To train students with hands-on and soft-skills for their future jobs, higher studies and to be an entrepreneur.

CHIEF EDITOR
Dr. S. A. Lakade
EDITOR COMMITTEE :
Ms. S. R. Chougale

ABOUT INSTITUTE

Shri Balasaheb Mane Shikshan Prasarak Mandal Ambap's, Ashokrao Mane Polytechnic, Vathar Tarf Vadgaon (AMPV) was established in 2008 and is located near Kolhapur. This Institute has AICTE approval for the Seven Diploma courses. Under the visionary leadership and administration, AMPV has emerged as a leading technological institute and is perfect destination for quality technical education. The institute has NBA accredited Programmes, 100% placements in MNCs, best academic results, well established labs. The institute was also honoured with not able awards.

ABOUT DEPARTMENT

Department of Computer Engineering of Ashokrao Mane Polytechnic,Vathar tarf Vadgaon is established in 2008.The department is evolving over the year with upcoming technologies and upgraded industry based academics to become one of the active department of this institute.The focus of department is disciplined teaching on advanced computational methods for developing software, analyzing and solving complex tasks, designing database, cyber security tools in technology and science. Department get NBA accredation for the years 2017-2019 ,2019-2020 and 2020-2021.Its intake is 120 student's.Our department passout students are nearabout 120.Our department Alumni students are nearabout 600+. to The curriculum provided by our department is flexible and provide opportunities for students to emphasize specific areas of interest through their chooses of appropriate measure and technical elective . To create academic environment at departmental level we have a well maintained library with funds from management. The department has well equipped laboratories with latest hardware and software. The laboratory has 10KVA power backup facility for each computer and 300 MBPS airtel lease line.

Message from Principal Desk

Dr. Y. R. Gurav

Principal,
Ashokrao Mane Polytechnic ,
Vathar Tarf Vadgaon

Dear Readers,

I am very happy to note that the Department of Computer Engineering of Ashokrao Mane Polytechnic Vathar tarf Vadgaon, is releasing its Newsletter enumerating the various activities and achievements of their faculty and students.

Computer Engineering is a versatile and ever green branch of engineering. A computer engineer is a professional who develops software for mobile, medical devices, supercomputers and organization's test it, design a database, crate network and provide cyber security. Also it is having wide scope for upcoming technologies like AI & ML. I hope this newsletter will serve the purpose of reflecting all activities of department and it will inspire others to do their best. I congratulate all the students who have put their efforts in bringing this newsletter publication and also appreciate HOD and all faculty members for motivating their students towards this fulfilment. I wish each one of them in the departments success in all their endeavors.

Dear Students, if you are determined to work hard to achieve your goal, nothing in this world can deter you from achieving your goal. However, if at the outset you fail to achieve your goal, figure out if any change is needed in your goal setting as per your potential, work with great vigor. Don't stop to strive hard until you succeed, do smart work and see success will be yours. Telling reasons are easy equally easy is finding reasons but achieving success and sharpening your career is more important isn't it?
I wish best luck in all your endeavors.

Message from Editor's Desk

Dr. S. A. Lakade
H.O.D. Computer Engineering
Ashokrao Mane Polytechnic ,
Vathar Tarf Vadgaon

Greetings to faculties and friends!

"I feel very fortunate to have someone of him credentials & background leading our teaching & learning department." This newsletter has been named to pay tribute to his contribution to the field of Science & Engineering. This newsletter is an attempt to showcase the department profile and its technical and non- technical activities forever all growth of students. It is an attempt to encourage both faculties and Students to publish their technical work and share information about their extra curricular activities. I am thankful to our Principal and the Management for helping and guiding me in bringing out this newsletter. I also thankful to my students and colleagues for their help and support during this work. "The best leader is the one who has sense enough to pick good men to do what he wants done, and the self-restraint to keep from meddling with them while they do it." The Computer Engineering Department is striving towards the goals and providing innovative and quality education with high standard to achieve academic excellence.

I would like to advice all my students to first think 'inside the box' to be able to pursue their 'out of the box' goals. They should look for small improvements in their current setup and execute everything with perfection. Make full use of the educational facilities to ignite the spark within them so that they can fulfil their dreams in future.

Guru Purnima

On 20/07/2024, Department of Computer Engineering celebrated Guru Pournima with great enthusiasm and reverence. The event aimed to honor the guiding lights in our lives, including teachers, mentors, and spiritual leaders.

Teacher's Day

Teacher;s day is celebrated by the Department of Computer Engineering in the remembrance of Dr. Sarvapalli Radhakrushnan.Celebrating this event gives motivation and stage daring to students also it helps to enhance the communication skills in students.Number of students has enthusiastically taken participation in this event.Best teacher award among the participant students has distributed by Hon. Principal Prof.Y .R. Gurav and HOD Mr.S.A.Lakade.

Engineer's Day

Mokshgundam Visvesvaraya is regarded in India as one of the foremost civil engineers whose birthday,

15 September, is celebrated every year as Engineer's Day in India, Sri Lanka, and Tanzania. He is also often regarded as "the maker of modern Mysore" According to Prajavani, a Kannada language newspaper, he is also the most popular figure in the southern Indian state of Karnataka.

Web Desigining

Reel Master

Department of Computer Engineering in association with COMPESA has celebrated engineer's day followed with two state level technical events Web designing and Reel Master. In this event students of different engineering college has was participated. All students showed up their skills by building various websites and Reels Master competition. Student present different types of reels with emerging new trends as well as they shows their talent.

Also on this day student express their thoughts on great engineers. Head of the Department Dr. S. A. Lakade motivated the students in his speech. He explain how the evaluation of engineering has been done from past decades to till onwards. were the staff has given a wonderful message to students for becoming a great engineers in future.

Parents Meet

On 15/07/2024, Computer Engineering Department hosted a Parents' Meet with the aim of fostering better communication and collaboration between parents and the college community. The event provided a platform for parents to interact with faculty members, administrators, and learn more about their children's academic progress and overall development.

Expert Lecture

Expert Talk on
"Cyber Security and Personality Development".

The Department of Computer Engineering has arranged an expert talk on the subject "Cyber Security and Personality Development". It is mandatory expert talk as per curriculum of MSBTE. In expert talk Mr. AkshayKumar Bhore discussed on various topics like Emotional Intelligence, Stress Management, Body language, professional ethics, Image building, personality development, interview skills, time management, resume writing etc. also discussed need of this in future.

Expert Talk on
"Web Development"

The Department of Computer Engineering has arranged an expert talk on the subject "Web Development". It is mandatory expert talk as per curriculum of MSBTE. In expert talk Mr. Ranjit Hambirrao Pasale discussed on various technologies such as Back end and Front end technologies. Also discuss various job opportunities as Backend Developer and Frontend Developer. they introduce students various technical languages regarding frontend and backend technologies such as HTML,CSS,JAVASCRIPT,PHP,DATABASE,ORACLE , etc. students learned various concept and also how to workout with domain, Hosting and various process regarding

Industrial Visit

Industrial visit at Techno Bits Pvt. Ltd. , Kolhapur.

For practical exposure and career guidance, our department arranged industrial visits to several industries. These visits provided students with firsthand insights into the workings of various sectors and the opportunity to interact with industry professionals. This experience aims to bridge the gap between theoretical knowledge and real-world applications, helping students understand the skills and competencies required in their future careers.

NSS Activity

Ek Ped Maa Ke Naam Abhiyan

The "Ek Ped Maa Ke Naam Abhiyan" is a unique initiative that allows individuals to plant trees in the name of their mothers, combining environmental action with a personal touch. As part of this campaign, students of Ashokrao Mane Polytechnic Vathar Tarf Vadgaon took the initiative to participate individually, planting saplings at their homes, in local parks, or nearby areas.

Har Ghar Tiranga Abhiyan

"Har Ghar Tiranga Abhiyan" (Campaign) is an initiative under the larger Azadi Ka Amrit Mahotsav, launched by the Government of India to commemorate 75 years of India's independence. The campaign encourages citizens to display the national flag (Tiranga) at their homes to celebrate the spirit of patriotism and unity.

Eco-Friendly Ganesh Visarjan and Nirmalya Collection Campaign

The National Service Scheme (NSS) of Ashokrao Mane Polytechnic, organized an initiative titled "Eco-Friendly Ganesh Visarjan and Nirmalya Collection Campaign" aimed at promoting environmental awareness and sustainability during the Ganesh Chaturthi festival. This activity was led by NSS coordinators and volunteers across various local locations, emphasizing the importance of eco-friendly practices.

Ek Ped Maa Ke Naam Abhiyan

NSS committee of Ashokrao Mane Polytechnic, Vathar has arranged the "Fire Safety Training (Demo on awareness and handling of fire extinguisher)" under the NSS. The event is done by cooperation of the entire NSS committee member, staff and students dated 14 November 2024 as per the guidelines in Maharashtra state board of technical education.

Extra Curricular Activity

NSS Activity

Distribution of Diwali Faral

On behalf of Shri Balasaheb Mane Shikshan Prasarak Mandal, Ashokrao Mane Polytechnic Vathar, under the N.S.S. activity Diwali snacks were distributed to nomadic communities, sugarcane workers, as well as truck drivers in the states of Karnataka, Gujarat, Kerala, Madhya Pradesh, Uttar Pradesh through the department.

Tree Plantation (Vrukshotsav)

NSS committee of Ashokrao Mane Polytechnic, Vathar has arranged the "Tree Plantation (Vrukshotsav)" under the National Service scheme (NSS) as per the guidelines in circular of Maharashtra State Board of Technical Education(MSBTE), Mumbai

School Campaigning

Faculty members from our department visited nearby schools to inform 10th standard students about career guidance and diploma courses offered under the Maharashtra State Board of Technical Education (MSBTE). The admission process is straightforward, with eligibility requirements based on completion of the 10th standard. Diploma courses offer a pathway to both immediate job opportunities and further education. Students can also opt for lateral entry into degree programs after completing their diplomas. **This initiative aims to guide students in making informed career choices and exploring technical education options.**

Ms. S. R. Chougale
Lecturer

FACULTY SPEAK

Cyber Security: The Need of This Generation

Cybersecurity refers to the practice of protecting systems, networks, and programs from digital attacks. These attacks often aim to access, alter, or destroy sensitive information, extort money, or disrupt normal business processes.

Scope:
• Protecting data in digital environments.
• Ensuring secure online transactions.
• Safeguarding personal, organizational, and governmental systems.

Importance of Cybersecurity Today:
1. Explosion of Data Generation:
• Every minute, vast amounts of data are created, shared, and stored.
• Protecting sensitive personal and corporate data is crucial to maintain trust and prevent identity theft.
2. Increasing Cyber Threats:
• Global cybercrime damage is estimated to hit $10.5 trillion annually by 2025.
• Threat actors include hackers, state-sponsored groups, and insider threats.
3. Digital Transformation:
• The integration of digital tools in businesses, education, and healthcare makes them prime targets for attacks.
• Remote work has expanded attack surfaces.
4. IoT and Smart Devices:
• Billions of connected devices (IoT) increase the vulnerabilities in home, business, and public infrastructure.
5. Economic and National Security:
• Cybersecurity protects critical industries such as finance, power grids, transportation, and defense.

Future of Cybersecurity
Quantum Computing Threats, Lack of Awareness, Cost Barriers, Rapidly Evolving Threats, Global Collaboration , AI-Driven Threats,

FACULTY SPEAK

Ms. H. J. Patil
Lecturer

Neuromorphic Technology: The Next Step in AI Evolution

Neuromorphic technology represents one of the most exciting frontiers in computer science and artificial intelligence (AI). Inspired by the structure and function of the human brain, neuromorphic computing attempts to replicate how biological neural networks process information.
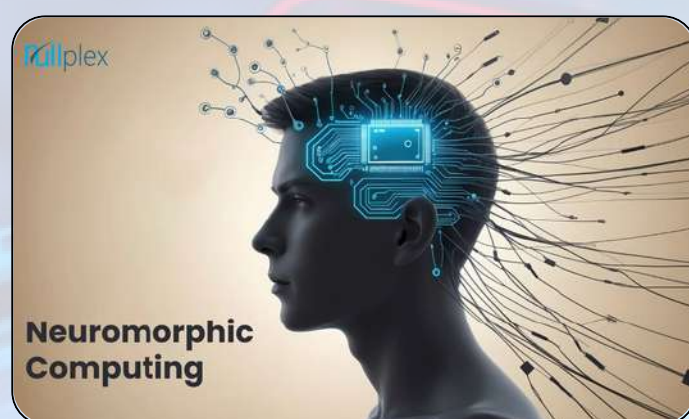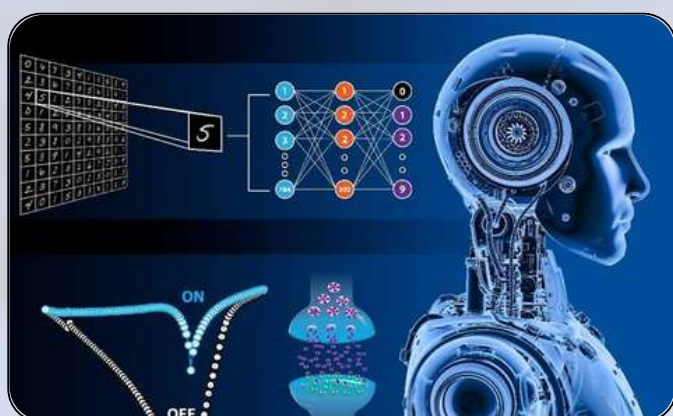
Neuromorphic Computing is an innovative field that emulates the structure and functioning of the human brain to create more energy-efficient, adaptive, and intelligent computational systems. It uses spiking neural networks (SNNs), which mimic the way biological neurons communicate by transmitting information in the form of discrete spikes. Unlike traditional computing, which processes data continuously, neuromorphic systems react to events in real-time, making them highly energy-efficient. These systems can learn and adapt through processes similar to synaptic plasticity, enabling real-time decision-making in applications like robotics, AI, machine learning, and brain-computer interfaces. Neuromorphic computing holds significant potential for solving complex problems while reducing power consumption.

1. Artificial Neurons and Synapses: Just as biological neurons fire electrical impulses to communicate, artificial neurons in neuromorphic systems use electronic circuits to simulate this behavior.

2. Spiking Neural Networks (SNNs): Unlike traditional neural networks that rely on continuous values, SNNs transmit information as discrete spikes.

3. Hardware and Software Integration: Neuromorphic technology integrates both hardware (e.g., neuromorphic chips) and software (spiking neural network algorithms) to achieve brain-like computation.

FACULTY SPEAK

Ms. P.R.Koravi
Lecturer

Blue Eyes :Era Of Computer Vision

"Blue Eyes" is a groundbreaking research project that stands at the forefront of advancements in computer vision and human-computer interaction. This innovative initiative aims to develop systems that can accurately perceive and interpret human emotions, behaviors, and physiological states through visual and sensory inputs.

Blue Eyes Technology is a computer vision technology that allows people to interact with computers and other devices using their eyes. It uses cameras, image processing algorithms, and software to recognize and track eye movements.It is invented by IBM at its Almaden Research Center (ARC) in San Jose, California since 1997.

Blue Eyes Technology aims to make computers understand human passions and gestures. It can sense a person's physical mindset and conduct using detectors.

Blue eyes technology identifies mortal feelings using image processing ways by rooting eye portion from the captured image and compares it with the stored images in the database. This high- end technology facilitates the computers to talk, hear and feel our presence with colorful tools of artificial intelligence like face recognition, point, and videotape call development This technology is used to simplify life by furnishing stoner-friendly installations. It also helps in reducing the gap between the computer and mortal. conduct small and large scale of natural and medical images, is done with optic consonance tomography (OCT). OCT uses infrared light to measure the consistency of towel. It generates three-dimensional images that can be used for diagnostics.The potential of Blue Eyes Technology extends across diverse domains, from healthcare and assistive technologies to entertainment and security systems. By narrowing the gap between human intent and machine response, it promises a future where human-computer interactions are more natural, efficient, and emotionally aware.

STUDENT SPEAK

Cloud Computing

Mr.Pruthesh Upadhye
TYCO

Cloud computing delivers on-demand IT resources, such as servers, storage, databases, networking, software, and analytics, through the internet. Instead of owning physical data centers or servers, users can rent computing power and storage on a pay-as-you-go basis.

Characteristics of Cloud Computing :

1. On-Demand Self-Service: Users can provision computing capabilities as needed without requiring human interaction with service providers.
2. Broad Network Access: Resources are accessible over the internet using various devices like laptops, smartphones, or tablets.
3. Resource Pooling: Multiple users share computing resources, dynamically allocated based on demand.
4. Scalability: Users can scale resources up or down depending on their needs.
5. Measured Service: Pay-per-use pricing based on resource consumption.

Cloud Service Models (SPI Model) :

1. SaaS (Software as a Service):
• Access software applications over the internet. Examples: Gmail, Microsoft Office 365, Dropbox.
2. PaaS (Platform as a Service):
• Provides platforms for application development without managing underlying infrastructure.
• Examples: Google App Engine, Heroku, AWS Elastic Beanstalk.
3. IaaS (Infrastructure as a Service):
• Offers virtualized computing resources like servers, storage, and networking.
• Examples: AWS EC2, Microsoft Azure VMs, Google Compute Engine.

STUDENT SPEAK

Cryptography and network security

**Ms. Vaishnavi Gurav
TYCO**

Cryptography is a fundamental field in information security, designed to protect sensitive data from unauthorized access, ensure the integrity of communication, and verify the authenticity of users and systems. The core idea of cryptography is to convert readable data into an unreadable format, known as ciphertext, through encryption, which can then be returned to its original form, or plaintext, via decryption.Cryptographic systems rely on keys, which are used in both the encryption and decryption processes. These keys can either be symmetric, where the same key is used for both processes, or asymmetric, where a pair of related keys is used— one public and one private.
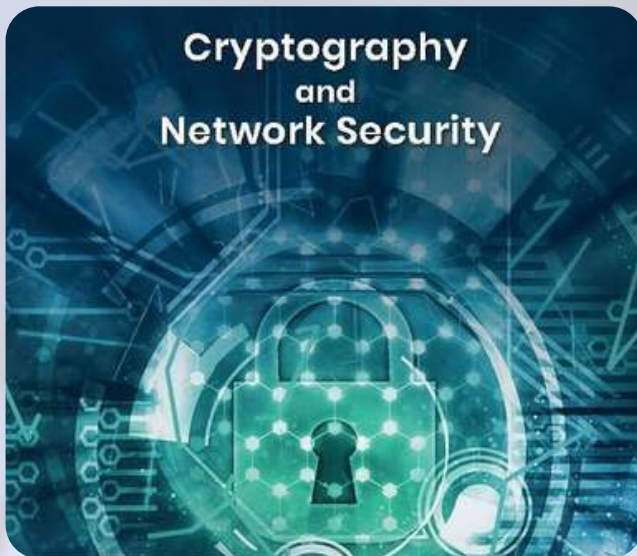
Uses of cryptography and network security:

1. Securing Communication Channels:

- Encryption is used to protect the confidentiality of data during transmission, such as in email communication, VoIP calls, and instant messaging.
- Protocols like TLS/SSL are used in securing web traffic (HTTPS), ensuring that the data exchanged between a user's browser and a website is encrypted and safe from eavesdropping or tampering.

2. Secure Online Transactions:

- Cryptography secures online payment systems (e.g., credit card transactions, online banking) by encrypting transaction data and ensuring that it is protected against interception and fraud.
- Digital certificates ensure that websites involved in online transactions are genuine, helping to prevent phishing and man-in-the-middle attacks.

3. Securing Wireless Networks:

- Wi-Fi encryption protocols such as WPA2 and WPA3 protect wireless networks from unauthorized access, ensuring that the data transmitted over wireless connections remains private.
- VPNs (Virtual Private Networks) use encryption to secure internet connections and create a private network over the public internet, ensuring that sensitive information is safe from interception.

4. Secure Software Development:

- Code signing is used to verify the authenticity of software applications and ensure they have not been tampered with by attackers.
- Cryptographic hash functions are used in version control and integrity checks during software development to prevent the introduction of malicious code.

Industry Speak

Dear Readers,

In today's fast-paced digital world, cybersecurity is not just a technical challenge; it's a societal need. With an increasing reliance on technology, every generation faces unique cybersecurity challenges, but none more so than today's hyper-connected population. This newsletter highlights the critical aspects of cybersecurity that are shaping the future and the measures we must take to stay secure. Cyberattacks have grown in sophistication, with ransomware-as-a-service (RaaS) and AI-driven malware becoming prevalent. Understanding these threats is critical to protecting personal and organizational data. Internet of Things (IoT): IoT devices are a double-edged sword, offering convenience but also increasing attack surfaces. While they help identify threats, they can also be exploited to launch more sophisticated attacks. Striking a balance between innovation and user privacy remains a pressing issue. The importance of compliance with laws like GDPR and CCPA is more significant than ever. The shift to remote work has opened up new vulnerabilities, requiring robust endpoint security, secure VPNs, and zero-trust architectures. There's a growing need for cybersecurity professionals. Upskilling the current workforce and inspiring the next generation of ethical hackers is crucial. Support research initiatives focused on developing new cyber security technologies and techniques for AI systems.The need for robust cybersecurity measures has never been greater. By staying informed, proactive, and resilient, we can ensure a safer digital future for everyone.

Dear Readers,

As we continue to advance in the field of Artificial Intelligence (AI), the need for robust cyber security measures has become more pressing than ever.

The increasing reliance on AI and machine learning (ML) has opened up new vulnerabilities that threat actors are eager to exploit. Data Poisoning in AI systems can be compromised by feeding them manipulated data, leading to biased outcomes and decisions. Model Inversion Attacks in Hackers can reverse-engineer AI models to gain access to sensitive data and intellectual property. Adversarial Attacks in Malicious actors can craft inputs that cause AI systems to misbehave or make incorrect decisions. 1. Financial Losses in Cyber attacks on AI systems can result in significant financial losses, damage to reputation, and legal liabilities. Compromised Safety in industries like healthcare, transportation, and energy, compromised AI systems can have catastrophic consequences for human safety. Erosion of Trust in as AI becomes more pervasive, cyber attacks can erode public trust in these technologies, hindering adoption and innovation.Implement Robust Security Measures in Develop and implement comprehensive security protocols for AI systems, including data encryption, access controls, and anomaly detection. Conduct Regular Security Audits in Perform regular security audits and penetration testing to identify vulnerabilities and address them before they can be exploited. Foster a Culture of Security in Educate developers, users, and stakeholders about the importance of cyber security in AI and encourage a culture of security awareness.

Mr. Mayuresh Patil

Current company : LTIMindtree

Designation: Specialist Software Engineering

Total years of experience: 10+ years

Mr. Ninad Kukdolkar

Current company name : infosys

Designation: Senior Consultant

Total years of experience: 8+ years

Faculty Achivement

Faculty Attended Training

Appreciation of Dr. Y.R. Guarav from Hon. Vijaysinh Mane Saheb, Hon. Manisha Mane Vahinisaheb, Dr. Vasant Bhosale during Faculty Appreciation Award 2024 Organized by Ashokarav Mane Group for completion of his PHD in Computer Science and Engineering . His work in Product review classification and sentiment analysis using NLP and Advance deep learning approach has given a new direction in this field.

Ms. S. R. Chougale has successfully attended five days faculty development program on "OUTCOME BASED EDUCATION."

Mr. A. B. Deshmukh has successfully attended five days faculty development program on "Power BI."

Appreciation of Dr. S.A. Lakade from Hon. Vijaysinh Mane Saheb, Hon. Manisha Mane Vahinisaheb, Dr. Vasant Bhosale during Faculty Appreciation Award 2024 Organized by Ashokarav Mane Group for completion of his PHD in Computer Science and Engineering . His work in Encrypted cloud data deplection technique for secure data storage optimization over cloud has given a new ideas and new solution in security purpose and data optimization in cloud.

Ms. P. P. Maske has successfully attended three days faculty development program on "Professional Ethics and Effective Teaching Methodology."

STUDENT ACHIVEMENTS

Our Glorious Topper's in winter 2024 exam of MSBTE

Third Year

DANGE DIPTESH DILIP
94.23%

KULKARNI ATHARV DIGAMBAR
89.76%

PATIL AKASH VIDYADHAR
89.06%

Second Year

GURAV VAISHNAVI PRAKASH
90.00%

UPADHYE PRUTHESH NEMINATH
89.86%

PATIL SHRAVANI VILAS
89.33%

First Year

PATIL HARSHDA ARUN
90.47%

PATIL ARPITA DILIP
90.35%

PATIL ADITI SANDIP
90.35%

Success Story

Mr. Sanket Sarjerao Patil our alumni from 2019-20 pass out batch currently working in " WIPRO" company as a junior S/W Engineer . The Computer Science program has taught me fundamental approach, evaluate and solve problems. The interaction with the professors and their sincere desire for my success was truly invaluable. As a direct result of their encouragement, I am working at WIPRO. there, I am able to apply and build upon what I had been taught. With both classroom and related work experience, I am able to secure a permanent position in a company. Overall, I feel my time at AMP was a worthwhile investment for both personal and professional development."

Sanket Sarjerao Patil
TYCO
Alumni 2019 - 20

Theme for next issue :
Data Science new
challenge's in IT industry

HAPPY

NEW YEAR

About Theme : Cyber Security - The Need of This Generation

Cybersecurity has become an indispensable necessity in today's digitally interconnected world. Our reliance on technology for everything from banking and shopping to healthcare and entertainment has created a significant vulnerability to cyberattacks. The sophistication of these threats, including ransomware, phishing, and data breaches, continues to evolve, demanding robust defenses. Furthermore, the protection of critical infrastructure like power grids and transportation systems is paramount to prevent societal disruption. Safeguarding personal information from identity theft and financial fraud is also crucial. Ultimately, cybersecurity is no longer just a technical concern; it's a societal imperative for individuals, businesses, and governments alike to prioritize and implement strong security measures to thrive in this increasingly digital age. Cybersecurity has become a paramount concern for individuals, businesses, and governments alike in today's hyper-connected world. Our reliance on technology permeates every aspect of modern life, from the mundane (online shopping and banking) to the critical (healthcare, transportation, and national security). This pervasive digital dependence creates a vast and ever-expanding attack surface for cyber criminals. The sophistication of cyber threats is constantly evolving, with malicious actors employing increasingly sophisticated techniques such as Ransomware in this type of malware encrypts a victim's data and demands a ransom for its release, crippling businesses and disrupting critical services. Phishing in These deceptive tactics, often delivered through emails or social media, aim to trick individuals into revealing sensitive information like passwords and financial details. Data Breaches in Large-scale data breaches can expose sensitive personal information, leading to identity theft, financial fraud, and severe reputational damage for organizations.

In today's hyper-connected world, cybersecurity is no longer an option, but a fundamental necessity. Our reliance on technology permeates every facet of modern life, from the convenience of online shopping and banking to the critical infrastructure that sustains our society. This digital dependence, however, comes at a price: increased vulnerability to cyber threats. The threat landscape is constantly evolving, with cybercriminals employing increasingly sophisticated tactics. Ransomware attacks, phishing scams, and data breaches are becoming more frequent and devastating, targeting individuals, businesses, and even critical infrastructure like power grids and healthcare systems.