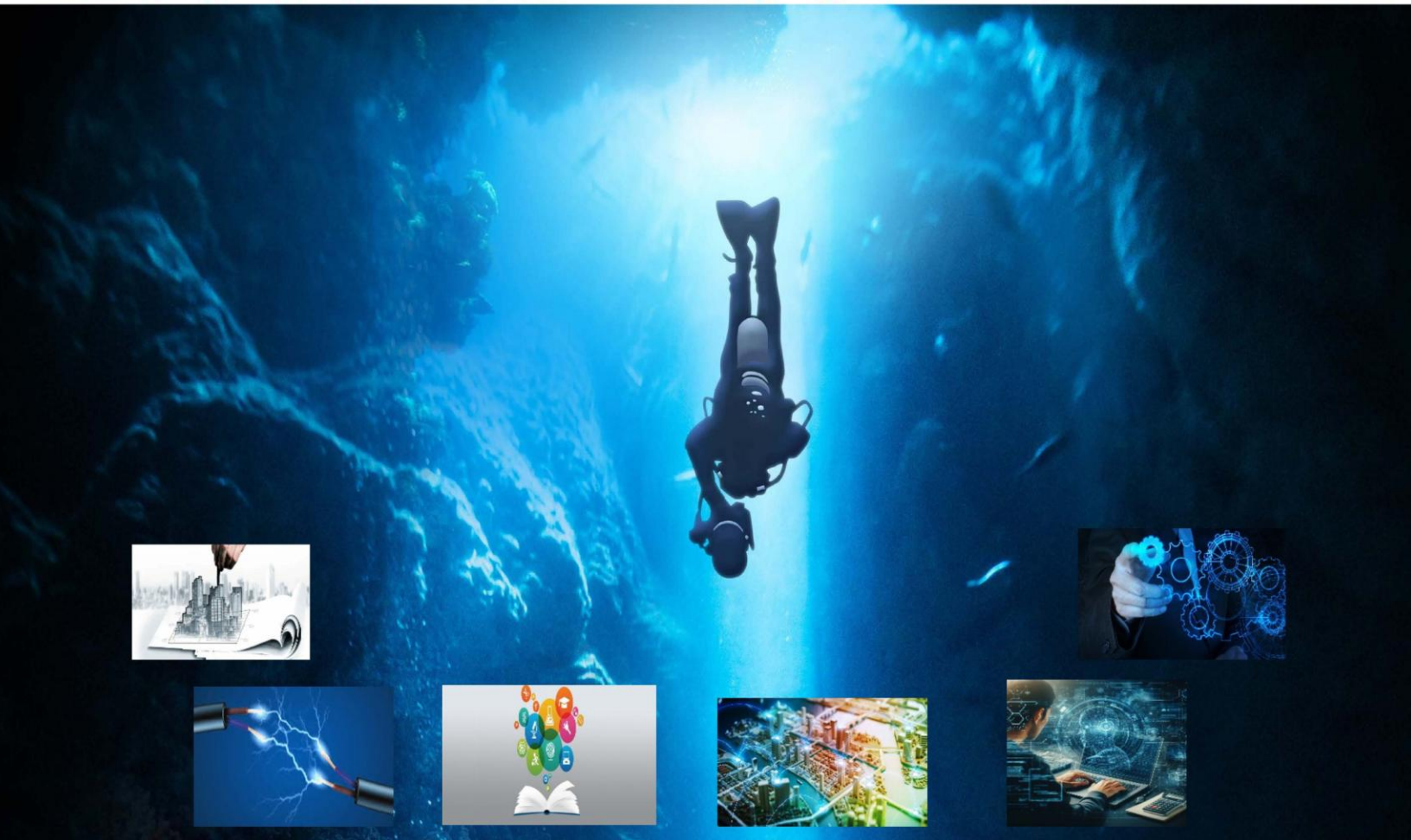
DIVING DEEP

JUNE 2025 | VOLUME I, ISSUE II

SPECTRUM



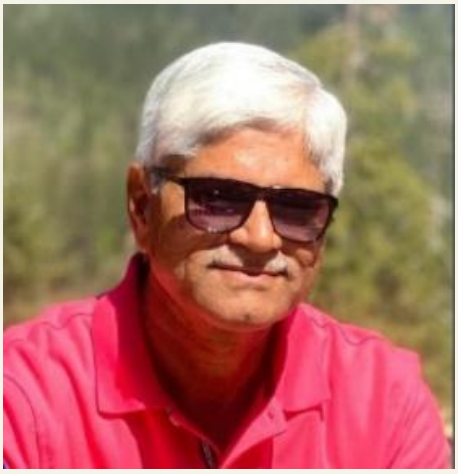
B.A. COLLEGE OF ENGINEERING & TECHNOLOGY JAMSHEDPUR, JHARKHAND

RAJENDRA VIDYALAYA (RV) GROUP OF INSTITUTIONS

APPROVED BY AICTE & AFFILIATED TO JHARKHAND UNIVERSITY OF TECHNOLOGY

Inside This Issue

CHAIRMAN 'S MESSAGE



I am very pleased to know that B.A. College of Engineering and Technology (BACET), Jamshedpur, is releasing the second issue of its technical magazine, "**SPECTRUM**."

It gives me immense pleasure to note that the response to this edition of our college magazine has been overwhelming. The wide spectrum of articles across different sections fills me with pride, as it reflects the creative potential and original thinking possessed by our students and faculty members. Each article is engaging, interesting, and thought-provoking. I applaud the contributors for their insightful thoughts and the diverse perspectives they have brought to their articles.

As we delve into the pages of this technical magazine, let us remember that engineering is not just about solving problems; it is about envisioning a better future. This magazine stands as a testament to our collective ingenuity, a platform for sharing knowledge, and a springboard for innovation. Let us continue to push boundaries, embrace challenges, and shape a world where technology serves humanity.

Congratulations to the team responsible for this demanding task, executed most effectively. I am hopeful that this piece of technical work will not only foster a love for reading among students but also cultivate a sense of belonging to our institution.

-Dr Shio Kumar Singh
Chairman, Board of Governors
BA College Of Engineering and Technology (BACET), Jamshedpur

FROM THE PRINCIPAL'S DESK

Dear Students, Faculty, and Staff,

It is with great pride and enthusiasm that I share my message for this year's edition of our college magazine. As we reflect on the journey we've travelled together, it's impossible not to be inspired by the growth, achievements, and resilience displayed by our students and faculty alike. This magazine serves as a testament to the creativity, hard work, and innovation that define our institution.

Engineering, as a discipline, is constantly evolving. Our college has always been a place where curiosity meets opportunity, where students are encouraged to think critically, work collaboratively, and innovate fearlessly. This year, we have witnessed exceptional academic performances, outstanding projects, and active participation from our students in various technical events and competitions. You are not just learning theories—you are preparing to become the leaders and innovators of tomorrow.

As we celebrate your achievements and look toward the future, I urge each of you to continue nurturing your passion for learning and discovery. Engineering is not just about solving technical problems; it's about creating solutions that impact society and shape a better world for future generations. Always remember that each challenge you face is an opportunity to learn, grow, and contribute to a greater cause.
Wishing you all the very best in your endeavors.

Warm regards,

-Dr. S.K. Roy
Principal, B.A. College of Engineering and Technology

EDITORIAL BOARD

It is with great enthusiasm that we present this edition of our college's technical magazine, SPECTRUM—a vibrant platform showcasing the innovation, knowledge, and creativity of our students and faculty. This magazine isn't just a collection of articles; it's a reflection of the talent, curiosity, and hard work that define our institution. From emerging technologies to real-world applications, each contribution highlights our commitment to excellence and exploration. We hope this issue sparks new ideas, inspires a love for learning, and encourages everyone to keep pushing boundaries. Happy reading!

-Manorama Singh
Chief Editor & Assistant Professor (Mechanical Engineering)

Welcome to this edition of our college's technical magazine. In today's fast-paced technological world, innovation and creativity are driving change at unprecedented speeds. As part of the editorial team, we believe in harnessing the power of new ideas while upholding professional ethics and integrity. By combining advanced technology with ethical business practices, we can shape a future that not only pushes boundaries but also contributes positively to society's growth and progress.

-Jay Prakash Kumar
Editor & Assistant Professor (Mechanical Engineering)

Dear Readers,

We are delighted to present this edition of our college magazine, a testament to the innovation, creativity, and academic excellence of our B.Tech students. This platform celebrates our journey of learning, research, and technological advancement. We hope it informs, inspires, and ignites curiosity.

-Suraj Kumar
Editor & Assistant Professor, HoD (Civil Engineering)

Dear Readers,

Welcome to second edition of Spectrum. This issue celebrates creativity, knowledge, and the vibrant spirit of our student as well as faculty community. From thought-provoking articles to artistic expressions, we bring you a diverse collection of voices that inspire and engage. Our magazine is a reflection of your passion, talent, and dedication. A heartfelt thanks to our contributors and editorial team for their hard work. We hope this edition sparks new ideas and fuels your enthusiasm. Keep reading, creating and making a difference.

-Himadri Bhusan Mahapatra
Editor & Asst. Professor, HoD (CSE Department)

Dear Readers,

As we embark on another exciting chapter of our college journey, we are reminded of how swiftly time passes and how much we continue to grow. College life, with all its highs and lows, is an incredible journey of self-discovery, learning, and transformation. This issue of the magazine captures the essence of these experiences — of the curiosity, the challenges, and the triumphs that come with being a part of this vibrant community. Let's continue to support each other in our individual and collective growth because these experiences we undergo will shape the person we are and will become. Here's to the new beginnings, challenges, and triumphs. Let's make the most of every moment.

-Dr. Ankita Sahu
Editor & Assistant Professor English (BSH Department)

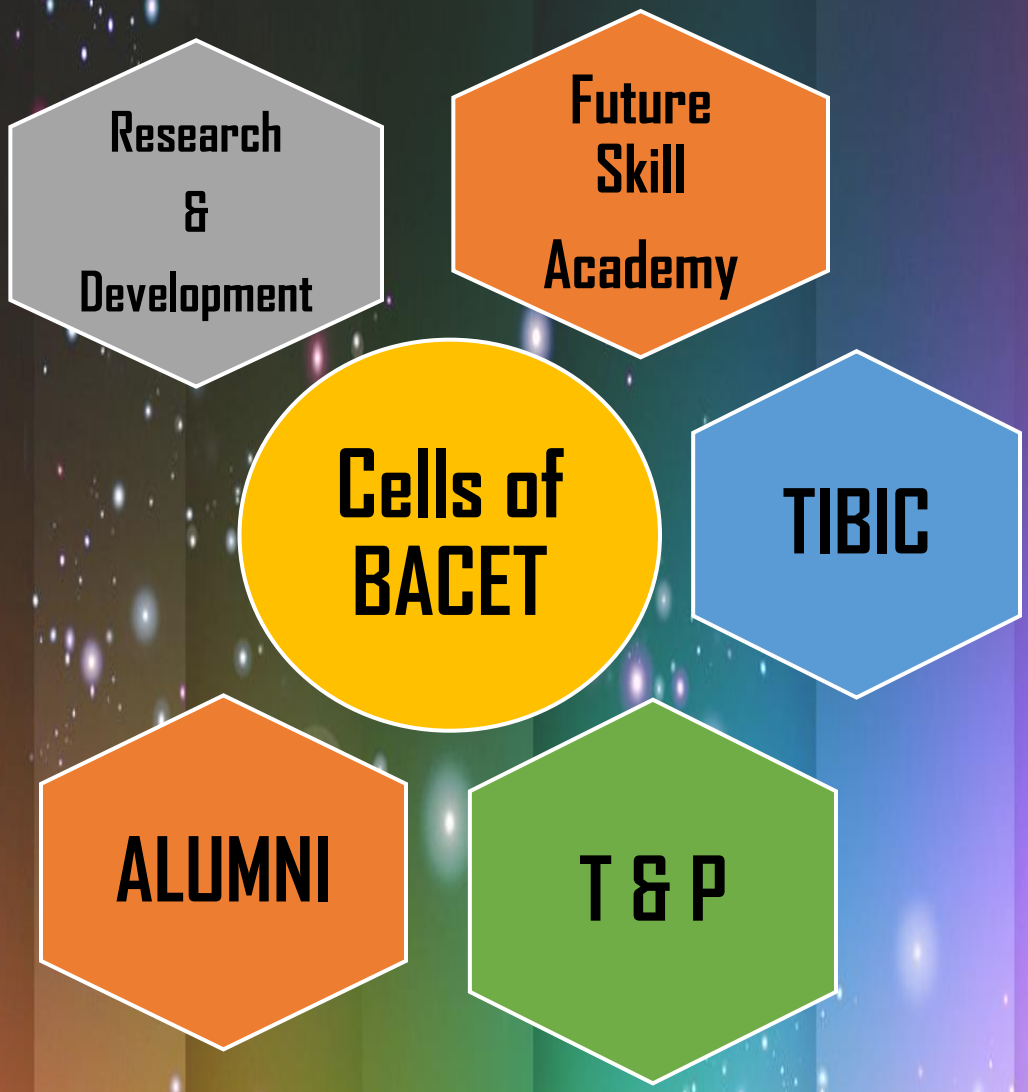
VISION & MISSION

MISSION

1.To empower learners by providing best technical education with leadership and professional skills.
2.To provide "Education for Living and Livelihood" by focusing on the inculcation of the human moral values.
3.Enable students for deep learning, rational thinking and flair for entrepreneurship through industry institute interaction.

VISION:

Our Vision is to be a premier centre of Technical & management Studies through excellence in Engineering Education and research, thereby producing global leaders to meet current and future challenges of industry & society.


Research
&
Development
Future
Skill
Academy
Cells of
BACET
TIBIC
ALUMNI
T & P

Tribological behavior of hard nanocomposite thin film

In several industries, the stainless steel 304 (SS 304) made equipment and components are mostly exploited owing to its appreciable mechanical properties. But, the SS 304 made materials are less used in the areas where these are prone to frequent wear, erosion and abrasion owing to its low tribological properties. In this context, an extensive exploratory research work to enhance the desired wear resistant property of SS 304. The tribological property of nanocomposite material (Fig. 1) depends upon applied load, coating thickness, temperature, rotating speed, counter material and other variables. Such nanocomposite protective coatings are potential materials used in several applications or appliances undergoing wear or abrasion, for instances, turbine blades, turbine bearings, diesel engines, piston rings, aircraft components and so on.

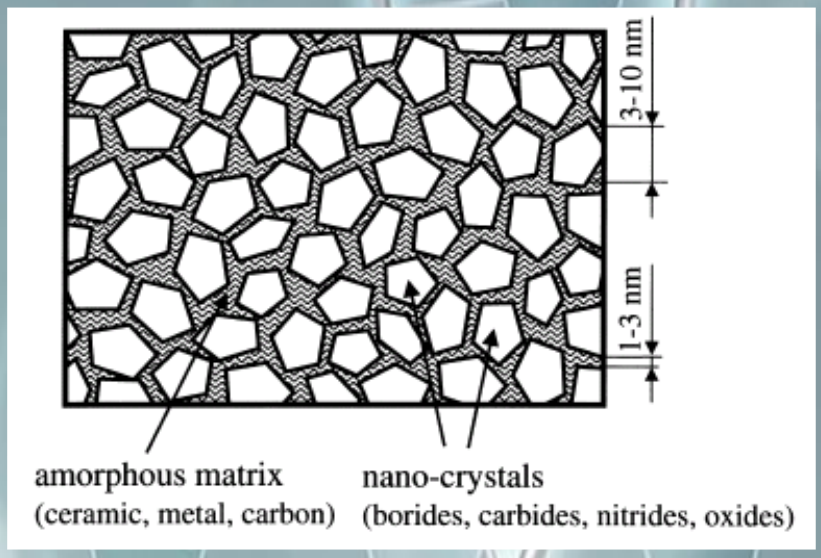


Fig.1. Nanocomposite materials

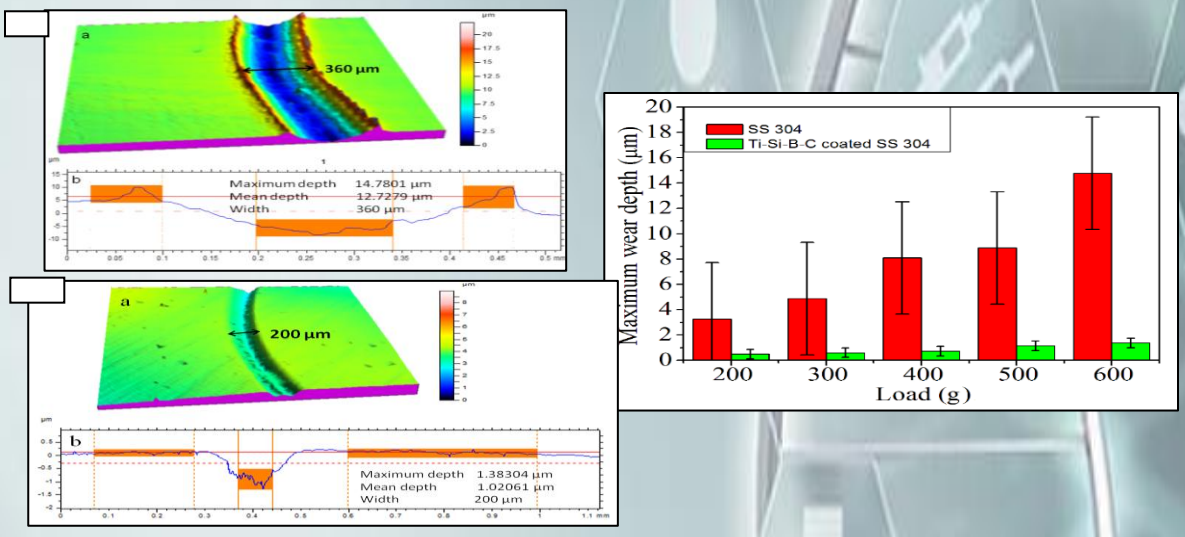


Fig. 2 3D topography and 2D cross-section profile of worn scar and Wear depth (with error bars) on the surfaces of uncoated and coated substrate at different load.

In view of this, The R& D Cell of BACET has been started to work on the nanocomposite thin film on the steel surface to enhance the tribological properties.
Few of the achievements have been discussed below as:

- The multicomponent titanium-silicon-boron-carbon films were deposited on SS 304 using physical vapour deposition technique.
- The 10 µm thickness films on SS 304 shown excellent tribological performance (Fig. 2).
- The average hardness and modulus values of the worn region were investigated, which are ten times more than steel surface.

The research publication (During 2023-24):

1. Magnetron sputtered films prepared from sintered Ti-based target and evaluation of tribological properties under ball on disc condition with varying thickness and load, **Parikshit Mahato**, Manilal Murmu, Priyabrata Banerjee*, Suman Kumari Mishra*, Journal of Adhesion Science and Technology, 37(8) (2023) 1345-1372. https://doi.org/10.1080/01694243.2022.2079861 (I.F: **2.431)** (Q2)

2. Energy-efficient synthesis along with in-depth insight into anticorrosion behavior of double-armed phenylenebis (azanylylidene) bis (methanylylidene) derivatives: A symphony of green defense unveiling the 4E synergy, Sanjukta Zamindar, Sukdeb Mandal, Manilal Murmu, **Parikshit Mahato**, Priyabrata Banerjee*, Journal of Industrial and Engineering Chemistry, Accepted 30 July 2024, DOI: 10.1016/j.jiec.2024.07.058 (I.F: 5.9) (Q1)

-Dr. Parikshit Mahato,
Assistant Professor, ME
Member, R&D Cell

Future Skill Academy

Centre for Future Skills

"Skills Every Student Should Develop for Future Success"

In alignment with our vision to bridge the gap between academic knowledge and industry demands, the BA College of Engineering & Technology established the Centre for Future Skills. This center will serve as a hub for students from all disciplines to acquire cutting-edge skills, stay up-to-date with technological advancements, and prepare for dynamic career paths through professional certifications and structured training programs.

Importance of Skill Development in Education

Upskilling and Reskilling: Equip students with in-demand skills across emerging technologies like AI, cloud computing, data science, cybersecurity, blockchain, and more. Students will also be trained in essential digital tools such as data analytics, digital marketing, financial technologies (FinTech), and supply chain management software.

Professional Certifications: Facilitate students' attainment of globally recognized certifications in emerging technologies (e.g., AWS, Google Cloud, Microsoft Azure) as well as management-focused certifications such as Project Management Professional (PMP), Certified Financial Planner (CFP), Six Sigma, and Digital Marketing certifications.

Industry-Aligned Learning: Offer courses designed in collaboration with industry partners to meet the current market requirements in both technical and management fields.

Competitions and Hackathons: Foster innovation and problem-solving through regular tech challenges, case competitions, business plan contests, and skill-based events that combine technology with entrepreneurial thinking.

Workshops and Bootcamps: Conduct intensive hands-on training sessions, boot camps, and upskilling events focused on real-world applications, including business simulations and innovation workshops for students.

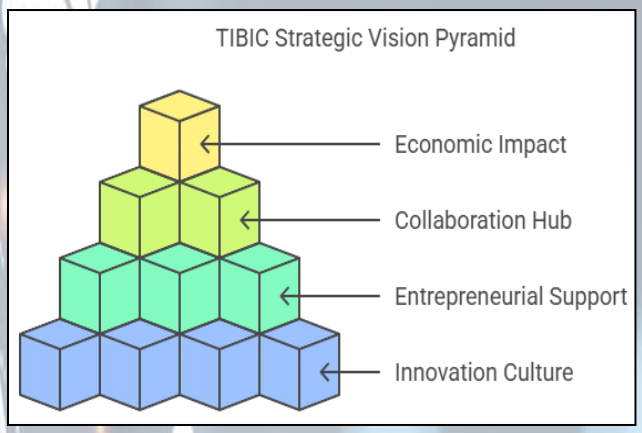
Career Guidance and Mentorship: Provide students with career counselling, mentorship from industry experts, and networking opportunities to help them thrive in the future workforce. Students will receive training in leadership development and negotiation skills.

Through this initiative, we aim to create an agile and adaptive learning environment that prepares students, whether in technology or management, to be future-ready, addressing the ever-evolving demands of the global job market. The Centre for Future Skills will be a platform for continuous learning, innovation, and career success.

-Himadri Bhusan Mahapatra
Assistant Professor, CSE,
Coordinator, Future Skill

Technical Innovation & Business Incubation (TIBIC)

Fostering Innovation:



The Technology Innovation and Business Incubation Center (TIBIC) at B.A. College of Engineering and Technology, Jamshedpur

In today's rapidly evolving technological landscape, innovation is no longer a luxury but a necessity for survival and growth. Recognizing this, B.A. College of Engineering and Technology, Jamshedpur, has established a state-of-the-art Technology Innovation and Business Incubation Center (TIBIC) to nurture a culture of innovation and entrepreneurship among its students, faculty, and the wider community. This center serves as a dynamic hub, bridging the gap between groundbreaking ideas and successful ventures.

Vision

To be a leading hub for technological innovation and entrepreneurship, empowering students and faculty to create impactful solutions that address real-world challenges.

Mission

To provide a supportive ecosystem that nurtures creativity, fosters collaboration, and equips aspiring entrepreneurs with the necessary skills, resources, and mentorship to succeed in their ventures.

Objectives

- Identifying ideas, Proof of Concepts (POC), prototypes and translating them into product development and MVP stages through TRL activities.
- Conducting Ideathons, Hackathons and Boot camps to engage and develop interest among all students, faculties and Innovators.
- To create infrastructure for rapid prototyping, product development and MVP stage of Innovations.
- To inculcate generation of IPR’s among the faculty members, students and Innovators.
- Effective implementation of Pre-Incubation Program.

B A College of Engineering and Technology's TIBIC is committed to nurturing the next generation of innovators and entrepreneurs. By providing a comprehensive ecosystem of support, resources, and mentorship, the center empowers individuals to transform their ideas into successful businesses. It stands as a testament to the college's commitment to fostering innovation and contributing to the economic and social development of the region. As technology continues to

advance at an unprecedented pace, the TIBIC will play an increasingly crucial role in driving innovation and shaping the future. The center is not just building businesses; it's building a future fueled by innovation and entrepreneurship.

-Mr. Ranjan Ganguli, Assistant Professor, CSE
Coordinator, TIBIC

Training & Placement (T&P) Cell

Training and placement cell endeavor or aim is to equip students with necessary skills required for their employability in the various industries and other organizations. T&P Cell acts as an interface between the institute and the industries/corporate world and performs entire gamut of activities such as Industry-Academia interaction, Guest lectures, corporate training, Seminars and workshops This is done on time-to-time basis for strengthening the corporate relations and ultimately help students getting placed in good organizations.

The Training and the placement cell organize personality development which includes are series of development activities like Self Discovery, Self Development, Self Master, Self Actualization. In Self-discovery the Engineering students is counseled or explained to identify its Core strength area. As the students identifies its core strength area whether it is IT Side or Core Technical side or Research, accordingly his future is planned in this organization. Also, in the personality development programs the students are trained to present him/her in an impressive manner and with positively attitude. Career guidance and counseling programs for the students are done on regular basis to gear them up to take on the stiff competition in the corporate world.

Apart from this, knowledge enrichment of the students are done by the various E-Learning courses. Also, the students are trained to present on regular basis on the learning which he has done in his summer training or during any other technical development or improvement program.

Group discussions on the current as well as on the technical topics are done for the students to make them technically smart and knowledgeable about the current affairs also. Mock interviews & Aptitude tests are done on time-to-time basis to improve his aptitude capabilities.

The Cell is well equipped with ample infrastructure in terms of Consultancy Hall, Conference room, for Pre Placement Talk, Presentations etc and Computer labs for online tests also. Many reputed organizations including MNCs come to the College for campus recruitment. It works through a close knot organization and has a structure which conveys information to the students at the fastest possible rate.

Placements

It encourages visits to the industries by the college students. In addition to the afore-mentioned activities, the cell arranges expert lectures of Corporate Managers in both Technical and HRD streams for the students and faculty of the Institute. The cell has consistently put its effort to train and place the students to achieve their professional goals.

With all these efforts we have been successful to place our candidates in various MNC & good organizations.

Tata Steel Limited		Ranstad Manpower	
Ritika Tiwari, Mechanical Engg. (2019-23)	 Ankit Kumar Varnwal, ECE (2019-23)	 Ankit Mishra, Mechanical Engg. (2018-22)	 Shahbahz Ali Siddique, Mechnaical Engg. (2016-20)
Linde India Limited		**Nath Corp, Ranchi**	
 Rakhi Kumari, EEE (2017-21)	 Maruf Ahmed, Mechanical Engg. (2018-22)	 Anant Bera, CSE (2018-22)	 Nisha Kumari, CSE (2018-22)
BYJU'S, Bangalore		**JSPL Bhellari**	**BARC, Madras**
 Kalyani Sharma, CSE (2017-21)	 Neha Mishra, EEE (2016-20)	 Mahfuz Ansari, Mechanical Engg. (2016-20)	 Barun Dutta, Mechanical Engg. (2015-2019)

Wipro, Bangalore	Nath Corp, Ranchi	Infosys, Mysore
		
Amjad Hussain CSE (2018-22)		**Abhishek Kumar, CSE (2018-22)**

ALUMNI CELL

Our College Days at BACET: A Trip Down Memory Lane

We, **Enamul Haque** and **Tapan Kumbhakar**, are so happy to share the story of our time at **B.A. College of Engineering and Technology (BACET).** Those years were some of the best in our lives, filled with learning, fun, and experiences that shaped us into who we are today.

When we first joined BACET, we were excited but also a little nervous. The moment we stepped onto the campus, we were welcomed by friendly seniors and the lively atmosphere of the college. It didn't take long for us to feel like we belonged. We still remember how we nervously introduced ourselves in class but ended up making friends for life have lasted even to this day. Later, when we became seniors, we followed in their footsteps. We supported our juniors, shared our experiences, and tried to make their journey as smooth and enjoyable as ours. This culture of helping each other created a bond that connected everyone like a family.

The classrooms were where the real magic happened. Our professors didn't just teach us—they made learning interesting and fun. They encouraged us to ask questions and think deeply. Whether we were studying engineering theories or solving tough problems, they were always there to guide us.

The labs were another favourite part of college. We got to apply what we learned in class, whether it was electrical circuits or running experimentson motors and transformers. Of course, not everything worked perfectly the first time! But every failure taught us something new, and the joy of finally succeeding made it all worth it.

Outside the classroom, life was full of excitement. The cultural fests, sports events, and technical competitions were some of the most fun times we had. Everyone came together to celebrate, compete, and show their talents.The excitement of preparing for college events, decorating the campus, and cheering for our friends during competitions brought us all closer, like one big family. We still remember the energy and teamwork during these events, which made us feel proud to be a part of BACET.

The college canteen was our favourite hangout spot. Over Chai,Samosas and Maggie, we laughed, shared stories, and planned our futures. It was the perfect place to unwind after classes or recharge during busy days.

Group projects were another big part of our journey. Whether we were brainstorming ideas or putting together presentations, we learned so much about teamwork and problem-solving. Sometimes we stayed up late to finish our work, but the satisfaction of completing a project together was always worth it.

Even the challenges we faced, like preparing for exams or meeting deadlines, taught us valuable life lessons. We learned how to manage time, stay calm under pressure, and keep moving forward no matter what. These lessons still help us today in our personal and professional lives.

Looking back, BACET gave us much more than an education. It gave us memories, friendships, and skills that will stay with us forever. Even today, we feel proud to see how much BACET has grown and achieved over the years.

Today, as professionals in our respective fields, we carry with us the values and lessons imparted by BACET. This institution has given us more than just a degree; it has given us a strong foundation and a network of relationships that continue to open doors of opportunity.

To all the students currently at BACET, we want to say this: Make the most of your time here. Participate in events, learn as much as you can, and enjoy every moment. These years will fly by, but the memories you create will stay with you forever.

Thank you, BACET, for being such an important part of our lives. We will always be grateful for everything you've given us.

With love and best wishes
-Enamul Haque & Tapan Kumbhakar
Assistant Professor, EEE

ALUMNI SPEAKS:

Sudip Banerjee, B.Tech in Mechanical Engineering (2019-23)

I am working in Tata Motors Ltd Jamshedpur plant as a Senior Manager (Operation). B A College of Engineering given me the opportunity to upgrade my technical knowledge in mechanical Engineering domain as well as help to improve my professional career.

Durgesh Sahu, B.Tech in Mechanical Engineering (2019-23)

B.A College of Engineering & Technology is known for its excellent academic environment, well-equipped library, and dedicated faculty. The college offers a strong foundation in practical learning and innovation, helping students build solid technical skills for the future. Currently searching for a job in the mechanical engineering field to further develop skills and contribute to industry growth.

Contact Information: Email: durgeshsahu145@gmail.com, Phone: 7250374831

Rana Bhim Pratap Singh, Civil Engineering, (2019-23)

The four years at BA College of Engineering & Technology were a blend of learning, growth, and camaraderie. From mastering technical skills to forging lifelong friendships, it was a journey filled with vibrant fests, challenging projects, and inspiring mentors. These unforgettable moments shaped us into confident, resilient, and future-ready individuals.

RITIK RAJ, Mechanical Engineering (2014 – 18)

Alumini testimonials: - The transition from a 12th-grade student to a research scientist was undeniably challenging. However, BACET provided the crucial foundation and nurturing environment that propelled me towards my ultimate goal. I am particularly indebted to Prof. R.K. Bhol, the esteemed Head of the Mechanical Engineering Department during my time at BACET (#14-18). His unwavering belief in my abilities and his consistent encouragement were instrumental in shaping my academic and personal growth. Professor Bhol not only guided me in honing my technical skills

but also instilled in me the confidence and determination to excel. I am deeply grateful to the entire faculty of BACET for the invaluable opportunities they provided. Their dedication and mentorship have enabled me to pursue my passion for research. Following my bachelor's degree, I pursued a master's degree at the National Institute of Technology, Surathkal, Karnataka. Subsequently, I joined the National Taiwan University for my doctoral studies, where I also had the privilege of being a member of the Taiwan High Speed 3D Printing Research Centre. I recently completed my PhD and have assumed the role of Postdoctoral Research Scientist at the Multiscale Lab, National Taiwan University. I extend my sincerest best wishes to all current and future students of BACET.

BACET has been a wonderful budding ground for great talents. Equipped with the kind of experience I have gained in BACET, you are all set to enter & conquer the corporate world again. One of the things that I have learnt while in BACET is that our learning does not end when we pass out of your college; it is a continuous journey. As the classroom learning comes to an end, we start with learning through your experience while in the job. This requires us to be flexible, open to new ideas and most importantly, being honest to ourselves. You will encounter a lot of situations which you may not be experienced in your life. Your education through till now including the rich experience at BACET will provide you with a path towards managing each of these complex situations. For you to expect better things in life, you first have to focus on getting better as an individual - carrying an open mind willing to accept, learn and grow by constantly upgrading or adding to your skill sets/experiences. I've always believed, BACET with its massive campus, plethora of activities/facilities/talks/conferences and faculty members that are always happy to help and guide you - sky is the limit. In the two years, I spent at Amity, I grew exponentially as I learnt from all my brilliant teachers, seniors, fellow students and all the opportunities that challenged me and played a crucial role in shaping what I have become today.

I wish you all the very best for your corporate roles. Make every day count for yourself.

Mr. Md Tausif Alam, Batch 2105-2019,
Assistant Manager – Planning & Billing
State Water and Sanitation Mission, Lucknow

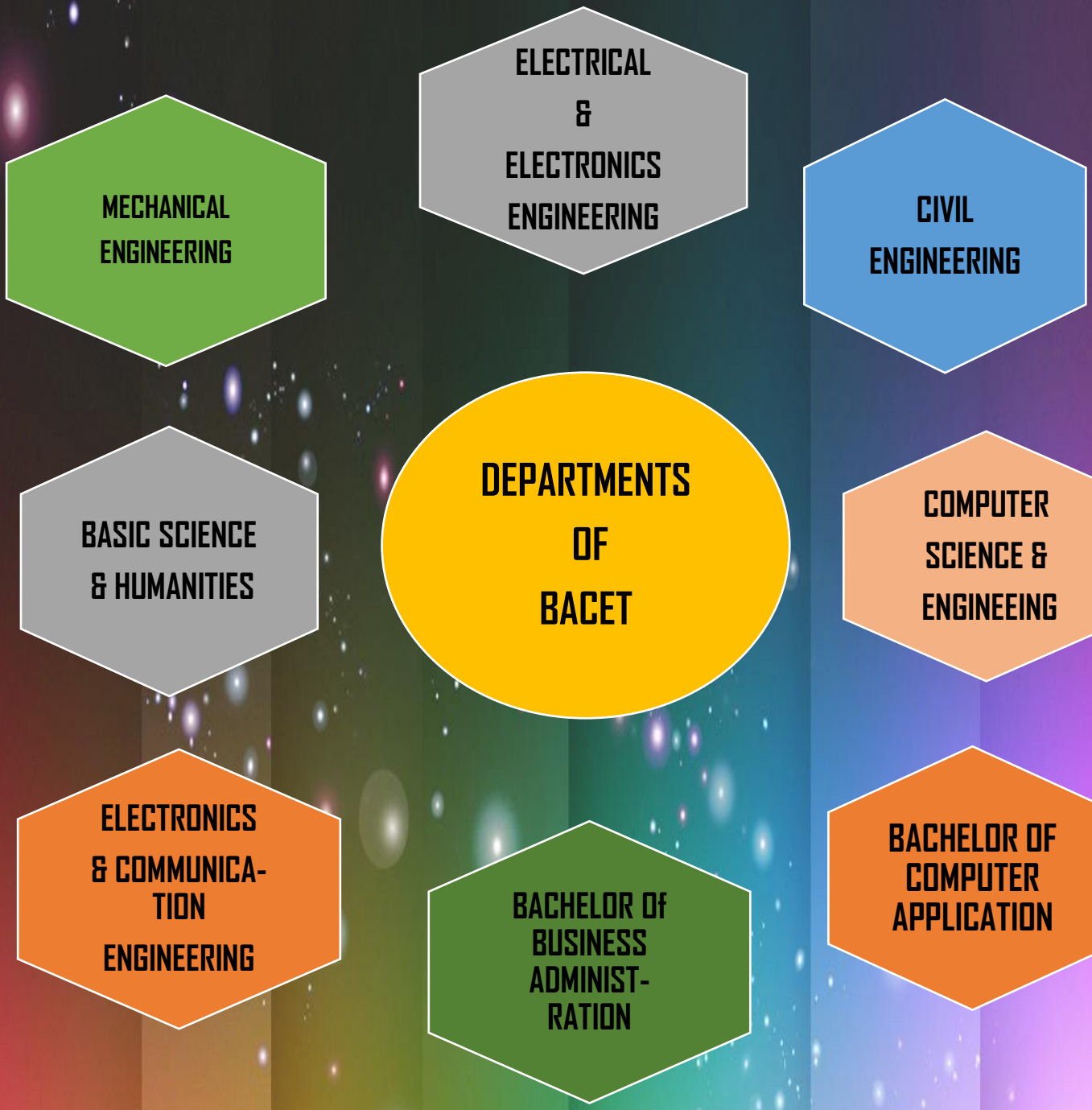
B A College Of Engineering & technology is the best college in Jamshedpur that gives you the state of art technical knowledge. The faculties here are very co-operative and help us to clear pictures of the engineering subjects.

My college life was a vibrant mix of learning and experiences. It was a time of growth, friendships, and self-discovery. From early-morning lectures to late-night study sessions, every moment shaped my future. The college campus buzzes with energy, filled with diverse activities and clubs. Amidst exams and deadlines, there's laughter and shared moments that create lasting memories. It's a journey of independence and responsibility, where we have learned to navigate challenges and celebrate successes. Through it all, college life molded us into the individuals we aspire to be, preparing us for the adventures that lie ahead.

Saif Khan, ME, Batch: 2009 – 13
Maintenance Manager - Linde India Ltd.

Md Mohid Musharraf, Electrical and Electronic Engineering (2015-2019)

Finding the right path to success at the right time is really very important and for that I had selected BACET. Four years at BACET have been an excellent memory to cherish for a lifetime. The time spent has been full of learning opportunities. The relationship between the students and faculty members is more like that of friends. The teaching faculty is fantastically knowledgeable. They have pushed me all the way to succeed in my career. I believe it was the best place for me to develop academically and culturally and at the same time it offered me opportunities to grow as a person. I have learned from amazing teachers and mentors. I have been influenced by the style which they carved in me – believing in yourself is the lynchpin of exceptional leadership. I loved the freedom that college gave me, which prepared me to face the real world and be an independent achiever. The college also has a wonderful track record of organizing various industrial visits, guest lectures, and conferences which gave the industry exposure and a practical sense to various things. The college provided an adequate ecosystem with the best-in-class facilities – hostel, library, laboratory, sports arena to name few and many extra-curricular and co-curricular activities"


ELECTRICAL & ELECTRONICS ENGINEERING
MECHANICAL ENGINEERING
CIVIL ENGINEERING
DEPARTMENTS OF BACET
BASIC SCIENCE & HUMANITIES
COMPUTER SCIENCE & ENGINEEING
ELECTRONICS & COMMUNICA-TION ENGINEERING
BACHELOR Of BUSINESS ADMINIST-RATION
BACHELOR OF COMPUTER APPLICATION

BACHELOR OF BUSINESS ADMINISTRATION (BBA): -

LIFE MANAGEMENT SKILLS FOR SUCCESS IN WORK AND LIFE

What is Life Management?

When we talk about life management we mean, literally, how you manage your life. Is there good balance between social, academic, and spiritual? Or do you feel like your priorities might be out of alignment? Sometimes it is needful to re-examine what you are doing to achieve balance. Life management refers to the ability to juggle different aspects of life, make sound decisions, and take positive actions that improve happiness and productivity. It's about exercising your mind to improve mental fitness, master emotions, and take charge of your life.

Don't confuse life management with time management. While both are closely related, life management goes beyond creating a to-do list and allocating time for events in your day. It transcends these aspects of time management to include everything from learning to set SMART objectives to building healthy habits that help hit these goals.

Why is life management important?

Life management allows you to be more productive, do more with less time and accomplish your goals. Good life management means you not only accomplish the basics – eating healthy, exercise, self-care – but also create the space to be an excellent person. It allows you to step out of "the hustle" and into a real enjoyment of life.

How can we better manage our life?

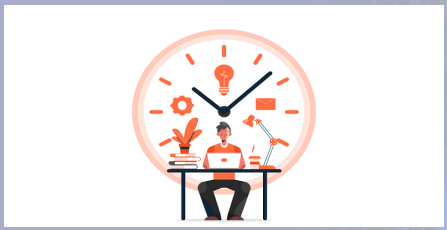
1. **Find purpose**

What do you want from your life? What is your ultimate outcome? Your true goal is something deeper and the life management skills you cultivate need to reflect that. What objective, when you think about it, brings you a sense of joy, fun and freedom? What does it mean to you? *That's* what you're working for.

2. **Your Communication Skills**

Effective communication is a valuable skill in life. If you know how to listen and respond to others, you'll be better placed to build strong relationships, solve conflicts, and achieve your goals. In the workplace context, effective communication helps teammates develop mutual understanding and strive towards a common goal. It improves teamwork and leads to increased productivity

3. **Improving Time Management**



Time management is crucial for both work and life because it allows you to prioritize tasks, maximize productivity, reduce stress, achieve goals more efficiently, and maintain a better work-life balance by effectively allocating your time to important activities, preventing procrastination, and minimizing distractions.

4. **Make Room for Important Tasks**

You must finish tasks that need to be done first, and focus on what's important, not urgent. This way you don't have to spend extra time worrying about accomplishing the priority and important task later. If you knock out the important tasks first, you will have an ample amount of time for the secondary tasks. In case a task comes up that needs your urgent attention, you can always move and postpone the less urgent one

5. **Build Healthy Relationships**

You need a support system — family and friends to give you love, support, and encouragement when things take a downturn. In other words, you have to learn how to build healthy relationships. Fostering better relationships with friends and potential clients begins by showing that you care about them. Be there to celebrate their achievements.

-Anubha Karmakar,
Lecturer cum HoD, BBA

BACHELOR OF COMPUTER APPLICATION (BCA): -

Bachelor of Computer Applications (BCA) is a dynamic undergraduate program that opens up diverse career opportunities in the IT and software industry. It blends core areas of computer science, programming, data management, and software development. Key subjects include Programming Languages, Database Management, Web Technologies, Data Structures, Cloud Computing, and Cybersecurity. The program emphasizes practical learning through real-time projects, internships, and hands-on software development experiences.

Vision

To be a centre of excellence in computer applications education, innovation, and research, nurturing skilled and ethical computing professionals equipped to address modern technological challenges.

Mission

- To offer a well-rounded curriculum integrating computer science fundamentals, software development, and emerging technologies.
- To build student expertise in programming, database systems, web development, cloud computing, and cybersecurity.
- To promote experiential learning through projects, internships, and real-world IT applications.

-Anima Mahato,
Assistant Professor, CSE

Basic Science & Humanities: -
Mathematics in Ancient India

S.N.	Detail of the Work/ Mathematician	Period /Location	Salient Contributions
1	**Vedic Texts**	3000BC or earlier	The earliest recorded mathematical knowledge, number system, Pythagorean type triplets; Decimal system of naming numbers, the concept of infinity.
2	**Sulba-sutras**- Baudhayana, Apasthamba, Katyayana and Manava Sulba-sutras	800-600 BC	Earliest text of geometry; Approximate value of the square root of 2, and π. Exact procedures for the construction and transformations of squares, rectangles, trapezia, etc.
3	**Aryabhata**-Aryabhatiyam	476-550 AD; Kusumapura, near Pataliputra, Bihar	Concise verses; Algorithm for square root, cube root, Place value system; Sine table; geometry; quadratic equations; Linear indeterminate equations; Sums of squares and cubes of numbers; Planetary astronomy; Plane and spherical trigonometry
4	**Varaha Mihira**- Brhat Samhita, Brhat-jataka, Panca-siddhantika	482-565 CE; Ujjain, Madhya Pradesh	Summary of five ancient siddhantas; Sine table, trigonometric identities; $sin^2 + cos^2$; Combinatorics; Magic squares.
5	Bhaskara I- Commentary on Aryabhatiya, Laghu-bhaskariyam and Maha-bhaskariyam.	600-800 CE; Vallabhi region, Saurashtra, Gujarat	Expanded Aryabhata's work on Integer solution for indeterminate equations; Approximate formula for the sine function, Planetary Astronomy.
6	**Brahmagupta**- Brahmasphuta siddhanta, Khandakhadyaka	598-668 AD; Bhillamala in Rajasthan	Rules of arithmetic operations with zero and negative numbers, Algebra (Bijaganita); linear and quadratic indeterminate equations; Pythagorean triplets, Formula for the diagonals and area of a cyclic quadrilateral; notion of arithmetic mean.
7	**Mahaviracarya**- Ganita-sara-sangraha	800-870 AD; Gulbarga, Karnataka	A comprehensive, exclusive textbook on mathematics covering arithmetic-geometry algebra, continuing the ancient Jain mathematics tradition; permutations and combinations; arithmetic and geometric series; the sum of squares and cubes of numbers in arithmetic progression.
8	**Shripati**- Ganita-tilaka, Siddhanta-sekhara, Dhikotidakarana, ect.	1019-1066 AD; Rohinikhanda, Maharashtra	Planetary Astronomy
9	**Bhaskaracarya (Bhaskara-II)**- Lilavati on arithmetic and geometry; Bijaganita on algebra; Siddhanta-siromani on astronomy; Vasanabhasya on Siddhanta-siromani.	1114-1185 AD; Hailed from Bijjadavida	Canonical textbooks used all over India, Detailed explanations including Upapatti (demonstration or proof); addition formula for sine function, Surds; permutations and combinations; Solution for indeterminate equations, Ideas of calculus, including mean value theorem, planetary astronomy; construction of several instruments.
10	**Kamalakara**- Siddhanta-tattva-viveka	1616-1700 AD; Varanasi, Uttara Pradesh	Addition and subtraction theorems for the sine and the cosine; Sines and cosines of double, triple, angles, etc.

- Ratan Kumar Sharma,
Hod Basic Sc. & Humanities

Prospects of Dye-Sensitized Solar Cells

Dye-Sensitized Solar Cells (DSSCs) are a promising alternative to traditional silicon-based solar cells due to their cost-effectiveness, flexibility, and ability to perform well under low-light conditions. Here are some key prospects, Mechanism and future possibilities for DSSC technology:

A. Advantages Driving Future Gro wth

a) Cost-Effectiveness: DSSCs use inexpensive materials like titanium dioxide (TiO_2), dye molecules, and an electrolyte, making them cheaper than silicon-based solar cells. Simple fabrication techniques allow for low-cost production, potentially making solar energy more accessible.
b) Flexibility & Lightweight Nature: Unlike rigid silicon panels, DSSCs can be incorporated into flexible substrates. This opens up applications for wearable electronics, portable chargers, and solar fabrics.
c) Efficiency in Low-Light & Indoor Conditions: DSSCs perform well in diffused light, making them suitable for cloudy regions and indoor applications. They can be used in smart windows, indoor energy harvesting, and building-integrated photovoltaics (BIPV).
d) Colour Customization & Transparency: DSSCs can be designed in various colours and transparencies, making them ideal for architectural aesthetics. Potential use in skylights, greenhouses, and decorative solar panels.

B. Mechanism of DSSC

DSSCs are a type of thin-film solar cell that mimics photosynthesis to generate electricity. The key components include a photoanode, a sensitizing dye, an electrolyte, and a counter electrode. The working mechanism involves the following steps are shown in ***Figure a***:

1. Light Absorption (Photoexcitation)
The dye molecules adsorbed onto the surface of a nanostructured semiconductor (typically TiO_2) absorb sunlight. When light energy is absorbed, electrons in the dye get excited from the *ground state (S) to the excited state (S)**.

$$S + h\nu \rightarrow S^*$$

2. Electron Injection into TiO_2
The excited dye molecule (S*) donates an electron to the conduction band (CB) of TiO_2.This injection process occurs on a femtosecond (10^{-15} s) timescale.

$$S^* \rightarrow S^+ + e^-$$

The injected electrons move through the TiO_2 nanoparticle network toward the transparent conductive oxide (TCO) layer (e.g., FTO or ITO) and then flow into the external circuit.

3. Electron Flow in the External Circuit
The electrons travel through the external load, providing electrical power, and reach the counter electrode (cathode) (usually made of platinum-coated FTO).

4. Electrolyte Regeneration at the Counter Electrode
The iodide (I^-) in the electrolyte gets oxidized to triiodide (I_3^-) when donating electrons to the dye.

$$3I^- \rightarrow I3^- + 2e^-$$

At the counter electrode (cathode), tri-iodide (I_3^-) accepts electrons from the external circuit and is reduced back to iodide (I^-).

$$I_3^- + 2e^- \rightarrow 3I^-$$

This completes the cycle, ensuring continuous operation.

5. Regeneration of Dye Molecules
The oxidized dye (S^+) needs to regain an electron to return to its ground state.
The electrolyte (usually an I^-/I_3^- redox couple) supplies electrons to the dye, reducing it back to its original state.

$$S^+ + e^- \rightarrow S$$

C. Scopes of Improvements:

a) New Dye Materials for Higher Efficiency
Researchers are developing organic, metal-free, and quantum dot dyes to enhance light absorption and efficiency. Maximum solar light harvesting by using various kinds of dyes, nano-materials have been studied. b) Semiconductor Nanomaterials many semiconductors are already been developed like TiO_2, ZnO, ZrO_2 etc., composites or even with the doped.
b) Dye-Nano-particle interphase
Transferring maximum electron transfer from dye to se miconductor nano-material. Avoid other pathways like back electron transfer, energy transfer or recombination pathways.
c) Improve Mechanisms
New mechanical approaches like FRET [2], long-lived charge separation [1] also been tested with positive improvements.
d) Improve parameters : Open Circuit Voltage, Internal Resistance, Short Circuit Current, Maximum Power Point, Fill-factor and Incident Photon-to-Current Efficiency (IPCE) need to take care of for maximum efficiency.
e) Stability & Longevity Improvements: Traditional DSSCs face issues with electrolyte degradation. Solid-state electrolytes and ionic liquid-based alternatives are being explored to improve durability.
f) Tandem Solar Cells: DSSCs can be integrated with other solar technologies (e.g., perovskite or silicon tandem cells) to boost overall efficiency.

D. Potential Challenges :Lower Efficiency: DSSCs (~10–15%) still lag behind silicon cells (~20–25%). **There is a Long-Term Stability Issues regarding** liquid electrolytes can degrade over time, reducing performance. And another aspect is the **Scalability & Commercialization.** While DSSCs are easy to fabricate, mass production needs further refinement for better stability and efficiency.

E. Future Applications & Market Potential: Some handy applications of DSSC are Wearable electronics (smartwatches, fitness bands), IoT devices (indoor solar energy harvesting), Smart windows & BIPV, Agricultural applications (semi-transparent DSSCs for greenhouses) and Portable solar chargers & off-grid solutions.

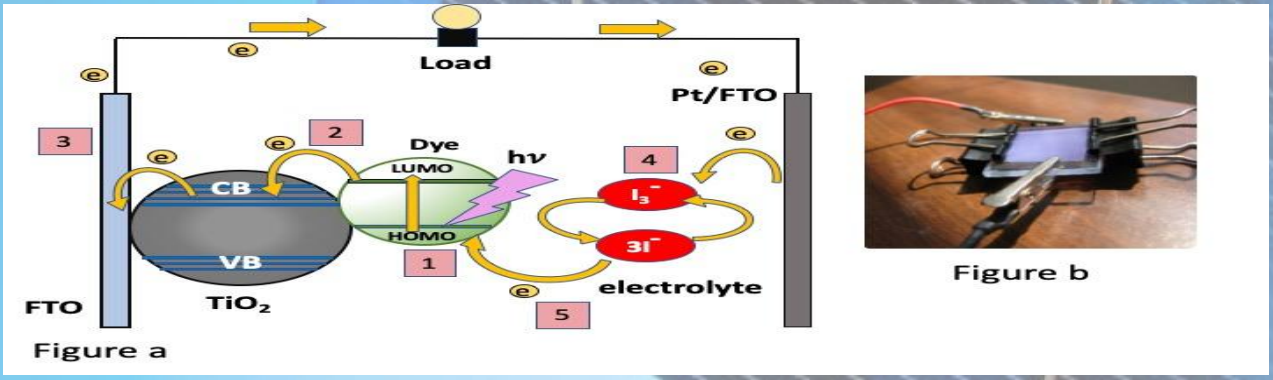


Figure a. A model DSSC based on the TiO_2 NPs; All possible electron chain mechanism of the embedded dyes to TiO_2 attached on FTO plate and Iodide couple as counter electron process as depicted in number. Figure b Laboratory made working DSSC

-Dr. Abhinandan Makhal
Assistant professor, Chemistry (BSH)

The Power of Soft Skills: Bridging the Gap Between Education and Industry

In today's fast-paced world, the technical knowledge gained through B.Tech, Diploma, and BBA programs is invaluable. However, one cannot deny the growing importance of soft skills in shaping well-rounded professionals ready to face the challenges of the industry. As companies evolve, they seek more than just technical expertise; they are looking for individuals who can communicate effectively, work well in teams, think critically, and adapt to new situations. Soft skills have become the bridge between academic knowledge and the professional world.

Soft Skills: Soft skills refer to a range of personal attributes that enable individuals to interact effectively and harmoniously with others. Unlike hard skills, which can be measured and quantified (like programming languages for a B.Tech student or financial analysis for a BBA student), softs kills are often less tangible but just as important. These include:

- **Communication Skills**: Being able to convey ideas clearly, both verbally and in writing.
- **Teamwork and Collaboration**: Working well with others towards a common goal.
- **Problem-Solving and Critical Thinking**: Approaching challenges analytically and finding effective solutions.
- **Leadership and Time Management**: Leading teams and managing tasks efficiently.
- **Adaptability and Emotional Intelligence**: Adjusting to changing environments and understanding the emotions of others.

The Present Industrial Requirement

Industries today are evolving at an unprecedented pace. With automation, artificial intelligence, and digital transformation reshaping how b usinesses operate, companies are seeking professionals who can not only perform technical tasks but also navigate these changes effectively.

1. **Communication Is Key**

While a B.Tech graduate may possess advanced programming skills, their ability to explain complex technical issues to a non-technical audience can make a huge difference in a collaborative setting. Similarly, BBA students are often required to interact with clients, present reports, or negotiate deals. Effective communication—both written and verbal—is essential to ensuring that ideas are understood and goals are met.

2. **Teamwork in a Globalized Workplace**

Most projects today require people to collaborate across different departments, cultures, and sometimes time zones. Companies look for candidates who can function well in teams, resolving conflicts when necessary and working toward a collective goal. For B.Tech and Diploma students, this could mean working with designers, engineers, or project managers.

BBA students may collaborate with marketing, finance, and operations teams.

3. **Critical Thinking for Innovation**

The ability to think critically and solve problems is in high demand. Industries need employees who can identify potential issues before they arise and innovate solutions. Whether it's coming up with a new app for a start-up or improving a business strategy for a corporation, being a problem-solver will set you apart.

4. **Adaptability in the Age of Change**

Industries are constantly evolving, and with the rise of new technologies, professionals need to embrace change. Whether it's adapting to new software in a BBA program or learning a new coding language for a B.Tech project, adaptability is a key skill that helps professionals stay relevant in their respective fields.

5. **Emotional Intelligence and Leadership**

For those looking to move into leadership roles, emotional intelligence (EQ) is critical. Having the ability to understand and manage your emotions, while also recognizing and influencing the emotions of others, allows professionals to lead effectively. Leaders need to motivate teams, resolve conflicts, and make tough decisions—skills that require strong emotional intelligence.

Why Soft Skills Matter for B.Tech, Diploma, and BBA Students

For students in B.Tech programs, soft skills such as teamwork, leadership, and adaptability are essential. The technical world is collaborative, and it's rare for any project to be completed by a single individual. The ability to work in a team, communicate complex ideas clearly, and adapt to shifting requirements will make you a more valuable asset to potential employers.

For Diploma students, soft skills are just as important. Many diploma holders enter the workforce in roles that require constant interaction with colleagues and clients. Good communication, problem-solving, and time management skills can make the difference between a successful career and stagnation. For BBA students, soft skills like negotiation, critical thinking, and leadership are key to excelling in the business world. BBA graduates are expected to engage in strategic decision-making, manage teams, and communicate with clients or stakeholders.

How Can Students Develop Soft Skills?

Participate in Group Activities: Engaging in group discussions, workshops, or extracurricular activities will help improve your communication, teamwork, and leadership skills.

Practice Public Speaking: Joining platforms like Toastmasters or simply presenting in front of your peers will help you become more confident in communication.

Seek Internships: Real-world exposure is invaluable. Internships provide a platform for you to hone your professional skills, work with diverse teams, and face real-time challenges.

Work on Problem-Solving: Engage in activities that require problem-solving—whether it's through case studies, puzzles, or group discussions.

Read and Stay Curious: Developing emotional intelligence involves understanding both yourself and others. Reading about human psychology, leadership, and communication can provide insights and enhance your EQ.

Conclusion

In conclusion, while academic knowledge and technical skills form the foundation of your career, it is the soft skills that will help you build strong professional relationships, adapt to changing environments, and succeed in the industry. The world is looking for individuals who can think critically, communicate effectively, and work collaboratively. By focusing on developing soft skills alongside your technical expe rtise, you will be better prepared for the challenges that lie ahead in your career.

So, whether you're a B.Tech, Diploma, or BBA student, remember: your technical skills will get you the job, but your soft skills will help you keep it and thrive. It's time to start honing those skills now for a successful tomorrow.

-Dr. Ankita Sahu
Assistant professor, English, BSH

CIVIL ENGINEERING: -

Trends and Innovations Shaping the Future

Sustainable Construction

Imagine a future where buildings are not just strong but also environmentally conscious! In civil engineering, sustainable construction is taking center stage. We're adopting materials and designs that are eco-friendly, ensuring our structures contribute positively to the environment. It's like giving our buildings a green makeover, making them sturdy while reducing their impact on the planet.

Smart Infrastructure

Bridges, roads, and buildings with a brain? Absolutely! Civil engineering is getting smarter by incorporating artificial intelligence and automation into our infrastructure. This means our structures can communicate, monitor themselves, and even make decisions. It's like giving our infrastructure a digital brain, making it not only robust but also intelligent and responsive to the world around it.

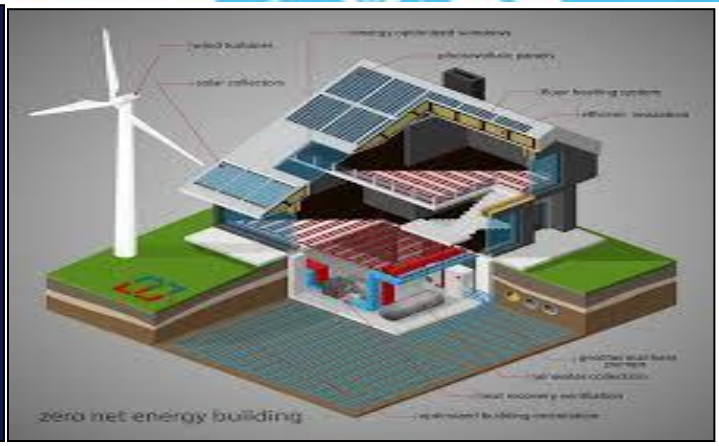
Advanced Materials

Welcome to the era of self-healing structures! Civil engineering is embracing advanced materials, including those influenced by artificial intelligence. Imagine materials that can detect and repair damage on their own, like self-healing concrete. It's not science fiction; it's the future of construction, where our buildings can maintain themselves, minimizing the need for constant human intervention.

Prefabrication and Modular Construction

Construction meets automation – it's like magic in the making! In civil engineering, we're incorporating automation

into prefabrication and modular construction processes. This means robots and automated systems play a role in creating building components off-site, streamlining the construction process. It's like watching automated systems put together a giant puzzle, making construction faster, efficient, and Inclusive and Diverse Practices



Energy-Efficient Designs

Efficiency meets intelligence in civil engineering! We're integrating artificial intelligence into designs to optimize energy usage. Imagine structures that can adapt their energy consumption based on real-time data. It's like having buildings that are not just energy-efficient but also smart enough to respond to their surroundings, making them more sustainable and eco-friendlier.

Artificial Intelligence and Automation

In civil engineering, we're ushering in a new age by integrating artificial intelligence (AI) and automation into our projects. AI is like the brainpower, enabling our structures to analyse data, make decisions, and even learn from experiences. Meanwhile, automation is the hands-on approach, employing robots and smart systems to carry out tasks traditionally done by humans.

Together, AI and automation revolutionize the way we conceive, design, and construct. From predictive maintenance using AI to automated fabrication processes, they ensure that our buildings are not just structures but living, adaptive entities. It's like having a dynamic duo – the brains and brawn – working seamlessly to redefine the possibilities of civil engineering in the future

-Suraj Kumar
Assistant Professor & HoD, CE

BUILDING THE FUTURE: THE RISE OF 3D PRINTED ARCHITECTURE

Imagine a world where homes are printed like a page from a book—layer by layer, rising from the ground in mere hours. What once seemed like a sci-fi fantasy is now a reality. 3D printing in construction is reshaping the way we think about building, blending technology, efficiency, and sustainability into one groundbreaking innovation.

HOW DOES IT WORK?

Forget bricks and mortar—think giant robotic arms, precision layering, and digital blueprints. Here's how a 3D printer constructs a building:

- **Step 1**: Digital Design – Architects create a 3D model of the structure using CAD software.
- **Step 2**: Material Magic – Instead of ink, a special mix of concrete, clay, or biodegradable materials is loaded into the printer.
- **Step 3**: Layer by Layer Construction – The printer extrudes the material, stacking it precisely to form walls, floors, and even domed roofs.
- **Step 4**: The Final Touches – Windows, doors, plumbing, and electrical systems are installed manually.

The result? A fully functional house in a fraction of the time it takes to build traditionally!

WHY 3D PRINTING? BECAUSE THE FUTURE DEMANDS IT!

- **Faster Than Ever** – A house can be printed in as little as 24 hours!
- **More Affordable** – Reduces labor costs and material waste.
- **Eco-Friendly** – Uses sustainable materials and generates less waste than conventional construction.
- **Innovative Designs** – Curved walls? Intricate patterns? No problem! 3D printing makes futuristic architecture possible.
- **A Solution for Housing Crises** – Affordable, durable homes could be the key to solving global housing shortages.

REAL-WORLD MARVELS: 3D PRINTING IN ACTION!

- **ICON (USA)** – Printing low-cost homes to tackle homelessness.
- **COBOD (Denmark)** – Built the world's first multi-story 3D-printed building.
- **NASA's Mars & Moon Habitats** – Testing 3D printing for space colonization!

From disaster relief shelters to luxury villas, the possibilities are endless!

WHAT'S NEXT? PRINTING THE FUTURE!

3D-printed skyscrapers? Underwater cities? Space colonies?
As the technology evolves, we might see entire neighborhoods 3D-printed with AI-powered robots and self-healing materials.
In the near future, you won't just buy a house—you'll download and print one!

The future of construction isn't just being built—it's being printed!

-Sandeep Raj
Assistant Professor, CE

Deep Learning: Redefining the Digital Environment with Deep Learning

Computer data processing and decision-making have been completely transformed by deep learning, a branch of machine learning and artificial intelligence (AI). Deep learning, which is distinguished by the use of artificial neural networks that are modeled after the human brain, allows machines to carry out activities like autonomous driving, picture recognition, and natural language processing that were previously believed to require human intelligence. The fundamental ideas, uses, and prospects of deep learning are examined in this article.

The Foundations of Deep Learning

Artificial neural networks, especially multi-layered ones known as deep neural networks (DNNs), are the foundation of deep learning. The nodes or "neurons" that make up these networks are arranged into three layers: input, hidden, and output. Over time, the system can learn and improve its comprehension as each neuron receives information and transmits it to the following layer. The ability of deep learning to automatically extract and learn hierarchical characteristics from raw data is what makes it so successful. Deep learning methods learn features directly from data, such as recognizing edges in photos or detecting sentiment in text, in contrast to typical machine learning techniques that need explicit feature engineering.

Deep learning model training usually requires substantial processing resources and vast datasets. These models modify their internal parameters to reduce error and increase accuracy by utilizing strategies like gradient descent and backpropagation. This training process has been accelerated in large part by recent hardware developments like GPUs and TPUs.

Applications of Deep Learning

Deep learning has permeated nearly every aspect of modern technology. Below are some of its most impactful applications:

1. **Computer Vision:** Deep learning powers image and video analysis tasks, including facial recognition, object detection, and medical image diagnostics. For example, convolutional neural networks (CNNs) are widely used in applications ranging from self-driving cars to automated cancer detection.
2. **Natural Language Processing (NLP):** Tools like transformers and recurrent neural networks (RNNs) enable machines to understand and generate human language. Applications include chatbots, translation services, and sentiment analysis.
3. **Speech Recognition:** Voice assistants like Siri, Alexa, and Google Assistant rely on deep learning to transcribe and interpret spoken language.
4. **Healthcare:** Deep learning models are transforming healthcare by predicting diseases, analyzing medical images, and personalizing treatments.

5. **Gaming and Simulation:** Deep reinforcement learning allows AI agents to outperform humans in complex games and simulations, as seen with AlphaGo and Dota 2.
6. **Autonomous Systems:** Self-driving cars and drones leverage deep learning to interpret sensor data and navigate complex environments safely.

Future Directions and Challenges

Deep learning has many obstacles despite its impressive accomplishments. Extensive processing power and large labeled datasets are necessary for deep neural network training, which can be expensive and time-consuming. Furthermore, deep learning models frequently function as "black boxes," making it challenging to understand how they make decisions. Efforts are being made to solve these problems. While advances in unsupervised and self-supervised learning attempt to lessen the need for labeled data, research into explainable AI (XAI) strives to increase the transparency of deep learning models. Deep learning's integration with other disciplines, like neuroscience and quantum computing, also has the potential to open up new avenues.

Conclusion

A key component of the AI revolution, deep learning is transforming how people interact with technology and spurring innovation across industries. Even though there are still obstacles to overcome, the ongoing development of deep learning methods and resources portends a time when intelligent systems will be even more powerful, widely available, and incorporated into daily life. As scholars and professionals continue to push the limits of what is feasible, deep learning will surely continue to play a crucial role in the digital age.

-Gunadhar Dey
Assistant Professor, CSE

Engineers and the Ethical Future of Artificial Intelligence

Artificial Intelligence (AI) is transforming industries, but its rapid growth brings ethical challenges. Engineers, as creators of AI systems, play a crucial role in ensuring these technologies are developed and used responsibly.

One major concern is **bias**. AI systems learn from data, and biased data can lead to unfair outcomes. Engineers must ensure datasets are diverse and representative to prevent discrimination. **Privacy** is another issue, as AI often relies on personal data. Engineers must prioritize user privacy and comply with data protection laws.

Transparency is also key. Many AI systems operate as "black boxes," making their decisions hard to understand. Engineers must create explainable AI systems to build trust. Additionally, **job displacement** due to automation is a growing concern. Engineers should consider the societal impact of their work and explore ways to reskill affected workers.

To address these challenges, engineers must integrate ethics into the design process, promote diversity in teams, and rigorously test systems before deployment. Advocating for regulations and educating the public about AI's capabilities and risks are also essential.

Real-world examples, like companies pausing facial recognition due to bias or using AI for social good, show how ethical AI can drive positive change. Engineers must ensure AI is not only powerful but also fair, transparent, and accountable.

In conclusion, engineers have a unique responsibility to shape the future of AI ethically. By prioritizing fairness, transparency, and societal impact, they can ensure AI benefits everyone. The true measure of progress lies not just in what we build, but in how we choose to use it.

-Bibek Bhakat
1st Sem , CSE

Introduction

In the era of Industry 4.0, predictive maintenance (PdM) has emerged as a transformative approach for maintaining electrical equipment. Traditional maintenance methods, such as reactive and preventive maintenance, often lead to unexpected failures or unnecessary repairs. Machine Learning (ML) is revol_utionizing PdM by enabling real-time monitoring, early fault detection, and efficient maintenance scheduling.

The Need for Predictive Maintenance in Electrical Equipment

Electrical systems, including transformers, circuit breakers, motors, and generators, are critical to industrial and commercial operations. Unexpected failures can cause significant downtime and financial losses. Predictive maintenance leverages ML algorithms to analyze historical and real-time data, identifying patterns that indicate potential failures before they occur.

Figure 1: Comparison of Maintenance Strategies – Reactive vs. Preventive vs. Predictive

How Machine Learning Enables Predictive Maintenance

Machine learning enables predictive maintenance by analysing sensor data, including temperature, vibration, current, and voltage, to detect faults early. Pre-processing ensures data accuracy, while feature engineering selects key indicators like transformer temperature variations and motor vibrations.

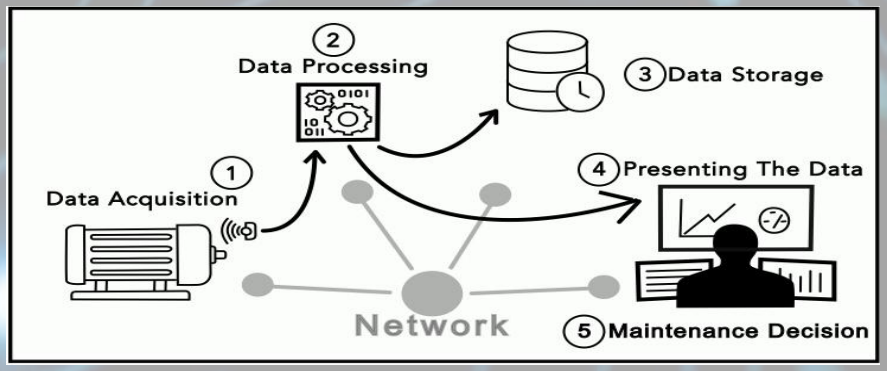


Figure 2: Data Flow in Predictive Maintenance

Supervised and unsupervised learning methods classify faults, while deep learning enhances detection. ML models predict remaining useful life (RUL), enabling proactive maintenance scheduling. This reduces downtime, extends equipment lifespan, and improves system reliability.

Benefits of Machine Learning in Predictive Maintenance

- **Reduced Downtime:** ML detects early signs of failures, preventing unexpected shutdowns.
- **Cost Savings:** Minimizes unnecessary maintenance and optimizes resource allocation.
- **Enhanced Equipment Lifespan:** Timely interventions reduce wear and tear, prolonging asset life.
- **Improved Safety:** Prevents catastrophic failures, ensuring workplace safety.

Challenges and Future Prospects

Despite its advantages, ML-based predictive maintenance faces challenges such as:

- **Data Availability and Quality:** Incomplete or noisy sensor data can affect model accuracy.
- **Implementation Costs:** High initial investment in sensors, computing infrastructure, and ML expertise.
- **Integration with Legacy Systems:** Many industries rely on traditional equipment that lacks smart sensors.

Future advancements in AI, IoT, and edge computing will further enhance predictive maintenance capabilities, making electrical systems smarter and more resilient.

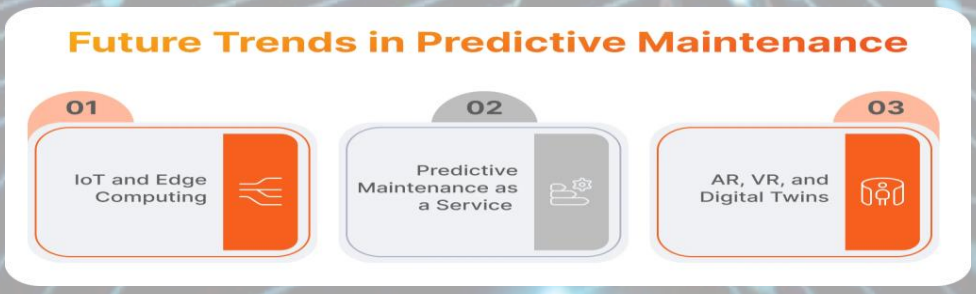


Figure 3: Future Trends in Predictive Maintenance Using AI and IoT

Conclusion

Machine learning is revolutionizing predictive maintenance in electrical engineering by enabling real-time monitoring, early fault detection, and optimized maintenance strategies. As technology evolves, ML-driven predictive maintenance will become an integral part of modern electrical systems, ensuring efficiency, reliability, and cost-effectiveness.

-Dr. Mantosh Kumar, Assistant professor
HoD, EEE

Electrical Signature Analysis: Revolutionizing Condition Monitoring for Industrial Machinery

Introduction

Electrical Signature Analysis (ESA) is a non-intrusive method for real-time machine monitoring, focusing on electrical data (current and voltage). Unlike traditional techniques like vibration analysis, ESA detects subtle operational changes that signal emerging faults, making it ideal for hazardous or hard-to-reach environments where physical sensors may not be feasible.

How ESA Works

ESA operates through two primary stages: data capture and data analysis:

- **Step 1:** Data Capture
  The first step involves the installation of permanent sensors within the motor control cabinet. These sensors are designed to continuously capture high-frequency electrical data from the machine. Unlike vibration sensors, which need to be attached directly to the equipment, ESA's sensors are strategically placed to monitor the electrical signals remotely.
- **Step 2:** Data Analysis
  After the data is captured, ESA employs advanced algorithms to process and analyze the electrical signals. The most fundamental technique used is the Fast Fourier Transform (FFT), which converts time-domain data into the frequency domain. This transformation reveals the machine's frequency signature, providing valuable insights into its operational state.
  In addition to FFT, ESA uses other methods such as:
  - ❖ Spectral Analysis: Identifies the strength of different frequencies within the electrical signal.
  - ❖ Power Analysis: Detects issues like voltage imbalance and harmonic distortion that can affect machine performance.
  - ❖ Lateral and Torsional Analysis: Provides information about rotational and back-and-forth movements, offering a complete picture of mechanical health.

Types of Faults Detected by ESA

ESA excels in identifying both mechanical and electrical issues early, enabling timely maintenance and reducing the risk of severe damage.

- ❖ Mechanical Fault Detection
- ❖ Electrical Fault Detection

Benefits of ESA: Real-Time Performance & Energy Monitoring

ESA is not just a fault detection tool; it also offers real-time insights into machine performance and energy efficiency, making it an invaluable asset for industries looking to optimize operations.

- **Real-Time Performance Monitoring**
  ESA provides real-time monitoring, detecting motor vibrations and energy spikes that signal issues like bearing wear or inefficiencies, allowing maintenance teams to proactively reduce downtime and extend machinery lifespan.
- **Energy Monitoring**
  ESA helps optimize energy usage, reducing costs and improving efficiency.
  ESA in Action: Case Studies and Real-World Applications
  The effectiveness of ESA can be demonstrated through a variety of real-world applications across multiple industries:

1. **Improving Pump Reliability in Power Plants**
   In a nuclear power plant, ESA was deployed to monitor two 350-horsepower motors that drive vertical service water pumps. By continuously monitoring the electrical signature, ESA detected potential mechanical issues before they caused downtime, significantly improving pump reliability.
2. **Identifying Transformer Faults in Wind Power**
   ESA was also applied to a transformer within a wind power system. Through the analysis of electrical data, ESA uncovered performance anomalies that pointed to an impending failure, allowing for early intervention.
3. **Pinpointing Gearbox Faults in Industrial Equipment**
   ESA helped identify a fault in the gearbox of a motor used in industrial equipment. By analyzing the electrical signature, ESA detected an unusual signal indicating looseness in the motor's mechanical components, leading to the discovery of a faulty gearbox.

Why Choose ESA Over Other Condition Monitoring Techniques?

ESA offers a cost-effective, efficient solution for detecting electrical faults like broken rotor bars and stator issues, providing significant advantages over traditional vibration-based monitoring in many industries.

Future Trends in ESA Technology

ESA is evolving to meet industries' demands for reliability, efficiency, and sustainability. With systems like SAM4, ESA offers remote 24/7 monitoring, ideal for hazardous or hard-to-reach environments. It also excels in early detection of electrical and mechanical issues, preventing breakdowns and costly downtime.

-Sumita Kharat
Assistant Professor, EEE

AI-Powered Mathematical Modeling: Transforming Problem-Solving

Modeling and Simulation (M&S) are essential tools across many scientific and engineering fields, allowing us to represent complex systems and processes without the need for physical experimentation. These tools have evolved significantly with the integration of Artificial Intelligence (AI), which offers advanced capabilities in key areas of M&S such as optimization, data analysis, and verification and validation. AI's ability to enhance M&S is evident in applications ranging from engineering and physics to social sciences and biology, providing innovative approaches to problem-solving and system understanding.

Mathematical Modeling is a powerful method for representing real-world systems or phenomena through mathematical formulas, equations, and algorithms. This approach helps analyze and solve complex problems by translating them into a structured mathematical framework. Key aspects of Mathematical Modeling include:

1. **Problem Definition:** Clearly defining the real-world problem to be modeled.
2. **Assumptions:** Making necessary assumptions to simplify the problem while preserving its essential features.
3. **Formulation:** Developing mathematical equations or representations based on these assumptions and the problem definition.
4. **Solution:** Using mathematical techniques or computational methods to solve the formulated model.
5. **Validation:** Comparing the model's predictions with actual data to ensure accuracy.
6. **Interpretation:** Analyzing the results in the context of the original problem and making any necessary adjustments.

Mathematical Modeling finds applications in various fields including physics, engineering, economics, biology, and the social sciences. AI is a game-changer for Mathematical Modeling, enabling the creation of more efficient and accurate models to address complex real-world challenges. Some key ways AI contributes to Mathematical Modeling include:

1. **Data Analysis and Preprocessing:** AI can process vast amounts of data, identifying patterns and trends that might be missed by traditional methods. It also helps preprocess data to ensure high quality, which is crucial for accurate models.
2. **Model Development and Optimization:** Machine learning algorithms can develop and fine-tune mathematical models by learning from data, improving model accuracy, and adapting to new information over time.
3. **Predictive Modeling:** AI excels at using historical data to forecast future trends, a capability that is invaluable in fields such as finance, weather prediction, and healthcare.
4. **Parameter Estimation:** AI can assist in estimating model parameters by finding the best-fit values that minimize errors, often using techniques like neural networks and genetic algorithms.

5. **Simulation and Scenario Analysis:** AI-driven simulations enable the exploration of different scenarios and their potential outcomes, which is valuable for decision-making processes like policy planning, risk assessment, and resource management.
6. **Automated Model Building:** AI can automate the process of constructing mathematical models, reducing the time and effort required by human experts and making modeling more accessible.
7. **Integration with Other Technologies:** AI can be seamlessly integrated with other technologies, such as the Internet of Things (IoT) and Blockchain, to develop comprehensive models that account for multiple factors and interactions. For example, in healthcare, AI-powered Mathematical Modeling can predict disease outbreaks by analyzing data from diverse sources like social media, hospital records, and environmental sensors. This integration improves the accuracy and efficiency of predictive models, enabling proactive decision-making and better healthcare outcomes.

AI has the potential to revolutionize the way we monitor and respond to disease outbreaks. By analyzing data from a variety of sources—including social media, hospital records, and environmental sensors—AI models can identify patterns that may indicate the emergence of an outbreak. This early detection can help health authorities and policymakers take proactive measures to prevent the spread of diseases and protect public health. For instance, during the COVID-19 pandemic, AI played a crucial role in tracking the virus's spread, predicting its trajectory, and even aiding in vaccine development. Additionally, AI can assist in monitoring other diseases such as influenza, dengue, and malaria by providing real-time insights and alerts.

-Dr. S.K Roy
Principal, BACET

Electronics and Communication Engineering: -

Quantum Computing and Its Impact on AI: Unlocking Limitless Potential

Artificial Intelligence (AI) has witnessed **unprecedented growth** over the past decade, revolutionizing industries such as **healthcare, finance, robotics, climate science, cybersecurity, and autonomous systems**, driven by advancements in **deep learning, neural networks, and large-scale machine learning models**. The exponential rise of AI is best exemplified by models like **GPT-3 (175 billion parameters), GPT-4, and DeepMind's AlphaFold**, which demonstrate the potential of AI in **natural language processing, drug discovery, and protein structure prediction**. However, as AI models continue to scale, **their computational and energy demands are becoming unsustainable**, pushing classical computing to its limits. Training large AI models today requires **exascale computing power**, with systems like **Nvidia's DGX SuperPOD** and **Frontier, the world's first exascale supercomputer**, consuming **megawatts of power**, making AI training expensive, time-consuming, and environmentally unsustainable. The demand for high-performance GPUs and TPUs has also resulted in a **global chip shortage**, restricting AI research and commercial deployment. **Moore's Law is reaching its physical limits**, with transistors approaching atomic scales, making further improvements in classical computing performance increasingly difficult. This computational bottleneck has led researchers to explore **Quantum Computing** as the next frontier in AI acceleration, promising unparalleled speedups for complex machine learning tasks. Unlike classical computers that process data in **binary (0s and 1s)**, **Quantum Computers leverage qubits**, allowing **superposition and entanglement**, enabling massive parallel computations. This makes Quantum Computing highly effective for **optimization problems, large-scale data analysis, cryptography, and combinatorial problems**, all of which are fundamental to AI.

Companies like **IBM, Google, Rigetti, Quantinuum, and China's Origin Quantum** are rapidly advancing in **quantum hardware**, with IBM's **Eagle (127 qubits) and Osprey (433 qubits)** setting the stage for **fault-tolerant quantum processors** capable of accelerating AI workloads. Google's **Sycamore Quantum Processor** has already demonstrated **quantum supremacy**, solving problems in seconds that would take classical supercomputers thousands of years. Quantum AI has the potential to **redefine neural network architectures, reduce AI model training times from months to hours, improve feature selection, hyperparameter tuning, and enhance AI's ability to process unstructured data across multiple dimensions**. One of the most significant applications of Quantum AI is in **drug discovery and material science**, where simulating molecular interactions is computationally infeasible for classical systems, but quantum-powered AI can accelerate breakthroughs in **cancer treatment, vaccine development, and new materials for energy storage**. In **finance**, Quantum AI can revolutionize risk analysis, fraud detection, and portfolio optimization by **processing vast datasets with extreme precision and efficiency**.

In **cybersecurity**, Quantum AI poses both a threat and an advantage, as **quantum cryptography** can render traditional encryption obsolete while simultaneously enabling ultra-secure communication networks. The integration of **Quantum AI with autonomous systems and robotics** will lead to **intelligent decision-making at the edge**, improving real-time navigation for **self-driving cars, drones, and space exploration**. Governments and enterprises are already racing to secure dominance in Quantum AI, with **China investing over $10 billion in quantum research**, while the **U.S. and EU have launched multi-billion-dollar initiatives** to advance quantum computing infrastructure. Companies like **Tesla, Microsoft, and Amazon Web Services (AWS)** are also exploring **Quantum AI applications** to gain an early competitive edge. The **military and defense sectors** are also heavily investing in Quantum AI for **real-time threat**

detection, battlefield strategy optimization, and advanced cybersecurity applications, further demonstrating its critical role in future technology landscapes.

As AI models become more **parameter-heavy and computationally intensive**, **quantum-enhanced AI systems will redefine efficiency and scalability**, reducing the reliance on **power-hungry silicon-based hardware**. Classical AI training consumes **enormous amounts of electricity**, with **GPT-3 alone requiring an estimated 1,287 MWh of energy**—equivalent to the yearly energy consumption of over **120 U.S. homes**. Quantum Computing, with its potential **exponential speed-ups**, allowing AI to process and learn from vast datasets with significantly **lower energy consumption and reduced carbon footprints**, making AI **more sustainable**.

Another key challenge facing AI today is the **slow adaptation of algorithms to complex problem spaces**, where traditional machine learning techniques struggle with combinatorial explosion and multi-dimensional optimization. Quantum AI will enable breakthroughs in **natural language understanding, real-time predictive analytics, and generative AI models**, facilitating **hyper-efficient AI assistants, real-time decision-making for industrial automation, and AI-powered personalized medicine**. Research institutions like **MIT, Stanford, and the Max Planck Institute** are already developing **quantum-inspired neural networks**, paving the way for AI architectures that can efficiently **leverage quantum computing's parallelism for large-scale deep learning models**. The fusion of **Quantum AI with neuromorphic computing**—where hardware mimics the human brain's processing capabilities—will further accelerate AI's potential by **integrating quantum mechanics with brain-inspired architectures**, enabling **highly efficient, adaptive, and self-learning AI systems**.

Despite the promise of Quantum AI, there remain **significant challenges** in making it commercially viable. Quantum computers require **extremely low temperatures (close to absolute zero) and highly stable qubits** to function effectively, with existing quantum hardware still prone to **high error rates due to quantum decoherence**. The development of **error-corrected, fault-tolerant quantum systems** is crucial for practical AI applications, with research focusing on **topological qubits and superconducting circuits** to enhance quantum stability. Governments and private-sector leaders must invest in **quantum software development, quantum cloud computing platforms, and AI-driven quantum simulators** to accelerate adoption and integration with existing AI systems.

Looking ahead, the race for **Quantum AI supremacy** will determine **which nations and companies dominate the future of technology**, as AI is no longer just about automation but about solving **fundamental problems in science, medicine, and industry**. The **$5 trillion AI economy by 2030** will be heavily influenced by how well Quantum AI is integrated into **large-scale data processing, edge computing, and next-generation AI architectures**. Those who invest today in **Quantum AI infrastructure, quantum algorithms, and hybrid computing models** will lead the next wave of **scientific discovery, technological progress, and economic power**. As we move forward, **Quantum AI is not just an option—it is a necessity** to overcome the fundamental limitations of classical AI and unlock the **next era of intelligence, automation, and computational supremacy**

-Dr. Pratyancha Prasad
Assistant Professor & HoD, ECE

Mechanical Engineering:
A Journey of Excellence and Innovation

The Department of Mechanical Engineering, established in the year 2007, has been a cornerstone of excellence in technical education. With a vision to carve a distinct niche in the field of mechanical engineering education in Jharkhand, the department has grown into a hub of innovation, research, and practical learning. It is dedicated to developing competent engineers who are prepared to contribute effectively to the advancement of the mechanical discipline, its applications, and entrepreneurship.

A Strong Foundation in Mechanical Engineering

The Mechanical Engineering Department is known for its robust curriculum, well-equipped laboratories, and highly qualified faculty members who bring years of academic and industrial experience. The faculty is deeply committed to imparting high-quality education while also ensuring that students receive hands-on training in various aspects of mechanical engineering. This holistic approach helps in nurturing the technical acumen of students and preparing them for the challenges of the industry.

One of the key strengths of the department is the staff-student collaborative interaction. Faculty members actively engage with students through mentorship programs, projects, and research activities. This fosters an environment where students feel supported, motivated, and driven to excel. The collaborative approach not only builds a strong academic foundation but also instills problem-solving skills, teamwork, and innovative thinking in students.

Striving for Excellence in Skill Development

The department continually strives to achieve excellence in classroom teaching and practical training. It follows a student-centric approach that ensures skill development at every stage of learning. The well-equipped laboratories allow students to gain practical exposure to various mechanical systems, such as automobile components, manufacturing technologies, thermal and fluid mechanics, and computer-aided design (CAD) software. These hands-on experiences enable students to bridge the gap between theoretical knowledge and practical applications.

Moreover, students are encouraged to participate in technical workshops, industrial training, and certification programs to enhance their knowledge and technical competencies. These initiatives help students stay updated with the latest advancements in the field and prepare them for the ever-evolving job market.

Industry Collaboration and Practical Exposure

One of the defining features of the department is its strong partnership with industries situated in and around Jamshedpur. The city, known as an industrial hub, provides ample opportunities for students to gain real-world exposure through industrial visits, internships, and live projects. The department has established collaborations with renowned companies to ensure that students receive hands-on experience in mechanical engineering applications.

Industry tie-ups also facilitate guest lectures and interactive sessions with professionals from leading companies. These sessions provide insights into the latest trends, challenges, and

opportunities in the field of mechanical engineering, thereby bridging the gap between academia and industry requirements.

Seamless Organization and Continual Growth

The Mechanical Engineering Department is committed to achieving seamless organization within the institute. The curriculum is regularly updated to incorporate the latest advancements in the field, ensuring that students remain ahead in the competitive world. The department also encourages interdisciplinary learning, allowing students to explore the intersections of mechanical engineering with fields such as robotics, artificial intelligence, and sustainable energy solutions.The department takes pride in its research initiatives and encourages students and faculty members to engage in cutting-edge research. Research projects focus on solving real-world problems, enhancing technological advancements, and contributing to the overall growth of the mechanical engineering discipline.

Beyond Academics: A Holistic Learning Experience

The department believes in the holistic development of students. In addition to academics, students are encouraged to participate in cultural activities, sports, and technical competitions. Events such as robotics competitions, project exhibitions, and technical symposiums provide platforms for students to showcase their talents and creativity.

Furthermore, student-led organizations and clubs allow students to develop leadership skills, teamwork, and professional networking. The department also organizes various seminars, expert talks, and alumni interactions to provide students with a broader perspective on career opportunities and industry trends.

Success Stories and Alumni Achievements

Over the years, the department has produced several successful alumni who have made significant contributions in various sectors, including automobile engineering, manufacturing, research and development, and entrepreneurship. Many of our graduates are now working with top companies, while others have pursued higher education and research in prestigious institutions. The success of our alumni is a testament to the quality of education and training provided by the department.

Future Prospects and Continuous Improvement

Looking ahead, the department aims to further enhance its academic and research capabilities. Plans are underway to introduce new specialized courses, advanced laboratories, and collaborative research initiatives. The focus remains on ensuring that students are well-prepared to meet the future challenges of the mechanical engineering industry. Additionally, the department is working towards strengthening international collaborations with reputed universities and research organizations. This will open up new avenues for student exchange programs, joint research projects, and global career opportunities for students.

-Dr. Kundan Kumar, Assistant Professor,
HoD, Mechanical Engineering

3D Printing: The Future of Manufacturing and Medicine

Revolutionizing Industries with Innovation

Imagine a world where entire houses are built in days, customized prosthetic limbs are created overnight, and human organs are 3D-printed to save lives. This is not science fiction—it is the reality of 3D printing, a revolutionary technology that is reshaping the manufacturing and medical industries.

3D Printing- 3D printing, also known as additive manufacturing, is a process that creates three-dimensional objects layer by layer from a digital model. Unlike traditional subtractive manufacturing, which removes material to create an object, 3D printing builds objects by adding material, reducing waste and allowing for greater design flexibility.

From industrial applications to healthcare breakthroughs, 3D printing is pushing the boundaries of **what is possible**.

3D Printing in Manufacturing: Faster, Cheaper, and Smarter

1. Rapid Prototyping and Product Design

Traditional manufacturing can take weeks or months to develop a prototype. With 3D printing, companies can create functional prototypes in hours, allowing for faster innovation and testing. Industries like automobile, aerospace, and consumer electronics are already using this technology for rapid product development.

✅ Example: Car manufacturers like Tesla and BMW use 3D printing to design and test new vehicle parts efficiently.

2. Construction and 3D-Printed Homes

The construction industry is embracing 3D-printed buildings, which are faster to build and more sustainable. Large-scale 3D printers use concrete, plastic, or even eco-friendly materials to construct houses, offices, and even bridges.

✅ Example: In 2021, a fully 3D-printed house was built in just 24 hours in the Netherlands.

3. Custom Manufacturing and Spare Parts

Industries are shifting towards on-demand manufacturing, where spare parts and components can be 3D-printed instantly instead of waiting for international shipments. This reduces costs, waste, and logistics challenges.

✅ Example: NASA is using 3D printing to create tools and equipment in space, reducing the need for resupply missions.

3D Printing in Medicine: Saving Lives with Technology

1. 3D-Printed Prosthetics and Implants

Patients with missing limbs or damaged bones can now receive custom 3D-printed prosthetics and implants tailored to their exact needs. This makes healthcare more affordable and accessible, especially in developing countries.

✅ Example: The organization e-NABLE provides free 3D-printed prosthetic hands for children worldwide.

2. 3D Bioprinting and Organ Transplants

One of the most groundbreaking advancements in medicine is bioprinting, where scientists use living cells to create tissues and organs. While full organ transplants are still in experimental stages, researchers have successfully printed human skin, heart valves, and liver tissue.

✅ Example: Scientists at Wake Forest Institute for Regenerative Medicine have 3D-printed functional human tissues for future transplantation.

3. Personalized Medicine and Drug Printing

3D printing allows for customized medications, where drugs can be tailored to an individual's needs. This is especially useful for cancer treatments, rare diseases, and pediatric medicine.

✅ Example: The FDA-approved 3D-printed epilepsy drug, Spritam, is designed for faster absorption in the body.

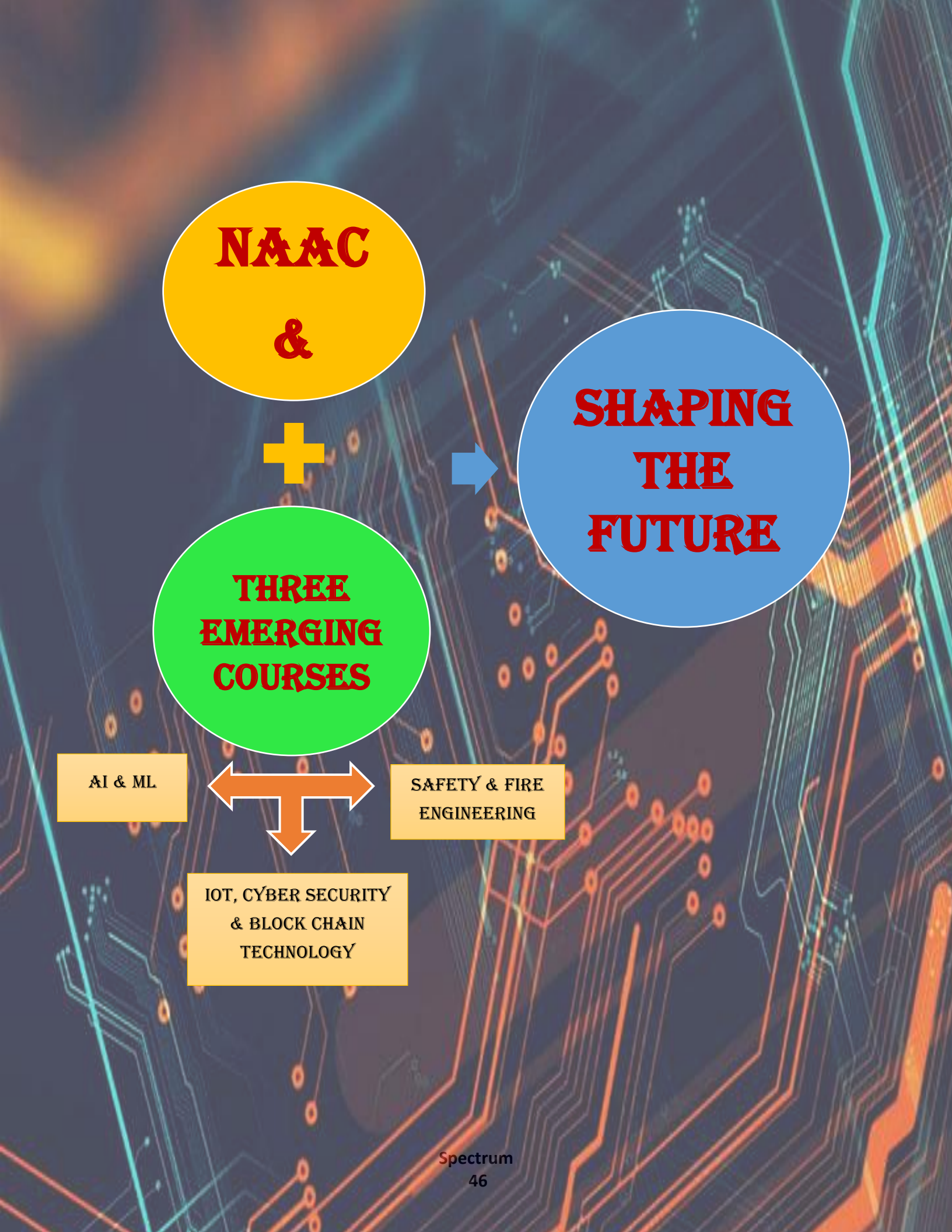
The Future of 3D Printing: What's Next?

With continuous advancements, 3D printing will soon become a mainstream technology in industries worldwide. From building smart cities to saving lives with bioprinting, this innovation is reshaping the world as we know it.

🌎 In the future, we won't just buy products—we'll print them.

🚀 Are we ready for the 3D printing revolution?

-Dr. Kundan Kumar,
Assistant Professor
HoD , Mechanical Engineering


NAAC
&
THREE EMERGING COURSES
AI & ML
SAFETY & FIRE ENGINEERING
IOT, CYBER SECURITY & BLOCK CHAIN TECHNOLOGY
SHAPING THE FUTURE

Preparing for NAAC Accreditation: A Milestone in Quality Education

Higher education institutions in India strive to uphold academic excellence, research innovation, and student-centric learning. One of the most prestigious benchmarks in assessing the quality of educational institutions is the **National Assessment and Accreditation Council (NAAC)** accreditation. Our college is currently undergoing this rigorous evaluation, demonstrating our commitment to continuous improvement and excellence in education.

Understanding NAAC Accreditation

NAAC accreditation is a comprehensive process that assesses institutions based on seven key criteria:

1. **Curricular Aspects** – Evaluating curriculum design, academic flexibility, and its effectiveness in meeting industry and societal needs.
2. **Teaching-Learning and Evaluation** – Assessing student-centric teaching methods, faculty qualifications, and learning outcomes.
3. **Research, Innovations, and Extension** – Measuring research output, patents, collaborations, and outreach programs.
4. **Infrastructure and Learning Resources** – Ensuring modern facilities, libraries, laboratories, and technological integration in learning.
5. **Student Support and Progression** – Enhancing student welfare, career guidance, and placement assistance.
6. **Governance, Leadership, and Management** – Evaluating institutional policies, administration, and strategic growth.
7. **Institutional Values and Best Practices** – Assessing social responsibilities, sustainability, and ethical initiatives.

Our Journey towards Accreditation

As part of the preparation for NAAC accreditation, our institution has undertaken several initiatives to enhance academic quality, infrastructure, and student development. Some of the key steps include:

- **Curriculum Enhancements**: following university provided Syllabus with industry requirements and emerging trends.
- **Faculty Development Programs**: Organizing workshops, training sessions, and research opportunities for faculty members.
- **Student-Centric Learning**: Adopting ICT-enabled teaching methods, skill development programs, and industry internships.
- **Research and Innovation Focus**: Encouraging faculty and students to participate in research, file patents, and collaborate with industry partners.
- **Upgraded Infrastructure**: Establishing state-of-the-art laboratories, digital libraries, smart classrooms, and eco-friendly campus initiatives.
- **Enhanced Student Support Services**: Strengthening mentorship programs, counselling sessions, and career guidance initiatives.
- **Community Engagement and Social Responsibility**: Conducting outreach programs, and environmental sustainability projects.

-Nilay Mandal (NAAC Coordinator & Assistant Professor, ME)

SAFETY AND FIRE ENGINEERING

Pioneering Safety: The Launch of Safety and Fire Engineering at BACET

A New Era of Engineering Excellence

In a significant step towards enhancing technical education, **B.A. College of Engineering and Technology (BACET)** proudly introduces the **Department of Safety and Fire Engineering**, established in **2024**. This program is designed to equip students with the knowledge and skills necessary to prevent, manage, and mitigate fire hazards and industrial safety risks.

Why Safety and Fire Engineering?

With rapid advancements in industrialization, urban development, and infrastructure growth, the demand for qualified safety professionals has never been higher. Safety and Fire Engineering plays a crucial role in protecting lives, assets, and the environment by ensuring compliance with safety regulations and implementing risk management strategies.

Curriculum & Learning Approach

The curriculum is a **blend of theoretical knowledge and practical exposure**, covering key areas such as:

- **Fire Dynamics and Prevention Techniques**
- **Industrial and Occupational Safety**
- **Disaster Management and Emergency Response**
- **Risk Assessment and Hazard Control**
- **Fire Protection Systems and Safety Audits**

The department is equipped with **state-of-the-art laboratories, simulation-based training, and real-world case studies** to enhance students' learning experiences.

Graduates from this department will be well-positioned for careers in:

🔥 **Fire and Safety Departments** (Government & Private)
🏗️ **Construction and Infrastructure Safety**
🏭 **Industrial Safety and Risk Management**
✈️ **Aviation & Marine Safety**
🛢️ **Oil, Gas & Chemical Industries**
🏥 **Hospital & Institutional Safety Compliance**

A Vision for the Future

With the launch of this department, **BACET reaffirms its commitment to producing highly skilled engineers** who can contribute to workplace safety, disaster prevention, and emergency response. As industries expand, the need for fire safety professionals will continue to grow, making this field an exciting and impactful career choice.

-Dr. Kundan Kumar
HoD
Safety and Fire Engineering

Artificial Intelligence (AI) and Machine Learning (ML) are rapidly advancing, shaping the future of various industries and redefining human-machine interactions. As AI continues to evolve, its integration into everyday life is expected to become more seamless and impactful. This article explores the future scope of AI and ML, highlighting emerging trends, potential applications, and associated challenges.

Future Trends in AI and ML

1. Advancements in Deep Learning

Deep learning models are becoming more sophisticated, enabling breakthroughs in natural language processing (NLP), computer vision, and autonomous decision-making. With increasing computational power and improved algorithms, AI systems will achieve human-like comprehension and reasoning capabilities.

2. AI-Driven Automation

Automation will continue to expand, reducing the need for manual intervention in various domains. AI-powered robots, intelligent chatbots, and self-learning systems will enhance efficiency in industries like manufacturing, logistics, and customer service.

3. Quantum AI

The fusion of AI and quantum computing holds immense potential. Quantum AI can solve complex problems faster than traditional computers, revolutionizing fields such as cryptography, drug discovery, and financial modeling.

4. AI in Edge Computing

Edge AI will allow real-time processing of data at the source, reducing latency and dependence on cloud computing. This will benefit IoT applications, smart cities, and autonomous vehicles, ensuring faster decision-making.

5. Ethical and Explainable AI

As AI becomes more integrated into society, ensuring transparency and fairness will be crucial. Researchers are developing Explainable AI (XAI) to make AI decisions more interpretable, reducing biases and increasing trust.

Future Applications of AI and ML

- **Healthcare**: AI will revolutionize personalized medicine, early disease detection, and robotic-assisted surgeries, improving patient outcomes

- **Finance**: Advanced ML models will enhance fraud detection, risk management, and automated financial advisory systems.
- **Education**: AI-powered adaptive learning platforms will personalize education, catering to individual student needs.
- **Autonomous Transportation**: Self-driving vehicles will become more reliable and widespread, reducing accidents and traffic congestion.
- **Space Exploration**: AI will assist in autonomous spacecraft navigation, planetary exploration, and astronomical data analysis.
- **Cybersecurity**: AI-driven security systems will proactively detect and prevent cyber threats, ensuring robust digital protection.

Challenges and Considerations

While AI and ML hold immense promise, challenges must be addressed to maximize their benefits:

- **Data Privacy and Security**: As AI systems rely on vast amounts of data, safeguarding personal information is critical.
- **Ethical Concerns**: Ensuring AI decisions align with human values and do not reinforce biases remains a significant challenge.
- **Job Displacement**: Automation may lead to workforce disruptions, necessitating upskilling and reskilling initiatives.
- **Regulatory Frameworks**: Governments and organizations must establish policies to guide AI development and usage responsibly.

Conclusion

The future of AI and ML is filled with transformative possibilities, from advancing scientific research to enhancing everyday life. By addressing challenges and promoting ethical AI development, we can harness these technologies for the greater good. As AI continues to evolve, it will play a pivotal role in shaping the future of industries, economies, and societies worldwide.

-Mr. Gunadhar Dey
Assistant Professor ,CSE
BACET

Cybersecurity: Safeguarding the Digital World

In today's interconnected world, cybersecurity has become an essential aspect of our daily lives. As technology continues to evolve, so do the threats that target individuals, businesses, and governments. Cybersecurity refers to the practice of protecting systems, networks, and data from cyber threats, ensuring confidentiality, integrity, and availability of information.

The Growing Importance of Cybersecurity

The rapid expansion of the digital landscape has led to an increase in cybercrimes such as hacking, phishing, ransomware attacks, and identity theft. Organizations rely heavily on digital infrastructure, making them prime targets for cybercriminals. As a result, robust cybersecurity measures are necessary to mitigate risks and prevent data breaches that could lead to financial and reputational damage.

Common Cyber Threats

1. **Malware Attacks** – Malicious software, such as viruses, worms, and spyware, infiltrates devices and compromises sensitive data.
2. **Phishing Scams** – Fraudulent emails or messages trick individuals into revealing confidential information, such as passwords and credit card details.
3. **Ransomware Attacks** – Cybercriminals encrypt a victim's data and demand a ransom for its release.
4. **Denial-of-Service (DoS) Attacks** – Attackers flood a network with excessive traffic, rendering it inoperable.
5. **Man-in-the-Middle (MitM) Attacks** – Hackers intercept and alter communication between two parties, often to steal data.

Best Practices for Cybersecurity

To combat cyber threats effectively, individuals and organizations must adopt cybersecurity best practices, including:

- **Using Strong Passwords** – Create complex passwords and enable multi-factor authentication (MFA) to enhance security.
- **Keeping Software Updated** – Regular updates help patch security vulnerabilities that cybercriminals exploit.

- **Avoiding Suspicious Links and Emails** – Be cautious when clicking on links or downloading attachments from unknown sources.
- **Implementing Firewalls and Antivirus Software** – These tools help detect and block malicious activity.
- **Data Encryption** – Encrypting sensitive information ensures that unauthorized users cannot access it.

- **Employee Training and Awareness** – Educating employees about cybersecurity threats helps prevent human errors that can lead to breaches.

The Role of Governments and Organizations

Governments worldwide have enacted stringent cybersecurity regulations and policies to combat cyber threats. Regulations like the General Data Protection Regulation (GDPR) and India's IT Act mandate organizations to protect user data and report security breaches. Companies must comply with t hese laws to ensure data protection and maintain customer trust.

The Future of Cybersecurity

As technology advances, cybersecurity will continue to evolve. The rise of artificial intelligence (AI) and machine learning (ML) offers new ways to detect and respond to cyber threats in real-time. Additionally, blockchain technology enhances data security by providing decentralized and tamper-proof records.

Conclusion

Cybersecurity is crucial in safeguarding personal and organizational data from malicious actors. By implementing strong security measures and staying informed about emerging threats, individuals and businesses can protect themselves from cyberattacks. As digitalization progresses, the need for robust cybersecurity will only grow, making it imperative for everyone to prioritize and invest in cybersecurity solutions.

-Himadri Bhusan Mahapatra
Assistant Professor & HoD, CSE

MOMENTS TO REMEMBER

Echoes of Enlightenment:

Faculty, Students Enrichment & Knowledge Forums

FDPs, Workshops, Seminars enhance faculties and students' skills, update knowledge, and improve teaching quality, fostering innovation and academic excellence. Glimpse are shown below:

Workshop on Project Management

Workshop on AI

Workshop on Android App Development

FDP on RM & Patenting Application

Workshop on Virtual Lab

Seminar on Gen AI

Workshop on Emerging Technologies

Seminar on Soft Skill

Workshop on Mentor Mentee

Workshop on PLC

FDP on Emerging Technologies

FDP on Emerging Technologies

From Our Yesterdays:

Celebrating Days and Milestones

Celebrating special days fosters awareness, inclusivity, cultural values, and holistic development among students and Faculties. Glimpse are shown below:

21st June: International Yoga Day

8th March: International Womens Day

14th September: Hindi Diwas

26th January: Republic Day

22nd March: World Water Day

23rd August: National Space Day

28th February: National Science Day

5th June: World Environment Day

Beyound Boundaries:
Ventures outside the Campus

These activities broaden exposure, enhance skills, inspire innovation, and build confidence through real-world learning and peer interaction among Students and Faculties. Glimpse are shown below:

Students Participation at Arka Jain College

Students Participation in model exhibition at NIT Jsr

Students after getting selected in Idea Pitching at JUT

World Water day campaign at Galudih Barage

Visit to Exhibition on NDT & Sensors at Golmuri

Visit to Machinery Expo at Auto Cluster

Visit to NIT during Deeksharamh

Visit to Russi Modi CoE

Idea Pitching Presentation in BIT Sindri

Faculties attending NAAC Workshop at Graduate School College for Womens

Faculty and Staff Picnic at Dobo Dam

Faculties attending Workshop on Setting Ques Paper

Rythms of Traditions:
A Cultural Tapestray

Cultural events promote creativity, unity, stress relief, and cultural appreciation, enriching student life. Students participated in events like Rangoli, Mehendi, Singing, Dancing, Ramp Show, Drama, Best out of Waste, Fireless cooking etc. Following are the Glimpse:

Diwali Celebration

Best out of Wastes

Saraswati Puja

Fireless Cooking

Rangoli

Holi Celebration

Singing during Deeksharambh

Traditional dance during Deeksharambh

Vishwakarma Puja

Dance during Deeksharambh

Act during Deeksharambh

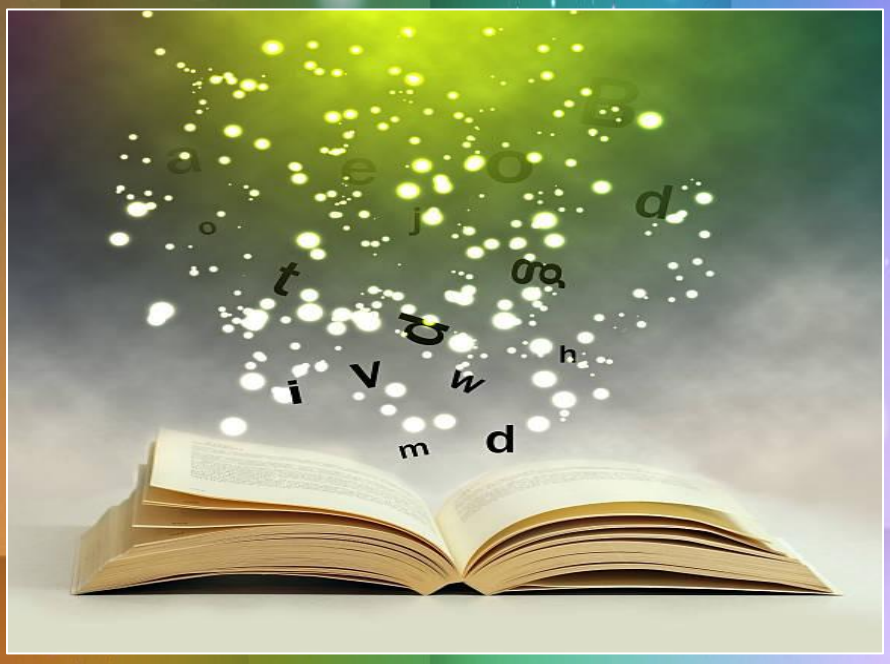
Fields of GLORY:
Sporting Triumphs & Tales

Sports Day promotes physical fitness, teamwork, discipline, and a healthy competitive spirit among students and faculties. Following are the Glimpse of Sports Day 2024:

WORDS

&

WISDOM



Hanuman Chalisa and the Distance Between Earth and Sun

The *Hanuman Chalisa*, a 40-verse devotional hymn dedicated to Lord Hanuman, holds a revered place in Hindu spiritual tradition. Composed by the 16th-century poet-saint Tulsidas, this sacred text is known for its powerful verses that praise Hanuman's strength, devotion, and divine attributes. Beyond its spiritual significance, a particular verse of the *Hanuman Chalisa* has intrigued scholars and scientists due to its apparent reference to the astronomical distance between the Earth and the Sun.

The Verse and Its Interpretation

One of the verses in the *Hanuman Chalisa* reads:

"जुग सहस्त्र जोजन पर भानू।
लील्यो ताहि मधुर फल जानू।।"

This translates to:

"The Sun is at a distance of 'Juga Sahasra Yojana,' and Hanuman swiftly flew towards it, mistaking it for a sweet fruit."

Here, the distance between the Earth and the Sun is described using ancient Indian units of measurement:

- **Juga (Yuga):** 12,000 years (in the context of one cycle of Yugas)
- **Sahasra:** 1,000
- **Yojana:** A traditional Indian unit of distance, where 1 Yojana is approximately 8 miles (or 12.8 km)

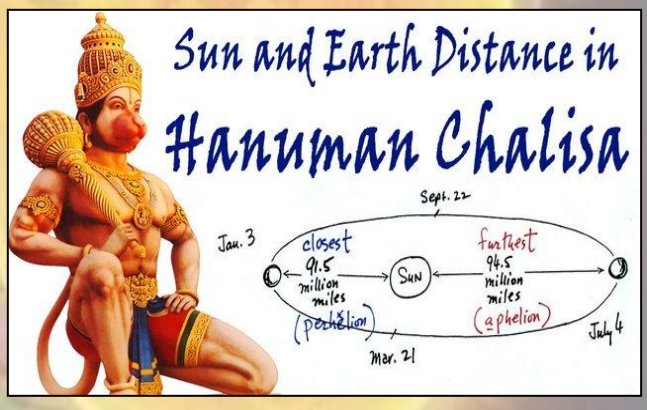
Mathematical Computation

Using these values, we can calculate the implied distance:

- Juga Sahasra Yojana = 12,000 × 1,000 × 8 miles
- = 96,000,000 miles

In kilometers:

- 96,000,000 miles × 1.609 = **154,828,800 km**



Scientific Correlation

Modern astronomical studies estimate the average distance between the Earth and the Sun to be approximately **149.6 million km (92.96 million miles)**, known as an Astronomical Unit (AU). Interestingly, the value derived from the *Hanuman Chalisa* is quite close to this scientifically measured distance. This has led many to marvel at the depth of knowledge encoded in ancient Indian scriptures.

The reference in the *Hanuman Chalisa* to the Sun's distance demonstrates the remarkable astronomical insights present in ancient Indian texts. While the numbers might not be exact in modern terms, their approximation indicates a sophisticated understanding of celestial bodies long before modern science. Whether viewed as a poetic allegory or an encoded scientific fact, this verse remains a fascinating example of the rich knowledge preserved in India's spiritual and literary heritage.

- Ranjan Ganguli
(Assistant Professor, (CSE))

हमारे कॉलेज के दिनों की गूँज

इन हॉलों में जहाँ हँसी गूंजती है

हम उत्सुकता से अपने सपनों का पीछा करते हैं।

पन्ने पलटते हैं और ऋतुएँ बहती हैं,

प्रत्येक पाठ के साथ, हम उठते और बढ़ते हैं।

ज्ञान के वृक्ष की छाया में,

हम अपनी जगह ढूंढते हैं, हम रहना सीखते हैं।

दोस्ती सुबह की रोशनी की तरह खिलती है,दिन-रात हमारा मार्गदर्शन करते रहे।

असफलताएँ सिखाती हैं, और सफलताएँ चमकाती हैं,

प्रत्येक कदम आगे, एक सितारा चढ़ना है।

परीक्षाओं, जयकारों और अंतहीन विद्या के माध्यम से,

हम ज्ञान के द्वार पर अपना भविष्य बनाते हैं।

जल्द ही एक दिन, हम अलग हो जायेंगे और घूमेंगे,

फिर भी यह हमेशा हमारा घर रहेगा।

क्योंकि हमारे दिलों में ये पल रहते हैं-

हमारे कॉलेज के दिनों की गूँज।

-Rakesh Mahato
(ME, B.Tech,1st sem

The Flow of Life: A Lesson from the Valley

In a serene valley, where the mountains whispered secrets to the wind and the rivers sang melodies of time, stood a lovely house lived a young boy named Prince with his Mom and Dad. He was very happy with his parents but sorrow soon cast a long shadow over his home. The sudden loss of his father left him broken, drowning in grief. His world stood still and with it, his dreams and ambitions. He stopped attending school, lost in his own sadness.

Noticing his absence, Prince's teacher grew concerned. He visited his home, where his mother revealed the reasons of his sorrow. Understanding his pain, the teacher decided to show him the way forward—not through mere words, but through the wisdom of nature itself.

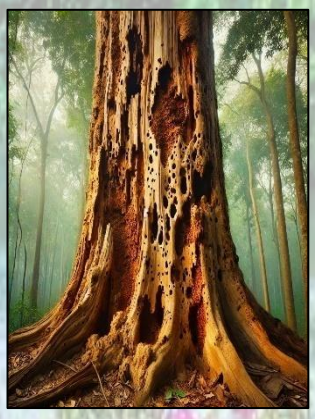
The River's Wisdom: Keep Moving Forward*

Taking Prince to the heart of the valley. He pointed towards the gushing river. "Look at the speed of this water" he said gently. "See how it flows, overcoming stones and rocks always finding its own way?"

Prince watched in silence as the river rushed past, never hesitating, never stopping. If you observe carefully, he continued "you'll see that just like this water we must move forward in life. Troubles and sorrows may try to block our path but if we stop we become stagnant. And you never know—**Just as this river nurtures the valley, your journey may help others one day."**

He scooped up some water in his hands and took a sip. **"This water quenches our thirst. In the same way, we should always strive to help others."**

The Hollow Tree: Beware of Negativity*



Then he led Prince to a towering tree, its bark riddled with termites. Look at this tree, he said. "From the outside, it still stands tall but inside these termites are slowly hollowing it out. One day it will collapse."

Prince's eyes widened. "Negativity works the same way" he explained. "If we focus only on our sorrows and surroundings, they will eat us from within. We must not let grief consume us. Instead we should fill ourselves with hope and purpose."

****The Bridge: Connecting Hearts****

Then the teacher took him to a simple wooden bridge stretching over a narrow river. The teacher smiled. "This bridge connects two sides bringing them together" he said. "And just like this, we should connect with people, share our joys and sorrows, and support one another."

Prince looked at him, something shifting in his heart. "Live in the present" he added. "Find happiness in the little things and life will always feel lighter."

****A New Beginning****

That day, Prince returned home with a newfound clarity. The next morning, he walked into school with a smile—no longer lost in sorrow but ready to embrace life with the wisdom of the valley.

Md. Waliullah
(Assistant professor ,Civil Engg.)

5 TOP SCIENCE NEWS

1. Smart windows could save energy. Tiny chemical in a liquid sandwiched between the panes of glass turn cloudy when they warm up. This will block some sunlight and potentially save on air conditioning bills.
2. Sometimes light is not so fast – The speed of light is often called a constant. Experiment now show that light doesn't always reach its top speed.
3. Bacteria help water effortlessly go with the flow – By adding bacteria to water , scientist were able to make a fluid flow with almost no resistance.
4. Long – sought subatomic particle seen last – Physicists have finally caught a brief glimpse of massless subatomic particle that were predicted to exist 85 years ago. It's the elusive well fermion.
5. House dust can make us fate – Materials found in dust including common fats may trigger human fat cells to grow. This might promote weight gain.

-Nayani Giri
(BCA 4th Sem)

The Journey of Student Life

Student life is one of the most transformative phases of a person's journey, filled with learning, challenges, and personal growth. It is a time when individuals develop crucial skills, build lifelong friendships, and lay the foundation for their future careers. While it is often associated with fun and freedom, it also comes with responsibilities and struggles that shape a student's character.

Academics play a central role in student life. Attending lectures, completing assignments, and preparing for exams require discipline and commitment. Time management becomes essential as students juggle multiple subjects, deadlines, and extracurricular activities. The ability to stay focused and organized helps in achieving academic success.

Beyond academics, student life is about exploration and self-discovery. College and school provide opportunities to engage in sports, cultural events, debates, and student organizations. These activities help students build confidence, leadership skills, and a sense of teamwork. The friendships formed during this time often become a strong support system, making the journey more enjoyable and memorable.

However, student life is not without challenges. The pressure to perform well, peer competition, and future uncertainties can sometimes cause stress and anxiety. Learning to handle setbacks, stay motivated, and seek help when needed are important life skills. Balancing academics with personal well-being is crucial to making the most of this phase.

Despite the ups and downs, student life is a time of dreams, aspirations, and self-improvement. It teaches valuable lessons beyond textbooks—resilience, adaptability, and the importance of hard work. The experiences gained during this period shape individuals into responsible and capable adults, preparing them for the journey ahead.

-Meghnath Pramanik
Mechanical Engineering,1st Sem

Hide Your Scars

Do not reveal your scars to others.
They are like mapmakers of sorrow,
tracing the pathways of your pain just to uncover your most vulnerable spots.
You mend yourself in quiet solitude,
but they tug at the seams,
enjoying the sight of you coming apart.

Do not disclose your failures to others.
They will measure them like heavy stones,
mocking the weight you bear.
Instead, collect those stones and build a throne out of them. Sit upon it—not as someone defeated,
but as a sovereign over the trials you've conquered.

Let your silence resonate louder than spoken words.
Let your scars bloom into wildflowers.
And as you move forward, you won't seek their validation—
you'll carry your own sky.

~Ananta chatterjee
lecturer, BSH

THE LIFE OF A DIPLOMA STUDENT

In the morning rush, with books in hand,
Through college gates, I make my stand.
A diploma dream, a path unknown,
In circuits and wires, my skills have grown.

The lectures long, the theories deep,
Some nights I barely get my sleep.
But in the lab, where sparks ignite,
I find my passion, clear and bright.
Soldering wires, fixing a glitch,
Turning ideas into a switch.
From motors whirring to circuits fine,
Engineering's pulse beats strong in mine.

Failures come, but I won't fall,
Each mistake, a lesson small.
With every test and every try,
I rise again, I aim so high.
One day soon, this road will end,
A job, a dream, the rules I'll bend.
For now, I learn, I grow, I strive,
A diploma student, strong, alive.

-S.K Afruddin
Diploma, EE 1st sem

ज़िंदगी के बाज़ार में

क़लम उठाता हूँ, तो ऐसा लगता है जैसे काग़ज़ पर अपनी रूह उकेर रहा हूँ। ये कहानी मेरी नहीं, मेरी जैसी अनगिनत आवाज़ों की है—वो आवाज़ें जो चीख़ बनकर भी कभी सुनी नहीं गईं।

मैं अक्सर सोचता हूँ, ये ज़िंदगी आख़िर है क्या?
साँसों का हिसाब? कामयाबी का पीछा? या बस...लोगों की उम्मीदों का बोझ?
पता नहीं।
शायद यही तलाश ही तो है, जो हमें ज़िंदा रखती है।

कई बार आईने में अपनी ही आँखों में झाँककर सोचा है — **मैं कौन हूँ?**
वो, जिसे लोग कामयाब कहते हैं? या वो, जो हर रात अपनी ही ख़ामोशियों से लड़ता है?
ये जो दुनिया मुझे देखती है, पहचानती है, सलाम करती है — क्या वाकई जानती है मुझे?

"हर चेहरा मुस्कान ओढ़े खड़ा है,
पर आँखों के पीछे छुपे सैलाब कौन देखता है।"

ज़िंदगी की ये दौड़ कब शुरू हुई, ठीक-ठीक याद नहीं। शायद तब जब पहली बार किसी ने कहा था —
"कुछ बनकर दिखाना, वरना दुनिया पूछेगी भी नहीं।"
तब से बस भाग रहा हूँ। मंज़िल के पीछे। पहचान के पीछे। एक ऐसे नाम के पीछे, जिसे लोग याद रखें।

कामयाबी मिलती गई, लोग सराहते गए, मगर भीतर कुछ खाली रह गया।
हर एक मक़ाम पर खड़े होकर पीछे देखा — रिश्ते छूटे, अपने पीछे रह गए, और जो साथ रहे, उनमें से कुछ चेहरे अब पहचान में नहीं आते।

"बुलंदियों का स्वाद फीका सा लगता है, जब अपना ही वजूद गुम हो जाता है।"

दुनिया बड़ी अजीब है।
जब तुम्हारे पास कुछ नहीं होता, तब तुम्हारी बातें भी बेमायने हो जाती हैं।
जब तुम्हारे पास नाम, कामयाबी, शोहरत आ जाती है, तब हर लफ्ज़ क़ीमती लगने लगता है।
ये लोग तुम्हारी हकीकत से नहीं, तुम्हारे हैसियत से प्यार करते हैं।

"लोग चेहरे की रौनक पे मरते रहे,
मैं अंदर ही अंदर बिखरता रहा।"

शुरुआत में ये बात समझ नहीं आई थी।
जब अपने ही जज़्बात को नज़रअंदाज़ कर लोगों की उम्मीदों पर खरा उतरने की कोशिश की, तो लगा यही असली ज़िंदगी है।
लेकिन वक़्त ने धीरे-धीरे सिखाया

इस दुनिया में सिर्फ़ दो ही लोग तुम्हारे अपने होते हैं
एक वो जो तुम्हारे दर्द को समझे, और दूसरा वो जो बिना कहे तुम्हारी खामोशी पढ़ ले।
बाक़ी सब वक़्त के हिसाब से अपने और पराए होते रहते हैं।

एक दौर वो भी आया, जब खुद से सवाल किया
जो मेरे साथ बैठे हैं, क्या सच में मेरे अपने हैं?
और जवाब मिला
जिन्हें तुम्हारे दर्द की आहट भी सुनाई दे, वो अपने हैं।
बाक़ी तो बस तुम्हारे हालात के मुसाफ़िर हैं।

"अपनों की भीड़ में जो ख़ामोशी पढ़ ले,
वो ही रिश्ता सच्चा है,
वरना तालियों की गूंज में तो हर कोई अपना लगता है।"

ज़िंदगी सिर्फ़ साँस लेने का नाम नहीं।
हर दिन, हर लम्हा, एक जंग है।
कभी हालात से, कभी ख़ुद से, कभी अपनों से।
इस सफर में सबसे मुश्किल होता है — लोगों को परखना।

कौन तुम्हें सिर्फ़ तुम्हारी जीत तक चाहता है?
ये दुनिया बड़ी अजीब है।
यहाँ लोग तुम्हारी तकलीफ़ से ज़्यादा तुम्हारी तरक्की से जलते हैं।

"मंज़िलों से ज़्यादा सफर की अहमियत
समझी है मैंने,
क्योंकि रास्तों ने ही सिखाया है,
कौन अपना है और कौन मुसाफ़िर।"

अब जब पीछे देखता हूँ, तो वो लड़का याद आता है जो सपनों की गठरी लिए चला था।
जिसे लगा था कि शोहरत ही सुकून है।
अब समझ आया, सुकून तो उन आँखों में था, जो तुम्हें तुम्हारी कमियों के साथ भी अपनाती हैं।
उन हाथों में था, जो तुम्हें गिरकर भी संभालते हैं।

"सुकून किसी मंज़िल में नहीं,
किसी अपने के कंधे पर सिर रखने में है।"

आज, इस मुकाम पर खड़े होकर समझ पाया
कामयाबी जरूरी है, मगर वो सब कुछ नहीं…
जो तुम्हें तुम्हारी ख़ामोशी में भी समझे, वो दौलत है।
और जो तुम्हारे दर्द की क़ीमत समझे, वो इबादत है।

बाक़ी ये दुनिया तो बाज़ार है
जहाँ तुम्हारी कीमत तुम्हारी कामयाबी से तय होती है।

"ख़ुद से दोस्ती सबसे मुश्किल है,
पर जब ये हुनर आ जाए,
तो दुनिया की बेरुख़ी तकलीफ़ नहीं देती।"

अगर कभी किसी मोड़ पर खुद को अकेला पाओ,
तो ये मत समझना कि दुनिया ने हराया है।
शायद ये वो वक़्त है जब ज़िंदगी तुम्हें तुम्हारी असली पहचान देने वाली है।

"कुछ रिश्ते तिजारत जैसे होते हैं,
वक़्त पे मोल लगाते हैं और मुनाफ़ा देखकर
निकल जाते हैं।
जो बिना कीमत लगाए साथ खड़े रहें,
बस वही तुम्हारी ज़िंदगी का हासिल हैं।"

ये कहानी सिर्फ़ एक शख़्स की नहीं,
ये उनकी भी है जो हर रोज़ मुस्कुराते हुए अंदर ही अंदर टूटते हैं।
जो अपने जज़्बात सीने में दफन कर दुनिया के सामने मजबूत बने रहते हैं।

शायद तुम्हारी भी हो।
शायद मेरी भी।

कभी खुद को इस कहानी में ढूँढ कर देखना,
शायद अपना ही अक्स मिल जाए।

-Enamul Haque
Assistant Professor, EEE

DEEP LOVE MATHS

Divide the 1st number by nothing, undefined,

That's the meaning of True Love,
Even the highest integer in a form of positive,
Cannot explain why this thing is greater than any negative.
When you expand this formula of "X" and why ?
Why this "X" is = to 1 + 1 is = to us ?
What is our common factor ? Let me tell you in a simplest form,
Our destiny is collinear and coplanar.
Parallel wherever we are.
In the start, connection is
at the end of Hypotenuse,
Problems make us become variables,
Inequalities make us strong.
But I found out that ½ of my heart fits yours,
I chose,
Our life is an equation, we cannot like a proportion.
Whether our time acts like an acute,
100% I will give it all just for you.
Our hands intersect with each other
It so perpendicular as our eyes knew it better ever
And as I push the number 8 into the ground It became infinity the sign of my heart
76 + 67 is in commutative property
Where N is = to 143.
These are words that I just want to say
Let us make a perfect love story.
Using the square root.
Of the prime tree, as I say,
Please let me stay with you,
Forever and ever, EVERYDAY.
My love Maths , please be with me forever to make
Make my incomplete life complete.

-Nayani Giri
BCA 4th sem

ARTISTIC EXPRESSION

-S.K Afruddin (Diploma 1st sem,EE)

-Shobha Kumari (B.Tech 6th sem, CSE)

-Chand Singh (B.Tech 1st sem, ME)

-Enamul Haque (Assistant Prof., EEE)

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