TIRESIA

Volume 16, Issue 3

The Editorial Board

-Beckoning Creati'wit'y

June Issue

Eclectic Essence

#World Music Day

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Amidst the tacit collusion of firmament and skyline, June asserts its sovereignty, as the solar sphere inexorably ascends toward its estival apex, inundating the terrestrial realm with incandescent splendour and calibrated lucence. Poised within the threshold betwixt spring's lambent pulchritude and summer's fervid incandescence, the world lingers in aporic augury. As horizons glisten beneath diaphanous veils of torrid mirage, sentient flames stir from torpor, aching for quietus, floraison, and numinous rekindling. The mellifluent susurrus of mango boughs and the ambrosial redolence of aurorine jasmine proclaim the advent of sanctified revelries like Ganga Dussehra and the opalescent procession of Rath Yatra. Amid the vaulted hush of the solstitial firmament, June 21 summons humankind to a reticent benediction, where soma and soul coalesce in a hallowed quest for equipoise and inward sanctum. Astral gloam unfurls as Bootid meteors flare through the indigo vault, etching fleeting glyphs upon a velvet sky. From within solstitial stillness and the aureate intonings of an opaline prelude, June ascends as aresplendent arras, interlaced with fervid portent and an eirenic plume, ushering a lambent cadence into life's unfurling odyssey.

Across the national spectrum, India staged the Global AI Summit in Bengaluru from June 10, 2025 to June 12, 2025, as PM Modi envisioned the nation's ascendancy to the mantle of "AI Capital of the World". However, this fervent optimism gracefully crescendoed into a moment of national pride when, on June 23, 2025, as Tripura was declared fully literate, attaining a 95.6% adult literacy rate under the ULLAS–Nav Bharat Saaksharta Karyakram. Amid escalating Middle East hostilities, Israel's strike on Iran on June 13, 2025 prompted the United States to launch Operation Midnight Hammer on June 22, 2025, triggering volatile oil market surges. In response, the Government of India initiated Operation Sindhu, a meticulously coordinated mission aimed at ensuring the swift, secure, and organized repatriation of its citizens stranded in conflict-affected zones like Iran and Israel. On June 21, 2025, India celebrated World Music Day, honoring the unifying power of music across cultures and boundaries. Meanwhile, on the domestic sphere, RCB finally secured their long-elusive IPL coronation on June 3, 2025 while Neeraj Chopra soared to triumph in Ostrava on June 24, 2025, further magnifying India's constellation of athletic accolades. Ostrava on June 24, 2025, further magnifying India's constellation of athletic accolades.

Through evolving paradigm, MMMUT undertakes a CubeSat-class nanosatellite with ISRO, fortifying its technological stature. The 10×10×10 cm satellite represents the university's pursuit of scientific relevance. In tandem, MMMUT envisions a Happiness and Human Assessment Lab to integrate well-being into academics and foster holistic growth. Further expanding its academic architecture, the University launched a five-year integrated law programme via CLAT, aligned with the rigour and standards of National Law Universities. Yoga sessions themed 'Yoga for One Earth One Health' exemplify ecological consciousness and nurture holistic growth. In the academic year 2024-25, MMMUT's placement success for 930 students reflects not only its industry alignment, educational relevance, and rise as a hub of interdisciplinary excellence.

As daylight billows and the zephyrs burgeon with aureate prophecy, June departs as a prismatic cartographer of interstitial realms, engraving the year's seraphic inflection with cradled unveilings, reillumined sojourn, and exultation sprouting encased in the sylvan lilt of summer's ascension. Eventide lays a silver veil over dusk, turning each ray into a cipher of evanescent marvels and beckoning infinitudes. With half the year behind us, possibilities flare like constellations against midnight skies; Earth thrums beneath Sol's blaze, echoing symphonies and revitalized verve for the peregrination unravelling. With reawakened fervency and tempered discernment, **The Editorial Board** takes immense pride in unveiling the June edition of Tiresia, conveying our earnest invocations for a solstice brimming with insight, renewal, and euphoric efflorescence.

bienvenidos!

Our Team

Final Year Members: Abhijeet Yadav, Aditya Raj, Akanksha Pal, Akshat Saxena, Awantika Krishna, Harshita Mishra, Khwaab Jaiswal, Lavanya Gupta, Mayank Jaiswal, Nadeem Ahmed Warsi, Nikhil Tiwari, Saanvi Gupta, Shreyas Kumar, Swati Tiwari

Third Year Members: Aadrika Barnwal, Aastha Singh, Harshit Pandey, Jayant Singh, Jyoti Singh, Nandini Mishra, Prisha Agrawal, Shivam Pal, Shivam Rai, Sneha Verma, Vishal Kotak, Vishwadeep Singh, Vivek Mani Tripathy, Yash Pratap Singh

Second Year Members: Aditi Sharma, Akshay Kumar, Alok Kumar, Ashmi Singh, Divyansh Singh Rathore, Gaurav Vishwakarma, Himanshu Mishra, Jagriti Singh, Pragya Kumari, Pranav Mishra, Shatakshi Srivastava, Shrestha Gupta, Vaishnavi Rai, Vinayak Yadav, Yashvardhan Ojha

MESSAGE FROM *Faculty Advisor*

Dr. Virendra Kumar
Faculty Advisor

Madan Mohan
Malaviya University
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Gorakhpur - 273010

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It is with a deep sense of honour and purpose that I share this message as the newly appointed Faculty In-Charge of the Arts and Literary Sub-Council. This platform has long stood as a vibrant confluence of imagination, articulation, and intellectual inquiry. I am both humbled and energised by the opportunity to contribute to a legacy that continues to shape the creative and cultural spirit of MMMUT. At the outset, I wish to acknowledge the exemplary contributions of the former members of **The Editorial Board**. Their unwavering dedication and thoughtful initiatives have enriched the University's literary and artistic landscape. To the new members, I extend a warm welcome, together, we inherit a legacy of ideas and inspiration, and it is now our collective responsibility to build upon it with clarity, creativity, and conviction.

This academic year has witnessed significant milestones including the signing of a MoU with Rashtriya Raksha University, Gandhinagar, in the gracious presence of Hon'ble Chancellor and Governor of Uttar Pradesh, Smt. Anandiben Patel Ji, marking a strategic step forward in interdisciplinary collaboration. Further reinforcing our commitment to emotional well-being of the students, the University is set to establish the Happiness and Human Assessment Lab. The enthusiastic observance of International Yoga Day 2025 across the campus echoed our shared belief in the harmony of mind, body, and environment under the theme "One Earth, One Health". MMMUT's growing global relevance was reflected in its commendable performance in the Times Higher Education Impact Rankings 2025, particularly across key Sustainable Development Goals such as Clean Water and Sanitation, Affordable and Clean Energy, and Good Health and Well-being.

On the academic front, the introduction of a Minor Degree in Robotics and Automation and the establishment of a cutting-edge laboratory in the Mechanical Engineering Department, signifies our pursuit of excellence in emerging fields. Simultaneously, the Center for Excellence in Electrical Testing and Energy System Reliability stands poised to drive innovation and rigorous research. Our students remain the pulse of this University. The selection of five scholars under the prestigious AICTE Doctoral Fellowship scheme bears testimony to the academic culture and scholarly momentum nurtured on campus.

As we look ahead, I envision the Arts and Literary Sub-Council as a dynamic forum where literature, language, culture, and critical thinking converge. Through festivals, debates, creative writing initiatives, and collaborations, we aim to foster a space that not only reflects but enriches the intellectual life of the University. I remain grateful to the University leadership, my peers, and our ever-inspired student community for their trust and support as we begin this new chapter, rooted in reflection, driven by creativity, and united in purpose.

With best regards
Dr. Virendra Kumar
Faculty Advisor
The Editorial Board
MMMUT

Tête-à-tête

A talk with Mr. Vikky Lakhmani

Mr. Vikky Lakhmani, an accomplished professional from the 1999 batch of Electronics and Communication Engineering at Madan Mohan Malaviya University of Technology (formerly MMMEC), has carved a distinguished niche for himself in the domains of solar energy and construction management. With a forward-looking vision and a deep understanding of sustainable technologies, he has been instrumental in driving impactful initiatives that align with the global shift towards renewable energy solutions. Mr. Lakhmani's work stands at the intersection of innovation and infrastructure, reflecting his commitment to both technological advancement and environmental stewardship. **The Editorial Board** is honoured to spotlight Mr. Vikky Lakhmani's remarkable professional journey and draw inspiration from his contributions to the ever-evolving landscape of green energy and infrastructure.

Q How does returning to the campus and reuniting with old batchmates rekindle and awaken your long-held emotions?

A Revisiting the University after so many years was an experience marked by profound emotional resonance. The sight of familiar faces and the warmth of shared laughter evoked a deep sense of joy and a vivid recollection of our youthful days filled with both lighthearted mischief and pivotal moments. Walking once more through the hostel corridors and occupying the same classrooms where our aspirations once took shape stirred powerful memories. This return underscored for me the invaluable nature of the relationships cultivated during those formative years, as they continue to shape my personal and professional identity in significant ways.

Q What shifts or evolutions stand out to you as testaments to the University's passage through time?

A It's remarkable how time quietly transforms the spaces we once called our own. Walking through the campus after so many years, I am truly moved by the changes the University has embraced over the past two decades. The transformation is both impressive and inspiring. The new administrative building and upgraded facilities reflect thoughtful progress and a commitment to growth. Yet, beyond the physical changes, what struck me most was the shift in the student community. In our time, the campus was a melting pot of cultures, drawing students from every corner of the country. That diversity deeply enriched our experience. Today, the environment feels more localized. While not a drawback, I believe cultural variety plays a vital role in shaping open, well-rounded individuals. I also noticed many of our former professors have moved on, making way for a new generation of educators. It is a clear reminder that while traditions are valuable, evolution is essential.

Q Do you consider the bonds formed during your college days to be lasting and impactful?

A Yes, and I can say with absolute certainty that the friendships I formed during my college years are among the most enduring and meaningful relationships in my life. There is a certain magic to the season of life called college - a delicate balance of newfound independence and boundless idealism. It's when we begin carving out our values and choices, yet still dare to dream unreservedly. The friends we gather then see us in our purest, most unfiltered form. Together, we stumbled, learned, and grew, connected through late-night study marathons, shared grievances over mess food, and silent solidarity in moments of struggle. Though time and distance have carried us into separate journeys, those bonds remain unshaken, nurturing both my emotional well-being and the foundation of my personal and professional worlds.

Q Would you like to share the story of how your path unfolded into the pursuits that now occupy your time and passion?

A Currently, I am working in the solar energy sector and construction management. Though my academic background is in Electronics and Communication Engineering, I hadn't initially envisioned a path in solar power or real estate. Over time, I realized that beyond formal education, what truly matters is the ability to learn, adapt, and stay committed to one's purpose. Like many entrepreneurial journeys, mine began with limited resources and moments of self-doubt and financial

> *The friends we make during this period often see us as our most unfiltered and raw selves.*

hurdles. Yet perseverance and a clear vision kept me moving forward. Opening up to peers and mentors proved invaluable, offering guidance and support. With steady dedication, new opportunities emerged, and I feel fortunate to have shaped the path that brought me to where I am today.

Q What insights or guiding principles would you offer to those contemplating the entrepreneurial path?

A In reflecting on my own journey, I have come to believe that entrepreneurship is as much about people and purpose as it is about ideas. For those stepping into this path, I would say, start nurturing your professional network as early as you can. Platforms like LinkedIn, industry forums, and startup communities hold immense value for learning and collaboration. Equally important is exploring government initiatives such as MSME schemes, which offer vital support through funding, mentorship, skill development, and incubation opportunities-tools that help young ventures grow sustainably and tackle early hurdles. Yet, above all, let your pursuits be driven by what truly resonates within you. Don't chase trends or mimic others' successes, build something that fuels your own passion, and the rewards will inevitably follow.

Q How did your time at this University shape your personality and career?

A The time I spent at this University was truly transformative for me. Before joining, I was fairly reserved, someone who found it difficult to speak in public or share opinions in a group. But the University provided me with an environment that was both academically enriching and emotionally nurturing. By actively participating in team assignments, organizing college fests, or dealing with peer conflicts, I learned how to listen, articulate, empathize, and lead. These soft skills turned out to be just as critical as my technical knowledge when I entered the professional world. What also made a difference was the exposure to students from different backgrounds and disciplines. It gave me a broader perspective on life, career, and society. Today, when I negotiate business deals or manage a team, I often find the emotional intelligence and interpersonal skills I developed here quite helpful. In many ways, this University didn't just prepare me for a job, it prepared me for life. And for that, I'll always be grateful.

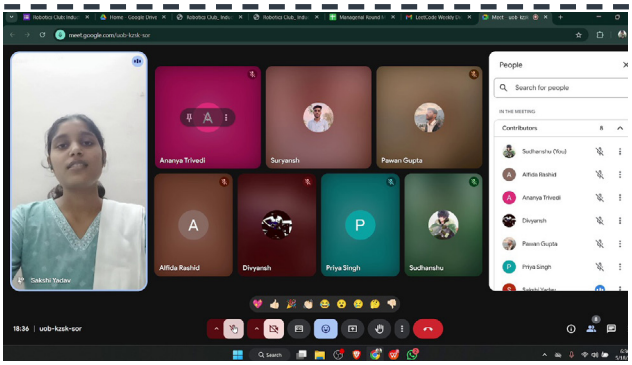
Q Is there any final piece of advice you hope to impart to students shaping their journeys here?

A College is the crucible where your future self takes shape. The friendships you forge, the trials you endure, and the experiences you seek all sculpt your mindset, values, and identity. Don't reduce college life to just chasing grades or securing a placement, they are merely parts of the puzzle. Participate in clubs, take up leadership roles, volunteer, explore hobbies, and, most importantly, engage with your peers. Connect with people beyond your friend circle and seek to understand diverse perspectives. Occasionally set aside your phone and truly observe the world around you, authentic conversations often impart wisdom far surpassing any post or reel. This University offers treasures well beyond textbooks, embrace each experience fully and remain steadfastly true to yourself. The choices you make and the dedication you invest during these formative years will profoundly influence the opportunities and pathways your future unfolds.

Mr. Vikky Lakhmani advancing his project

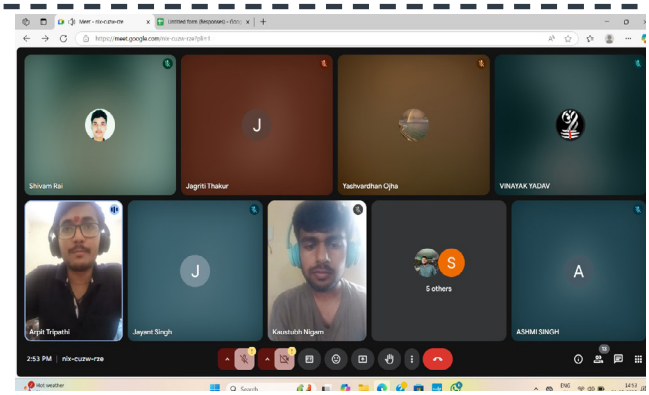
MAY 12 The **Computer Engineering Society** conducted its Induction Drive from **May 12, 2025** to **May 16, 2025**, featuring a comprehensive three-stage process comprising Resume Shortlisting, Technical Interview, and Behavioral Interview. The highly engaging drive reflected the enthusiasm, dedication, and professionalism of first-year students eager to actively contribute to the society.

MAY 16 The **Robotics Club** conducted its Induction Drive from **May 16, 2025** to **May 18, 2025**, enthusiastically inviting fresh minds to step into the world of innovation and intelligent design. Guided by the vision, 'Innovation is seeing what everybody has seen and thinking what nobody has thought', the drive aimed to onboard passionate and curious learners into the club's futuristic ventures.



MAY 31 The **Students' Library Committee** conducted the 5th edition of its popular Monthly Quiz Series, titled **"Time of Civil Services"**, on **May 31, 2025**, in online mode. The quiz tested participants' knowledge of current affairs, five-year plans, and the Indian freedom struggle. Top scorers were rewarded with exciting goodies and certificates, fostering curiosity and encouraging broader student engagement.

MAY 31 The **Cultural Sub-Council** organized a series of online competitions on **May 31, 2025**, to commemorate the **300th birth anniversary of Rani Ahilyabai Holkar Ji**. Events such as debate, essay writing, and painting celebrated her enduring legacy in governance, social reform, and women's empowerment, drawing enthusiastic participation from students across departments.



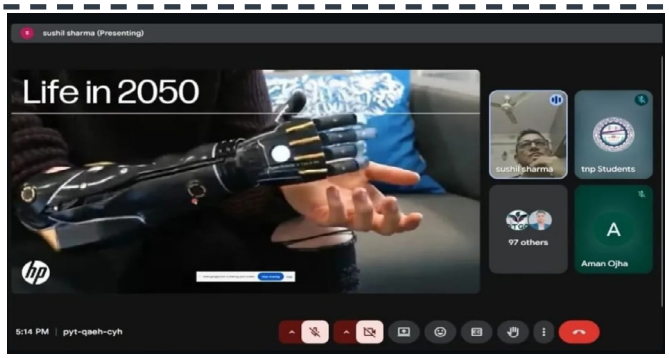
JUNE 04 A panel discussion on the theme **"Virasat se Vikas: Yog ki Bhoomika"** was conducted by **NSS, MMMUT, Gorakhpur** as part of the Social Internship and International Yoga Day celebrations. Held in online mode on **June 4, 2025**, the session highlighted the relevance of yoga in today's world.

JUNE 05 **IEEE** commemorated World Environment Day on **June 5, 2025**, with the theme **"Putting an End to Plastic Pollution"**. The event featured keynote speaker Prof. S. N. Singh from ABV-IIITM, Gwalior, and was graced by Prof. J. P. Saini, Hon'ble Vice Chancellor of MMMUT, Gorakhpur.

JUNE 05 The **Darpan Plantation Drive** was launched by **NSS, MMMUT, Gorakhpur** to promote environmental awareness and sustainability. Inaugurated by the Hon'ble Vice-Chancellor and faculty on **June 5, 2025**, the drive witnessed enthusiastic participation and reflected the spirit of ecological responsibility and stewardship.

JUNE 07 The **Training and Placement Cell** facilitated student participation in **HackVega**, a national-level virtual hackathon held from **June 7, 2025** to **June 15, 2025**. The three-round event tested aptitude, technical skills, and domain knowledge, offering cash prizes worth Rs. 1,75,000. Winners were to be felicitated at Momentum '25, an industry-academia meet.

JUNE 16 The **Training and Placement Cell** launched its **Alum Speaks** series with an online session on **June 16, 2025**, featuring Er. Sushil Sharma (2002 batch), R&D Manager at HP Inc. He shared valuable insights on AI/ML, Quantum Computing, and innovation. The session witnessed enthusiastic participation from students and faculty alike.



JUNE 17 A Yoga session on the theme **"Yoga for One Earth, One Health"** was conducted by **NSS, MMMUT, Gorakhpur** to highlight the vital role of yoga in promoting holistic well-being. Held on **June 17, 2025**, the session featured an insightful panel discussion led by Dr. Binayak Kumar Dubey on the scientific research behind yoga, in the presence of several dignitaries who added grace and significance to the occasion.

JUNE 20 The **NSS, MMMUT, Gorakhpur** organized **Yogishvara '25** from **June 20, 2025** to **June 25, 2025** as part of the NSS Social Internship, inviting students to submit short video entries on yoga asanas. The initiative aimed to spread awareness about yoga's role in promoting physical and mental well-being. The activity witnessed enthusiastic participation, reflecting students' growing interest in holistic wellness.

JUNE 21 **MMMUT, Gorakhpur** actively celebrated International Yoga Day on **June 21, 2025**, under the inspiring theme **"Yoga for One Earth, One Health"**. Faculty, students, and staff came together in unity to promote holistic well-being through guided yoga sessions that embraced physical fitness, mental clarity, and inner peace, reinforcing the timeless value of yoga in daily life.

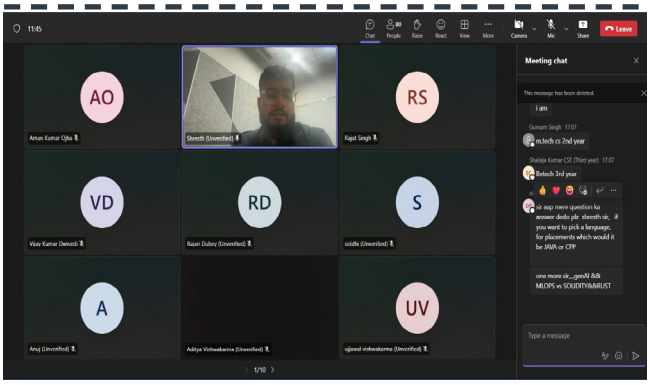
JUNE 21 **MMMUT, Gorakhpur** announced the upcoming establishment of a **Happiness and Human Assessment Lab** on **June 21, 2025**, as a step toward fostering a healthier and more mindful campus environment. Aimed at promoting holistic well-being, the initiative will support personal growth and community development, reinforcing the University's commitment to mental health and emotional wellness.

छात्रों का आत्मविश्वास बढ़ा चेहरे की मुस्कान लौटाएगा एमएमयूटी

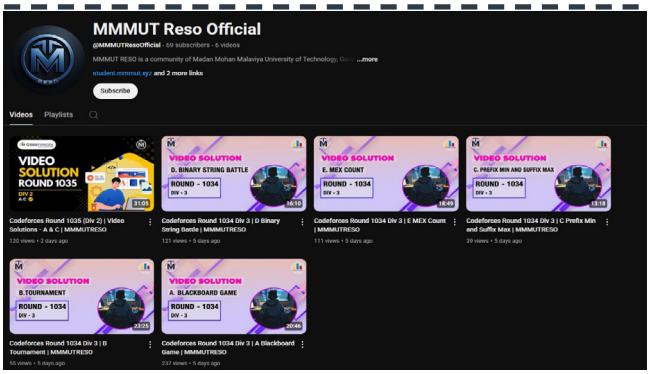
विश्वविद्यालय में होने जा रही हैप्पीनेस व ह्यूमन एसेसमेंट लैब की स्थापना बीटेक के प्रथम व तृतीय वर्ष के छात्रों के तनाव पर रहेगी नजर

हैप्पीनेस लैब में होगी यह सुविधा

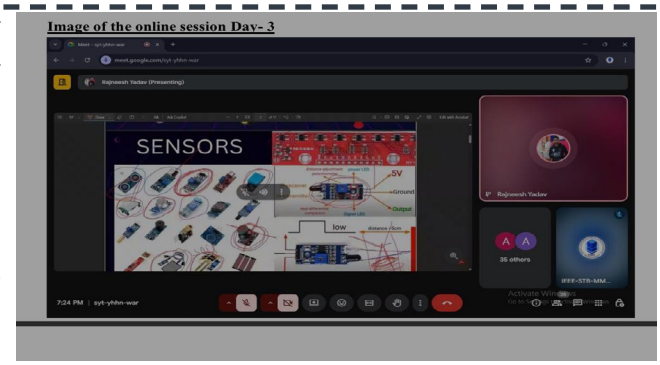
JUNE 25 The **Training and Placement Cell** organized 2nd session of the **Alum Speaks** series in online mode on **June 25, 2025**, featuring Er. Shresth Sahai (2021 batch), SDE-2 at Salesforce. He discussed the evolving tech landscape, AI's role, and key placement strategies. The session saw strong student engagement and was attended by Prof. V. K. Dwivedi, Prof. Pallav Gupta, and Ms. Sukanya Pandey.



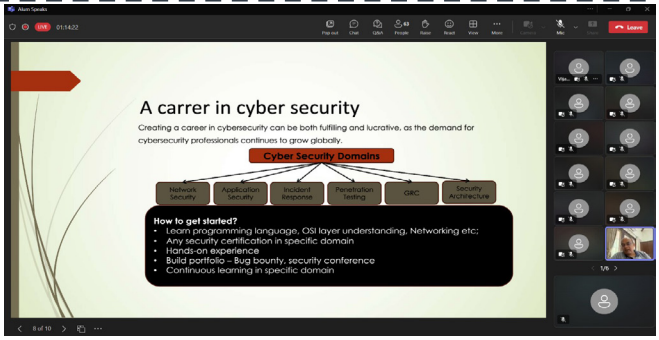
JULY 03 **MMMUT Resources** launched its official YouTube channel - 'MMMUT Reso Official' on **July 3, 2025**. The first video series is dedicated to providing students with solutions to coding contests held on Codeforces. The initiative aims to help students enhance their problem-solving skills and stay prepared for competitive programming challenges.



JULY 03 **IEEE** organized **Technovate '25**, a 3-day workshop held from **July 3, 2025** to **July 5, 2025**, merging creativity, technology, and innovation. It featured hands-on sessions in graphic designing, video editing, ReactJS for web development, and an introduction to robotics, automation, and embedded systems, offering students practical exposure to emerging technologies.



JULY 05 The **Training and Placement Cell** conducted the 3rd session of its **Alum Speaks** series on **July 5, 2025**, via Microsoft Teams. Mr. Arvind Gupta, Business Information Security Officer at SAP, delivered an insightful talk on **"Core Elements of Cyber Security and Career Opportunities"**, highlighting key domains and career prospects in the field.



Beyond Ballistics

From deep algorithms to speeds beyond the sound, innovation's pulse reshapes the world.

The landscape of modern military affairs is being radically reshaped by the powerful convergence of cutting-edge technology, shifting geopolitical dynamics, and rapidly evolving security doctrines. Warfare today extends far beyond conventional battlefields, unfolding across cyber networks, outer space, and the invisible realm of information dominance. Military power is no longer measured solely by the size of armies or nuclear stockpiles, it is increasingly defined by speed, precision, and technological superiority. Within this rapidly shifting landscape, hypersonic missiles have emerged as one of the most disruptive advancements of our time. Traveling at speeds exceeding Mach 5 and capable of unpredictable maneuvering, these weapons are rewriting the rules of engagement. As nations race to develop hypersonic capabilities, global security enters uncharted territory, where reaction time shrinks to seconds and traditional defense systems struggle to keep pace. To illustrate, a missile flying at Mach 10 can cover nearly 3 kilometers per second, drastically reducing decision-making time for defenders.

The development of hypersonic missiles is the result of decades of scientific pursuit and strategic necessity. For years, ballistic missiles served as the backbone of deterrence, delivering payloads over long distances by following high, predictable arcs. However, as radar, missile defense systems, and space-based surveillance improved, these traditional projectiles became more vulnerable. Hypersonic missiles counter this by flying within the atmosphere at extreme speeds, along unpredictable trajectories that make them far more elusive. Their combination of velocity, precision, and maneuverability represents a leap that challenges current defense architectures and reshapes military power balances.

At their technical core, hypersonic missiles rely on two primary mechanisms:

Hypersonic Glide Vehicles (HGVs) and Hypersonic Cruise Missiles (HCMs). HGVs are launched by rockets to high altitudes, then detach and glide through the atmosphere at immense speeds. Their maneuverability is enabled by aerodynamic surfaces, allowing them to follow erratic paths that confound tracking systems. This flight unpredictability prevents defenders from accurately predicting impact points. HCMs, on the other hand, are atmospheric weapons powered by scramjet (supersonic combustion ramjet) engines. Unlike conventional jet engines that decelerate incoming air before combustion, scramjets efficiently compress and burn supersonic air in real time, enabling sustained hypersonic flight well beyond Mach 5.

The engineering challenges involved are formidable. Designing an engine that can ignite and maintain combustion in a rapidly moving airstream is a major feat. Navigation systems also face hurdles, while HGVs and HCMs rely on inertial navigation systems (INS) augmented by GPS or terrain-following radar, extreme speeds can disrupt standard GPS reception, demanding sophisticated signal processing or alternative methods. Moreover, hypersonic speeds generate intense heat, requiring cutting-edge thermal management and advanced materials like ceramic matrix composites and nickel-based superalloys to prevent structural failure.

Despite these achievements, hypersonic missile development comes with significant limitations. The extreme conditions during flight-heat, pressure, and stress require advanced materials science and engineering solutions. Building reliable and possibly reusable systems remains costly and complex. Guidance and control also pose challenges; at such high speeds, minor deviations can result in significant targeting errors, especially in precision-strike scenarios. Geopolitically, the ability to strike within minutes reduces response time for leaders, heightening risks of misjudgment or

DRDO Hypersonic Glide Missile

Scramjet Engine

escalation. The persistent ambiguity over a missile's payload, whether nuclear or conventional, further complicates accurate threat assessment, especially in volatile, high-tension environments.

Unsurprisingly, the race to master hypersonic technology has intensified. Possessing these weapons offers not only tactical superiority but also strategic leverage. Russia has already deployed operational systems like the Avangard HGV and the Kinzhal air-launched missile, demonstrating their use in conflict. China has advanced rapidly with its DF-17, equipped with a hypersonic glide vehicle designed to maneuver at high speed and avoid interception. Meanwhile, the United States is accelerating its own programs, such as the Hypersonic Air-breathing Weapon Concept (HAWC) and the Long-Range Hypersonic Weapon (LRHW). Nations like India, France, Australia, and Japan are also investing heavily in hypersonic R&D, recognizing these systems as a cornerstone of future defense.

The pursuit of hypersonic technology marks a pivotal shift in the evolution of warfare, ushering in an era defined by speed and strategic complexity. As countries devote immense resources to mastering these capabilities, the importance of international dialogue and arms control becomes increasingly urgent. The profound implications for global stability and deterrence theory demand a measured, collective response to ensure these powerful tools serve as safeguards against aggression-not accelerants of conflict. The future of international security will depend on how the global community manages the rise of the hypersonic age.

Blue Gold Wars

"Water may lack the shimmer of oil, but its absence will leave a darker stain on humanity."

Water, once the unassailable right of every human being, has now transformed into the centrepiece of an impending global conflict. What was once an indispensable yet often overlooked element of daily life has become an increasingly scarce luxury, the liquid lifeline over which nations may soon compete for survival itself. In the shadow of fossil fuel disputes and the race for rare earth metals, a quieter yet potentially more devastating crisis is unfolding: the global water crisis. As populations surge, climate change intensifies, and industrial demands escalate, freshwater is rapidly emerging as one of the most critical and fiercely contested resources of the 21st century. From the dried-up rivers of the American West to the parched plains of sub-Saharan Africa and the simmering diplomatic tensions over the Nile, this liquid asset has evolved from a basic necessity into a catalyst for geopolitical conflict.

Violence over this blue gold has a deep historical footprint. The first recorded water war occurred nearly 4,500 years ago between the ancient city-states of Umma and Lagash in Mesopotamia, battling over irrigation rights from the Tigris River. The Middle East, long a hotspot for resource competition, has seen a sharp uptick in water-driven violence. In 2023, Israeli strikes on Palestinian infrastructure in the West Bank and Gaza, particularly those targeting essential water systems, accounted for nearly 25% of all global incidents of resource-related violence. Such acts of environmental oppression deepen humanitarian crises and transform essential resources into instruments of control. In South Asia, India's suspension of the Indus Waters Treaty following a deadly militant attack sparked fears of hydro-political conflict with Pakistan, a stark reminder of how vital resources can strain even the most enduring agreements.

At the core of these rising tensions lies climate change. Increasing temperatures and shifting rainfall patterns are drying up rivers, depleting reservoirs, and destabilizing natural water systems. Vulnerable communities are collapsing

under the weight of failed water infrastructure, displacing families and fuelling climate migration. Melting glaciers, prolonged droughts, and erratic monsoons have already reduced freshwater availability. In cities like Cape Town, South Africa, and Chennai, India, 'Day Zero', the day when taps run dry is no longer hypothetical. It's a lived reality. In India, farmers have rioted over drought-induced scarcity and the diversion of water to urban centres. In sub-Saharan Africa, traditional herders clash with farmers over increasingly limited water and arable land. Meanwhile, arid regions in the Middle East and North Africa now rely heavily on desalination and cross-border water purchases.

The water crisis is, in essence, a climate crisis, and the two fuel each other in a destructive loop. Despite the grim trajectory, international law does provide protections. The United Nations declared access to this vital element a human right in 2010, and humanitarian law forbids attacks on civilian water infrastructure or its use as a weapon of war. Yet the escalation continues. Today, over 4 billion people live in river basins that cross political borders, and more than half of the world's 310 international river basins lack formal sharing agreements or joint commissions. We urgently need diplomatic interventions to mediate water-sharing and reduce transboundary tensions. Equally, we must scale efforts to mitigate climate disruptions that amplify water stress. Another pressing development is the financialization of water. In 2020, the Chicago Mercantile Exchange introduced futures trading on California water, the first instance of water entering the global commodities market. Advocates claim this promotes efficiency, but critics argue it risks commodifying a human right. Corporations are already investing heavily in water assets by purchasing aquifers, utilities, and distribution systems, a trend that further marginalizes vulnerable populations.

Yet history also provides hope. Though often a source of conflict, this essential resource can also serve as a foundation for cooperation.

River of Dust: The Vanishing Lifeline

Water as Weapon: Guarding the Lifeline in a Warzone

Despite multiple wars, the Indus Waters Treaty between India and Pakistan has largely held since 1960. In Central Asia, once-divided nations are now engaging in cooperative management of the Amu Darya and Syr Darya rivers. International frameworks like the UN Watercourses Convention and Helsinki Rules emphasize the principles of "equitable and reasonable use" of transboundary water resources, frameworks that need broader adoption and enforcement. As water security grows more precarious, technological innovation offers promising solutions. Smart irrigation, aquifer satellite monitoring, and wastewater recycling can drastically improve water use. Israel, with minimal freshwater resources, recycles nearly 90% of its wastewater and leads in drip irrigation to maximize agricultural efficiency. Singapore's NEWater project converts treated sewage into potable water, bolstering national resilience. Even atmospheric water generators, which extract moisture from air, are being deployed in arid zones. But innovation is not enough. These technologies require infrastructure, investment, and critically, political will, which is often lacking in the most water-stressed regions. As we move deeper into the 21st century, access to water may determine the trajectory of peace, development, and survival more than any other resource. Will we see a world of water wars and environmental refugees, or one where innovation and diplomacy quench the thirst of billions? The answer lies in the choices made today - in how we price, conserve, and share water. Ignoring the water crisis is no longer an option. Like air, water is a right, but if mismanaged, it may well become the reason nations clash. It may lack the flash of oil or the tech-world allure of lithium, but water has unequivocally emerged as the blue gold of our era. The question is no longer if the next water conflict will unfold, but when, and whether humanity will rise with the wisdom to avert it.

TECH inSights

Mail your answers at literaryedb@mmmut.ac.in

```
public class BitwisePuzzle {
   public static void main(String[] args) {
      int x = 128;
      int y = x >> 1;
      int z = y ^ 0;

      char[] result = new char[7];

      result[0] = (char) ((z | 16) + (4 | 2));
      result[1] = (char) (z | 1);
      result[2] = (char) ((z | 4) + (2 | 1));
      result[3] = (char) ((z | 8) + (4 | 1));
      result[4] = (char) ((z | 8) + (1 << 0));
      result[5] = (char) ((z | 16) + (2 << 1));
      result[6] = (char) (z | 1);

      System.out.println(new String(result));
   }
}
```

What is the output of above Java program?

COMPUTER SCIENCE AND ENGINEERING

The postorder traversal of a binary tree is 8,9,6,7,4,5,2,3,1. The inorder traversal of the same tree is 8,6,9,4,7,2,5,1,3. The height of a tree is the length of the longest path from the root to any leaf. What is the height of the binary tree?

INFORMATION TECHNOLOGY

Consider a four-bit digital-to-analog converter (DAC) used in an electronic circuit. The analog values corresponding to digital inputs 0000 and 0001 are 0V and 0.0625V respectively. What will be the analog output (in volts) for the digital signal 1111?

ELECTRONICS AND COMMUNICATION ENGINEERING

A gas stream with 30% CO_2 and 70% air flows at 2 m^3/min, 1 atm, and 300 K. It is scrubbed with a NaOH solution. If 80% of the CO_2 is removed, calculate the overall mass transfer rate.

CHEMICAL ENGINEERING

An unknown resistance is measured using the substitution method. First, a standard 100-ohm resistor is connected in series with a rheostat and a galvanometer. The battery voltage is 10V, rheostat setting is 500 ohms, and galvanometer deflection is 60°. Later, the battery voltage drops to 9V, and when the unknown resistance replaces the known one, the galvanometer again shows 60° deflection with the same rheostat setting. What is the value of the unknown resistance?

ELECTRICAL ENGINEERING

A tank is filled with water and has a small orifice at its bottom. If the height of water above the orifice is initially 4 meters, estimate how long it will take to empty half the volume of water from the tank. Assume the tank has a constant cross-sectional area and neglect any energy losses.

MECHANICAL ENGINEERING

A tall tank filled with water up to 1.2 m has a small hole of diameter 1.5 cm at its base. Assuming the tank's area is much larger than the hole (so surface velocity is negligible), with $C_d = 0.6$ and $g = 9.81$ m/s^2, calculate the total time (in seconds) required to empty the tank completely through the hole.

CIVIL ENGINEERING

Winner of the Tech inSights of Tiresia Volume 16, Issue 2 is Ashish Kumar Yadav, B. Tech 2nd Year, CSE. Rest of the answers were either late or unsatisfactory.

Cosmovista

The Silent Erosion

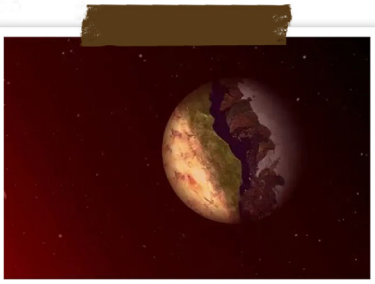
In the dark tapestry of space, even light can wear away. Around massive black holes, photon spheres trap beams of light in orbits so tight, they shimmer on the edge of forever. But nothing lasts. Slowly, relentlessly, even this light spirals inward, vanishing into silence. It's not destruction, but a quiet surrender to gravity's endless pull, a fading glow in the ultimate eraser of time.

~Pranav Mishra, IT 2nd year

The Cosmic Web

Zoom far enough out and the universe resembles a glowing web filament of galaxies stretching across the void, bound together by invisible threads of dark energy and matter. Between these threads lie deep voids, ancient and quiet. This grand structure, born from quantum ripples after the Big Bang, is the blueprint of everything. It is an unseen architecture written in stardust and gravity.

~Aditi Sharma, ECE 2nd year



Tidally Locked

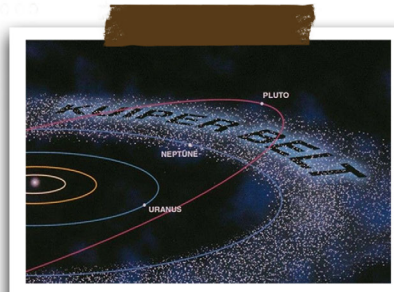
Some worlds never see the dawn. Orbiting too close to their stars, they are tidally locked - one side scorched in eternal day, the other frozen in endless night. On the twilight line between the two, winds scream and chemistry dances in strange balance. These alien realms, split between fire and ice, remind us that not all planets spin in rhythm with time.

~Divyansh Singh Rathore, ECE 2nd year

Cradle of Moons

Beyond Neptune, in the icy realms of the Kuiper Belt, countless frozen bodies orbit the Sun. Among them, new moons are believed to be born; sculpted from ancient collisions and gentle gravitational pulls. These distant cradles of rock and ice remind us that even at the edge of the solar system, creation continues in quiet, beautiful ways.

~Gaurav Vishwakarma, ECE 2nd year



We invite all students to unveil the cosmic phenomena that captivate their imagination. Draft a concise description of the event and submit it to literaryedb@mmmut.ac.in. The most compelling entries will be published in the next issue of Tiresia.

उत्सर्ग

> स्वहित-तृप्तत ववमुक्त कर, परहित पथ में दृढ़ जो चलता।
> वही उत्सर्ग तत्व है, जो मौन यज्ञ-दीप-सा जलता।।

उत्सर्ग मात्र त्याग का सूचक नहीं, अपितु यह चेतना की उस अवस्था का बोधक है जहाँ व्यक्ति अपने 'स्व' से ऊपर उठकर 'समष्टि' की अभ्युदय हेतु स्वयं का सम्पूर्ण अर्पण करता है। यह आत्मबोध से जन्मी वह जीवनवृत्ति है, जिसमें कर्म, भाव एवं संकल्प तीनों का संलयन, परार्थ भावना से प्रेरित हो, संपूर्णता की ओर उन्मुख होता है। उत्सर्ग न तो कर्तव्यबद्ध त्याग है, न ही वैराग्यजन्य निवृत्ति, यह तो वह संकल्प है, जहाँ स्वयं को अर्पित कर देना ही परम अर्थ बन जाता है।

कठोपनिषद् का उद्घोष, "त्यागेनैके अमृतत्वमानशुः", अर्थात् केवल त्याग के माध्यम से ही कुछ महान आत्माएँ अमरत्व को प्राप्त हुई हैं, इसी अर्पण की परम महिमा का उद्घाटन करता है। न्यास यद्यपि बाह्य रूप में किसी वस्तु, कर्म या सुविधा के परित्याग के रूप में दृष्टिगोचर होता है, परन्तु इसका वास्तविक स्वरूप अंतरात्मा के गहन समर्पण तथा आंतरिक शुद्धि में निहित होता है, जो अपने अहं, अपनी इच्छाओं, वासनाओं, सीमाओं एवं स्वार्थपरता के निराकरण से प्रकट होता है।

बलिदान और उत्सर्ग में एक सूक्ष्म किन्तु महत्त्वपूर्ण भेद निहित है। बलिदान सामान्यतः परिस्थितिजन्य होता है; एक क्षणिक, किन्तु प्रबल त्याग जो किसी विशेष उद्देश्य की पूर्ति हेतु, अक्सर संकट अथवा वेदना की स्थिति में किया जाता है। इसके विपरीत, उत्सर्ग का भाव केवल किसी प्रतिक्रिया तक सीमित नहीं रहता, अपितु दीर्घकालिक जीवन-दृष्टि के रूप में प्रकट होता है। वह शांत, सहज और निरंतर प्रवाह की भाँति सम्पूर्ण अस्तित्व को समर्पित करने की वृत्ति बन जाता है। बलिदान में त्याग का केंद्र कर्म हो सकता है, किन्तु इस उच्चतर समर्पण में त्याग का केंद्र स्वयं 'अहं' होता है। यह अंतर इसे बलिदान से विशिष्ट बनाता है। जब यह आन्तरिक परिवर्तन पूर्ण होता है, तब आत्मा में समर्पण का दिव्य आलोक प्रज्वलित होता है तथा व्यक्ति अपने जीवन को किसी उच्चतम उद्देश्य के लिए समर्पित कर देता है। यही आत्मदान की पराकाष्ठा उस अवस्था को जन्म देती है, जिसे हम 'उत्सर्ग' कहते हैं।

उत्सर्ग आत्मा की उस परिपक्व अवस्था का नाम है, जो भीतर से उदात्तता को स्वीकारती है। जब व्यक्ति अपनी सीमाओं, आग्रहों एवं मोह के बंधनों को त्यागकर व्यापक हित में अपने आप को समर्पित कर देता है, तभी वह वास्तविक रूप से 'मानव' कहलाने योग्य होता है। उत्सर्ग उस बोध का सृजन करता है जहाँ हम अपने अस्तित्व को किसी महान उद्देश्य में लीन कर देते हैं। यह अस्तित्व की

लघुता से ब्रह्म की व्यापकता की ओर यात्रा है।

उत्सर्ग का प्रभाव केवल आत्मा की शुद्धि तक सीमित नहीं रहता, अपितु यह समाज, राष्ट्र एवं समग्र सृष्टि के लिए दिव्य ऊर्जा का संचार करता है। जब व्यक्ति उत्सर्गमय होता है, तब उसके कर्म, उसके विचार, उसके संबंध सभी पवित्र हो जाते हैं। वह अपनी उपस्थिति मात्र से सौंदर्य, करुणा एवं पवित्रता का स्रोत बन जाता है। यही कारण है कि संतों तथा महापुरुषों का जीवन एक प्रेरणा बनता है क्योंकि उन्होंने अपने अहं को मिटा, समाज के लिए अपना सर्वस्व अर्पित कर दिया।

प्रकृति स्वयं इस उत्सर्ग का जीवंत उदाहरण है। सूर्य निरन्तर अपनी ऊर्जा का समर्पण करता है, नदियाँ स्वयं को निःशेष बहा देती हैं, वृक्ष-फल, फूल एवं छाया बिना किसी आशा के प्रदान करते हैं, यह सारा तंत्र उत्सर्ग का ही प्रतिफल है। प्रकृति का प्रत्येक घटक अपनी सत्ता का अतिक्रमण कर समष्टिगत् कल्याण हेतु जीवंत समर्पण करता है। यदि प्रकृति यह कर सकती है, तो मानव के लिए यह उसकी चेतना के उत्कर्ष का पथ बन सकता है।

आध्यात्मिक दृष्टिकोण से देखें तो उत्सर्ग 'अहम्' की समाप्ति तथा 'तत्त्वमसि' की अनुभूति है। यह जीव तथा ब्रह्म के भेद को विलीन कर, चेतना को अद्वैत स्थिति में प्रतिष्ठित करता है। यही कारण है कि संत-साहित्य, योगशास्त्र, गीता एवं उपनिषदों जैसे ग्रंथों में उत्सर्ग को साधना का मूलाधार माना गया है। ईशावास्योपनिषद् का यह उद्घोष, जो जीवन के मूल दृष्टिकोण को स्थापित करता है:

"ईशावास्यमिदं सर्वं यत्किञ्च जगत्यां जगत्।
तेन त्यक्तेन भुञ्जीथा मा गृधः कस्यस्विद्धनम्॥"

अर्थात् समस्त जगत में ईश्वर ही व्याप्त है, अतः त्याग भाव से व्यवहार करो और लोभ का परित्याग करो। यह त्याग केवल वस्तुओं का नहीं, बल्कि 'स्वत्व' के अहं का भी है। उत्सर्ग उसी भाव की चरम परिणति है, जहाँ कोई इच्छा शेष नहीं रहती, केवल समर्पण ही शेष रह जाता है। जीवन में यह उस चेतन अवस्था की ओर ले जाता है जहाँ व्यक्ति कर्ता नहीं, यज्ञकर्ता बनता है। यज्ञ में हवन सामग्री की आहुति की भाँति, वह अपनी इच्छाओं, समय, ऊर्जा एवं जीवन को उच्चतर मंगल हेतु समर्पित करता है। यह समर्पण न किसी दबाव से उत्पन्न होता है एवं न किसी पुरस्कार की अभिलाषा से। यह सहज होता है, अंतःप्रेरित होता है, तथा आत्मस्फूर्त होता है। यह वह सूक्ष्म आन्तरिक ज्वाला है जो चेतना को परिमित से अपार की ओर प्रवाहित करती है।

अतः निष्कर्ष रूप में कहा जा सकता है कि उत्सर्ग न केवल आध्यात्मिक पूर्णता की सीढ़ी है, अपितु व्यावहारिक जीवन में भी एक ऐसा आलंबन है जो व्यक्ति को कल्याणकारी बनाता है। यह केवल व्रत, तप या साधना की विधा नहीं, अपितु जीवन की शैली है जो आत्मा को आकाशवत् विस्तार देती है। उत्सर्ग ही वह अमृततत्त्व है जो जीवन को दिव्यता, समाज को समरसता तथा आत्मा को परमशांति प्रदान करता है। जो जीवन उत्सर्गमय है, वही जीवन पूजनीय है, और वही आत्मा ब्रह्मत्व की अधिकारी होती है, क्योंकि वही परम सत्य से एकत्व को प्राप्त करती है।

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Gorakhpur (U.P.) India

Established by U.P. Act No. 22 of 2013 of U. P. Government

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