



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA



**THE**

OFFICIAL BULLETIN OF THE FACULTY OF MECHANICAL ENGINEERING

# MECHANICA

FEBRUARY 2026

## CELEBRATE 2025

This first edition of *Mechanica* celebrates the remarkable achievements, breakthroughs, and community moments from 2025 – a year of innovation, industry engagement, student excellence, and research impact.

## RIMAU-1

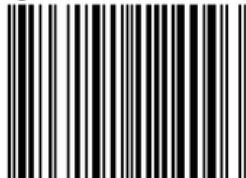
RIMAU-1 UTM conquers the Texas Skies - Malaysia's first representative at IREC

## GOLD MEDAL AT EUFIRE '25, UOW

The sole representative from FKM made history by winning the Gold Medal and the Best Booth Award at the Engineering Research Symposium (EuRES) & International Fusion Invention Research Exhibition Competition (i-FIRE)

VOLUME 01/2026

eISSN 3141-124X



9 773141 124003

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First Edition 2026  
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81310 Johor Bahru, Johor  
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## **The Mechanica**

The Official Biannual Bulletin of the Faculty of Mechanical  
Engineering, UTM

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BOLD . PROMPT . PERSISTENT

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# EDITOR'S DESK



**Prof. Ir. Ts. Dr. Zaini bin Ahmad**

**PATRON**

Dean of the Faculty of Mechanical Engineering

It is my pleasure to introduce the inaugural edition of THE MECHANICA, the official bulletin of the Faculty of Mechanical Engineering (FKM), Universiti Teknologi Malaysia. This bulletin highlights the achievements, innovations, and activities of our faculty.

The year 2025 has been a significant one for FKM, marked by notable accomplishments in research, innovation, academic excellence, and industry collaboration. From international competition wins and research breakthroughs to partnerships with industry, these achievements show our staff, researchers, and students are dedicated to advancing engineering knowledge and solutions that benefit society.

The MECHANICA captures these milestones and shares them with our wider community, celebrating the people and ideas that keep the faculty moving forward. It also reflects our commitment to supporting UTM's ASCEND 2030 vision, strengthening research impact, nurturing future engineers, and contributing to national and global technological advancement.

I want to express my sincere appreciation to everyone who contributed to this first issue and to all members of the FKM community for their continuous efforts in shaping the future of engineering. I hope you enjoy reading this inaugural edition of THE MECHANICA.



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THE MECHANICA is the official bulletin of the Faculty of Mechanical Engineering (FKM), Universiti Teknologi Malaysia, created to highlight the faculty's vibrant achievements, innovations, and activities. This publication showcases the dedication of our researchers, staff, and students in advancing engineering knowledge, technological innovation, and meaningful industry collaboration.

Through stories of research breakthroughs, academic initiatives, student successes, and global partnerships, THE MECHANICA reflects the dynamic ecosystem that drives FKM forward. As we continue to strengthen our impact in line with the UTM ASCEND 2030 vision, this bulletin serves as a platform to celebrate our people, share our ideas, and inspire future engineering excellence.

# RIMAU-1 UTM CONQUERS THE TEXAS SKIES, MALAYSIA'S FIRST REPRESENTATIVE AT IREC

*Written By Ahmad Arfan Azhari  
Edited by Nuratiqah Imani binti Noordin*



A team of students from Universiti Teknologi Malaysia (UTM) made history by successfully launching their homemade rocket, RIMAU-1, at the International Rocket Engineering Competition (IREC) 2025 in Midland, Texas, USA. The achievement marks a major milestone, making UTM the first Malaysian team to qualify for the finals of this prestigious competition, organized by the Tripoli Rocketry Association and held over six days until 14 June.

The UTM Rocketry Team is led by final-year Mechanical Engineering student T.K. Arykummara, alongside team members Brenden Huang, Hong Quan, K. Raahull, Izzat Idlan Amir Raslan, and S.N. Shivee Prakkaash, representing students from both the Faculty of Mechanical Engineering and the Faculty of Electrical Engineering.

Standing 2.8 meters tall and weighing 28 kilograms, RIMAU-1 was built from fibreglass and carbon fibre and designed to reach an altitude of 3,000 meters, in accordance with competition requirements.

The rocket was fully hand-built over nine months by a larger team of 40 students from various technical disciplines. The team conducted early testing beginning in January, followed by intensive construction in March, and developed their own parachute recovery system to ensure a safe landing.

The project cost approximately RM40,000, while the total budget, including travel and logistics, reached RM200,000, supported by the Faculty of Mechanical Engineering, JTNCHPEA, UTM International, and other contributors.

The IREC 2025 competition brings together more than 7,000 students from 172 universities worldwide, with only 176 teams qualifying for the final round. UTM's participation places Malaysia among leading global institutions in aerospace engineering, highlighting the capability of Malaysian students to compete on the international stage.



# FKM'S SOLE REPRESENTATIVE WINS GOLD MEDAL AT EUFIRE '25, UOW

Written By Dr Mohd Haziq Dzulrifli  
Edited by Nuratiqah Imani binti Noordin

The sole representative from the Faculty of Mechanical Engineering (FKM) made history by winning the Gold Medal and the Best Booth Award at the Engineering Research Symposium (EuRES) & International Fusion Invention Research Exhibition Competition (i-FIRE), held at the University of Wollongong Malaysia (UOW), Shah Alam.

Azam Fahmi Ahmad Fazli, Muhammad Faris Muhammad Anas, Muhammad Hafizuddin Mustapa, and Muhd Isyaff Ihsan Azahari—all Year 2 students of Mechanical Engineering with Honours—presented their research project titled “BaraX: Eco-Friendly and Sustainable Fire-Retardant Paint” in the competition, which featured nearly 50 entries from more than 10 primary and secondary schools, as well as local and international higher-learning institutions. The four FKM students were guided and accompanied by their group advisor, Dr Mohd Haziq Dzulrifli, Senior Lecturer at FKM, UTM.

Previously, Azam Fahmi, Muhammad Faris, and Muhammad Hafizuddin had already made a name for themselves as FKM and UTM's sole representatives at another international innovation competition, the International Undergraduate Innovation Competition 2025 (IUIC'25), held on 28-30 October at Universiti Tun Hussein Onn Malaysia (UTHM), Batu Pahat, where they secured a silver medal. Their success in that competition motivated them to improve their project further and aim for a gold medal in their next research competition.



“We improved our research outcomes in several aspects based on suggestions and comments received from the previous competition,” said Muhammad Hafiz when asked about the differences this time around. “According to Azam Fahmi, they were better prepared for the presentation phase this time after receiving guidance from their advisor, Dr. Mohd Haziq Dzulrifli. “Even though the judges’ questions were more challenging this round, we felt calm and confident thanks to the experience we gained from IUIC'25,” he added.

EuFIRE'25 is an annual global event organized by the Faculty of Civil Engineering (FKA), UTM, serving as a platform for researchers, industry professionals, academics, and inventors to showcase their latest work—aligned with this year's theme, “Connecting Minds for a Sustainable Future.” For 2025, EuFIRE was held on 27 November, with EuRES and i-FIRE being the 7th and 3rd editions, respectively. The opening ceremony was officiated by Prof. Dr. Hew Pang Leang, Vice Chancellor of the University of Wollongong Malaysia.



# MiDEX 2025

## Strengthens Industry-Academia Collaboration at UTM

Written & Edited by Ts ChM Dr Nor Suriani Sani

For more details, visit the official news at:  
<https://news.utm.my/2025/05/midex-2025-perkasa-kolaborasi-utm-industri-perluas-peluang-graduan/>

The Faculty of Mechanical Engineering (FKM), Universiti Teknologi Malaysia (UTM), successfully hosted the Mechanical Industrial Day and Exhibition 2025 (MiDEX 2025) on 26-27 May 2025 at UTM Skudai. The two-day event brought together students, industry partners, alumni, schools, and the local community in a vibrant celebration of engineering innovation, collaboration, and talent development.

Recognized under UTM's AIM4Star Programme, MiDEX 2025 is one of the university's flagship initiatives that strengthen academic-industry collaboration while fostering meaningful engagement with society. More than 34 companies and agencies participated in the event, offering career talks, job interviews, and technology showcases. With over 1,000 visitors attending, the campus was transformed into an energetic platform where knowledge exchange, innovation, and career opportunities intersected.

Students from FKM showcased their final-year projects, research posters, and industrial training experiences, providing industry representatives with insights into emerging engineering talent. At the same time, companies shared their expectations for future engineers, helping students better understand real industry needs.

A key highlight of MiDEX 2025 was the Memorandum of Understanding (MoU) signed between FKM-UTM, TWI Technology (S.E. Asia) Sdn. Bhd., and Welding Institute Malaysia ANB, enabling UTM to become the only university in Malaysia authorised to offer the International Welding Engineer (IWE) Diploma programme. The collaboration also supported lecturer training and student certification programmes through significant industry and government contributions.

MiDEX 2025 also featured a wide range of engaging activities, including STEM competitions, sustainability showcases, and cultural exhibitions. Together, these initiatives highlighted UTM's commitment to nurturing innovative engineers while strengthening partnerships that support a more sustainable and technologically advanced future.



# TECHNOLOGY TRANSFER APPRENTICESHIP PROGRAMME (TTAP) NURTURES MALAYSIAN MOTORSPORT ENGINEERING TALENT

Written by Ir. Dr. Mohd Azman Abas  
Edited by Ts ChM Dr Nor Suriani Sani



The Technology Transfer Apprenticeship Programme (TTAP), an initiative led by Persona Energy Sdn. Bhd., in collaboration with Porsche Motorsport Asia Pacific (PMAP), continues to demonstrate how industry-driven training can nurture highly skilled engineering talents for the motorsport and automotive sectors. The programme marked another important milestone in strengthening Malaysia's presence in the international motorsport ecosystem through structured technical exposure and hands-on learning.

TTAP is designed to bridge the gap between academic knowledge and the demanding realities of motorsport engineering. Through this initiative, selected Malaysian engineering students get hands-on experience with real-world motorsport operations, learning practical insights into high-performance vehicle systems, race team management, and technical problem-solving under competitive conditions, with experienced professionals, including international racing driver Jazeman Jaafar as mentor and Ir. Dr. Mohd Azman Abas, as Programme Academic Advisor, supports the programme.

Six students of FKM, UTM were selected to participate in the programme and were embedded directly within the Porsche Carrera Cup Asia Championship. Over six months, the apprentices worked closely with professional racing teams, assisting in tasks such as car setup, mechanical inspections, tyre management, and race preparation for the Porsche 911 GT3 Cup race car. Training activities and race events took place across major motorsport venues in Asia, including Buriram in Thailand, Sepang in Malaysia, and Shanghai in China.

Beyond technical training, TTAP emphasizes discipline, teamwork, and adaptability within the high-pressure environment of international racing. Continuous performance assessments enable mentors to identify strengths and areas for improvement as they prepare participants for professional careers in the motorsport industry.

The programme has already produced encouraging outcomes, with several participants receiving opportunities with international racing teams. Through initiatives like TTAP, Malaysia is building a new generation of engineers with advanced technical skills, global industry exposure, and the confidence to compete in motorsport engineering.

# STRUCTURAL INTEGRITY FAILURE 2025

## Bridging Industry and Academia

Written & Edited by Ts ChM Dr Nor Suriani Sani



For more details, visit the official news at:  
<https://news.utm.my/2025/07/structural-integrity-2025-highlights-industry-academia-collaboration-in-tackling-infrastructure-challenges/>

More than 120 engineers, researchers, and industry professionals gathered at Four Points by Sheraton Desaru, Johor, for the Structural Integrity Failure 2025 Forum and Workshop, an event dedicated to addressing real-world challenges in infrastructure safety and reliability. The programme was jointly organized by the Faculty of Mechanical Engineering (FKM), Universiti Teknologi Malaysia (UTM), and the Association of Materials, Vibration & Insulation Practitioners Malaysia (AMVIP), with support from key industry partners.

Officiated by FKM Dean, Prof. Ir. Ts. Dr. Zaini Ahmad, the forum highlighted the importance of producing future-ready engineers capable of translating research into practical industrial solutions. In his remarks, he emphasized that strong collaboration between universities and industry is essential to ensure that engineering innovations address real operational needs. Echoing this sentiment, Assoc. Prof. Ir. Ts. Dr. Muhamad Azizi Mat Yajid, Deputy Dean (Research, Innovation & Development) and Chair of AMVIP Johor, noted that preventing failures in pipelines, buildings, and other critical infrastructure requires a combination of academic knowledge, technological innovation, and field expertise.



The success of the forum was further strengthened by the support of eight industry sponsors, namely Abadi Oil & Gas Services, FGE Control, InsulRef, IFOCS EngTech, Kanmeta Engineering, Norimax, PICORR, and Pluperfect Technology, which reflecting a strong shared commitment between industry and academia in advancing engineering excellence and infrastructure reliability.

For students and young researchers, the forum provided a valuable opportunity to witness how classroom theories translate into real-world engineering solutions. By bringing together academia, industry, and emerging talent, the event reinforced a shared commitment to building safer, more resilient infrastructure for Malaysia's future.

# UTM HOSTS 14TH CAMPUS ASIA PLUS EEST SUMMER SCHOOL, STRENGTHENING REGIONAL COLLABORATION

Written by Dr. Muhammad Faiz Hilmi bin Rani  
Edited by Ts ChM Dr Nor Suriani Sani

For more details, visit the official news at:

<https://news.utm.my/2025/08/utm-makes-history-hosting-14th-campus-asia-eest-summer-school/>

Universiti Teknologi Malaysia (UTM) proudly hosted the 14th CAMPUS Asia Plus (CA+) Energy, Environment, Science and Technology (EEST) Summer School on 29 August, marking a significant milestone as the first time UTM has taken the lead since joining the prestigious CAMPUS Asia Plus consortium in 2022. Held over two weeks, the programme brought together 153 delegates, comprising 73 faculty members and 80 students from four leading Asian universities: UTM (Malaysia), Kyushu University (Japan), Pusan National University (South Korea), and Shanghai Jiao Tong University (China).

Guided by the theme “4 Universities. 4 Colours. 1 Mission. Friendship · Passion · Collaboration,” the summer school reflected the spirit of unity across borders. Participants engaged in a dynamic blend of academic learning, industrial exposure, and cultural exchange, while building meaningful connections beyond language and cultural differences. The programme featured academic lectures by distinguished professors from the four partner universities, encouraging critical discussions on sustainability and technological innovation.



Students also worked in multinational teams during eight interactive laboratory sessions, culminating in research pitches that showcased innovative findings and future-focused ideas. Learning extended beyond the classroom through visits to Tanjung Piai National Park, the Southernmost Tip of Mainland Asia, Princeton Digital Group’s AI-ready Data Centre in Sedenak, and Malakoff Tanjung Bin Power Plant. These visits provided participants with valuable exposure to environmental conservation, digital infrastructure, and Malaysia’s energy sector.

A cultural tour around Johor Bahru, including the Zero Kilometer landmark, Heritage Street, and Johor Craft Complex, further enriched the experience. Another highlight was the Kyushu University Forum - KYUDAI NOW @ Johor Bahru, which strengthened academic and alumni ties between Malaysia and Japan. The success of the programme was made possible through the support of UTM, SPS UTM, PDG, Malakoff Corporation Berhad, Azuarina Creative Sdn. Bhd., Johor National Parks, Tourism Johor, and other academic and industry partners.

With this successful debut as host, UTM has further strengthened Malaysia’s role in the CAMPUS Asia Plus consortium, inspiring a new generation of researchers, innovators, and global leaders.



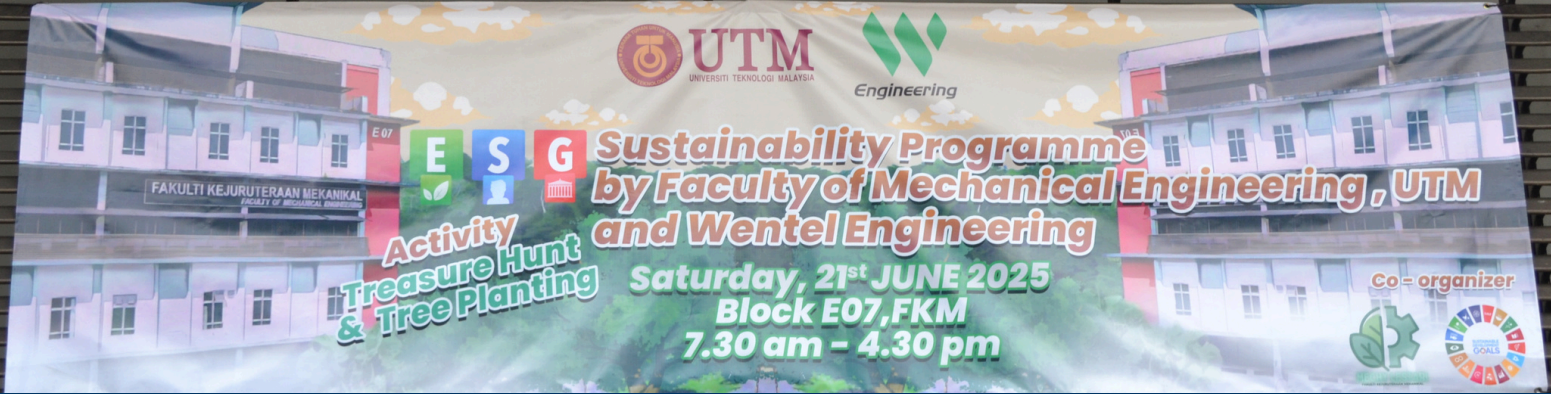
*Exploring the hidden biodiversity of mangroves – participants discover different types of siput (snails) at Tanjung Piai, while a UTM student shares insights on how mangroves can be cultivated and sustained.*



*Participants learned about cutting-edge data centre innovations, from liquid cooling*



*A taste of Malaysia, participants started the day with a traditional local breakfast of kopi and roti kaya toast, followed by enjoying unique Malaysian-style ice cream at Johor Craft*



# ESG Sustainability Programme Inspires Green Action at FKM

*Written by Ahamad Amirul Afhiq bin Ahamad  
 Edited by Ts. ChM. Dr. Nor Suriani Sani*

The ESG Sustainability Programme, held on 21 June 2025 at the Faculty of Mechanical Engineering (FKM), Universiti Teknologi Malaysia, brought together staff, students, and industry partners for a meaningful day dedicated to environmental awareness, community engagement, and sustainable practices. Organized in collaboration with Wentel Engineering Sdn. Bhd., the programme aimed to strengthen understanding of Environmental, Social and Governance (ESG) principles while encouraging the campus community to adopt sustainable habits in an engaging and interactive way.

The programme began with Senaman Lestari, a light exercise session accompanied by traditional music that created a lively and welcoming atmosphere. Participants enjoyed moving together in rhythm, setting a positive tone for the day while fostering a sense of togetherness among the FKM community. One of the most exciting activities was the Treasure Hunt Lestari, where teams worked together to solve sustainability-themed clues hidden around the campus area. The activity encouraged teamwork, creativity, and problem-solving while subtly introducing environmental awareness in a fun, memorable way.

A highlight of the programme was the tree-planting session, symbolizing the faculty's commitment to environmental responsibility. Participants worked together to plant trees around the campus, reinforcing the idea that small actions can contribute to a greener future.

The event also featured an ESG sharing session by representatives from Wentel Engineering, who highlighted the growing importance of ESG values in industry and future workforce development. Officially launched by the Dean of FKM, Prof. Ir. Ts. Dr. Zaini bin Ahmad, the programme successfully fostered collaboration, strengthened community spirit, and inspired participants to embrace sustainability in their daily lives.



# MECHA STAFF GAMES 2025

## Promotes Health, Team Spirit and Staff Engagement

*Written by Ahamad Amirul Afhiq bin Ahamad  
Edited by Ts. ChM. Dr. Nor Suriani Sani*

The Mecha Staff Games 2025 officially began with an energetic and lively morning programme, Riadah Fit@FKM, held on 28 July 2025 at the parking area of Block E07, Faculty of Mechanical Engineering (FKM), Universiti Teknologi Malaysia. Organized by the Badan Rekreasi Amal dan Kebajikan Staf (BRAKe) in collaboration with FKM, the event brought together academic staff, administrative officers, and support personnel for a refreshing start to the faculty's annual sports initiative.

The morning programme featured several engaging activities, including Senamrobik, the FKM Morning Briefing, and a casual "Ngopi Ngeteh Sama-Sama" session that created a relaxed and friendly atmosphere among participants. Staff members arrived early in sports attire, filling the venue with enthusiasm and positive energy as colleagues from different departments gathered to participate.



A key highlight of the event was the official launching ceremony of Mecha Staff Games 2025, officiated by the Dean of FKM, Prof. Ir. Ts. Dr. Zaini Ahmad. The launch shows the faculty's commitment to promoting a healthy lifestyle, building stronger staff relationships, and creating a supportive working culture.

To further enhance team spirit, staff members were divided into four contingents, namely The Tigris, The Panther, The Bison, and The Cobra, each representing friendly competition and unity among departments. Throughout the programme, participants actively interacted with their teammates, strengthening camaraderie as they prepared for upcoming sports events.

The Mecha Staff Games 2025 were held from 30 July to 23 December 2025, featuring seven sports: Petanque, Woodball, Futsal, Bowling, Volleyball, Carrom, and Badminton. These activities aim to promote active living while providing opportunities for staff to connect beyond their daily professional roles. Overall, the programme marked a vibrant beginning for the faculty's sports calendar, reinforcing the spirit of teamwork, wellbeing, and community within FKM.



# PIONEERING MALAYSIA'S PALM OIL MECHANIZATION

Written by Ahamad Amirul Afhiq bin Ahamad  
Edited by Nuratiqah Imani binti Noordin

Universiti Teknologi Malaysia (UTM), in partnership with SD Guthrie Research Sdn. Bhd. (SDGR), has inaugurated the Advanced Mechanization Satellite Lab (AMSL) – the country's first satellite lab focused on research, development, and innovation in palm oil plantation mechanization. The official launch took place on 12 March 2025, with UTM's Deputy Vice-Chancellor (Research and Innovation), Prof. Dr. Rosli Md Illias, and Ir. Dr. Mohd Shiraz Aris, Head of Upstream Research at SDGR, is officiating the event.



Prof. Dr. Rosli described AMSL as more than a research facility. "It embodies UTM's commitment to sustainable solutions that meet industry needs and reflects strong university-industry collaboration. Its establishment aligns with our ASCEND2030 strategic plan, emphasizing high-impact research, sustainable industrial partnerships, and globally competitive talent development."

The lab addresses mechanization challenges on plantations by combining UTM and SDGR's expertise, particularly in developing efficient and sustainable palm oil harvesting technologies.

The AMSL is led by Ir. Dr. Amir Putra Md. Saad was established through strategic collaboration with SD Guthrie Research (SDGR). Since 2021, both parties have worked together on the Integrated Harvesting Mechanism (IHM) initiative to advance mechanization technologies for plantations. This collaboration aligns with the vision of Ts. Dr. Mohd Zulfahmi Mohd Yusoff, Head of Advanced Mechanization Technology at SDGR.

- **Research and Academics:** The initiative prioritizes innovative solutions for plantation mechanization.
- **Talent Development:** Industry expertise is shared to enrich and strengthen the academic curriculum.
- **Graduate Preparation:** The collaboration aims to equip graduates with industry-ready skills and practical exposure.

The establishment of AMSL further reinforces UTM's commitment to advancing mechanical engineering research, fostering interdisciplinary collaboration, and strengthening partnerships between academia and industry to support sustainable innovation in Malaysia's plantation sector.

***"Effective technology comes from understanding field realities and applying solid engineering principles."***

**IR. DR. MOHD SHIRAZ ARIS**  
Head of Upstream Research,  
SD Guthrie Research Sdn. Bhd.

# A NOVEL HYBRID FLAX FIBRE/WIRE MESH STEEL COMPOSITE TUBE FOR ENHANCED ENERGY ABSORPTION

*Written by Prof Dr. Mohd Yazid bin Yahya*

*Edited by Ts. Dr. Muhammad Asyraf bin Muhammad Rizal*

The increasing demand for lightweight yet high-strength structural materials has driven significant interest in hybrid composite systems capable of maintaining superior performance under extreme loading conditions. In response to this need, researchers from the Centre for Advanced Composite Materials (CACM) at Universiti Teknologi Malaysia (UTM) have developed a novel hybrid flax fibre/wire-mesh steel cylindrical composite tube designed to achieve enhanced energy absorption and crashworthiness. This innovative work was undertaken by Ahmad Tanton, a Master of Science (Mechanical Engineering) student, under the supervision of Prof. Dr. Mohd Yazid Yahya, the Director of CACM at UTM.

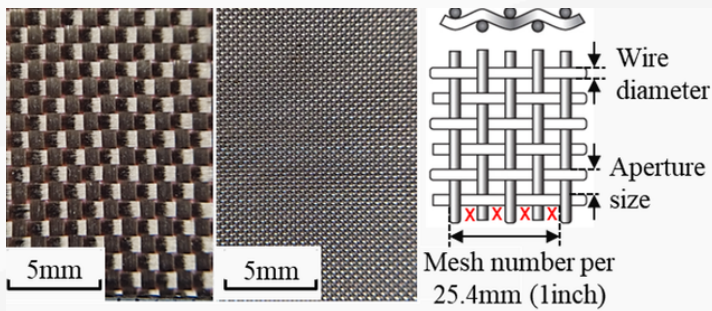
Composite materials have long been recognized for their high specific strength, stiffness, and energy absorption potential, particularly in impact-resistant applications. However, conventional fibre-reinforced composites, such as those reinforced with glass or carbon fibres, often exhibit brittleness and limited strain-to-failure, leading to sudden, catastrophic fracture under compressive or impact loading. To address these limitations, the hybridization of natural fibres with metallic reinforcements has emerged as an effective approach, combining the ductility and energy dissipation capacity of metals with the lightweight and stiffness advantages of fibre composites.



**PROF DR. MOHD YAZID BIN YAHYA,**  
Director  
Centre for Advanced Composite Materials  
Universiti Teknologi Malaysia

In this research, flax fibre was selected as the primary natural reinforcement owing to its renewability, low density, and favourable mechanical properties. To complement its stiffness and improve the composite's ductility, layers of stainless-steel wire mesh (T304) were incorporated into the composite architecture. The inclusion of wire mesh was characterized by high tensile strength, corrosion resistance, and excellent elongation at break (up to 20%), enabling the hybrid tube to sustain progressive deformation during axial compression and reducing the risk of brittle fracture. This synergistic reinforcement strategy enables the hybrid composite to exhibit both high stiffness and controlled plastic deformation, thereby optimizing its energy-absorption characteristics.

The hybrid flax/wire-mesh composite tubes were fabricated using the vacuum infusion technique, with Epicote 1006 epoxy resin as the polymer matrix. The fabrication process involved a systematic layup of alternating flax fibre and wire mesh layers around a cylindrical mandrel, followed by vacuum-assisted resin impregnation and thermal curing. After curing, the composite tubes were demoulded, sectioned, and prepared for quasi-static axial compression testing using an INSTRON DX660 servo-hydraulic testing machine operating at a constant crosshead speed of 5 mm/min.



### *Composition of hybrid composites from woven flax and wire mesh*

The experimental findings revealed notable improvements in energy absorption (EA), specific energy absorption (SEA), and crash force efficiency (CFE) for the hybrid composites compared to their non-hybrid counterparts. Tube diameter was found to play a critical role in determining crashworthiness performance. For non-hybrid flax fibre tubes, the highest CFE value of 0.49 was achieved at a 75 mm diameter. In contrast, the hybrid flax/wire mesh tubes reached optimum performance at a 65 mm diameter, displaying a 47.83% increase in CFE relative to the non-hybrid configuration. However, further increases in diameter beyond this threshold led to a decline in CFE, attributed to unstable deformation and reduced interlaminar shear strength.

In terms of energy absorption, the steel wire mesh/flax fibre composite tubes with a 65 mm diameter exhibited the highest performance, with absolute energy absorption and specific energy absorption values 33.41% and 26.93% higher, respectively, than those of the 55 mm tubes. At this optimal diameter, the hybrid tubes also demonstrated 70.04% greater absolute energy absorption and 25.23% higher SEA compared to pure flax fibre tubes. These results indicate that the integration of wire mesh reinforcement, together with optimal geometric design, significantly enhances both the energy dissipation capability and crashworthiness of the composite structure.

All tested composite tubes displayed similar progressive deformation modes, characterised by longitudinal splitting and outward buckling along the tube midsection – a behaviour indicative of controlled, stable energy absorption. The hybrid flax/wire mesh configuration exhibited superior energy dissipation due to its combined ductile-brittle deformation response, effectively mitigating catastrophic failure and promoting uniform load transfer throughout the crushing event.



### *Damage progression of the hybrid wire mesh/flax composite tubes during the crushing event*

Overall, this study highlights the potential of hybrid natural fibre/metallic composite systems in advancing energy-absorbing structural technologies. The integration of flax fibres and wire mesh has been shown to markedly improve mechanical stability, crash performance, and failure controllability under axial loading. These findings demonstrate that hybridisation can effectively overcome the intrinsic brittleness of traditional fibre composites, paving the way for the design of next-generation lightweight crashworthy components in automotive, aerospace, and defence applications. This innovation aligns with UTM and FKM's ongoing mission to develop sustainable, high-performance materials that bridge the gap between advanced engineering design and green technology solutions.

# FILAMENAS: SUSTAINABLE 3D PRINTING FROM PINEAPPLE WASTE

*Written by Ahamad Amirul Afhiq bin Ahamad  
Edited by Nuratiqah Imani Binti Noordin*

A synergistic effort between the SMK Tan Sri Mohamad Rahmad and the Social Innovation Team of the Faculty of Mechanical Engineering (FKM) UTM, led by Assoc. Prof. Ir. Ts. Dr. Nor Hasrul Akhmal bin Ngadiman achieved remarkable results by developing 3D Printing filament from Pineapple Waste, based on the "Waste to Wealth" concept.



Cikgu Suraya's innovation and her team of students' work gained global recognition. In Malaysia, the team won Gold Awards at Malaysia Technological Expo (MTE) and Penang International Invention, Innovation & Design (PIID). The team then continued to shine on global stages, earning a Bronze Award at the Seoul International Invention Fair (SIIF) 2025 and securing Special Awards from the Ministry of Education of Saudi Arabia and the Indonesian Invention & Innovation Association.

This collaboration shows our commitment to helping schools across Johor help students reach their potential and creativity at an international level, developing Malaysia's future competitive inventors.

The prototype development for the filament begins by collecting pineapple skins, which are then dried and ground into Fibre. The fibres will then be mixed with waste plastics and other materials, then hot-pressed and rolled into usable filaments for 3D printing. This method not only uses pineapple skins and plastics that are usually thrown away, but also prevents these plastics from accumulating in our waste disposal sites, reducing pollution and creating sustainable ways to manufacture products.



"Initiatives in developing interests towards innovation within students from a young age are a strategic investment towards the nation's future. Malaysia could rise to become the world's technology creator and manufacturer if the proper opportunity and guidance are provided for our youth."

**Assoc. Prof. Ir. Ts. Dr. Nor Hasrul Akhmal bin Ngadiman**





*FILAMENAS Team's group photo along with advisors from UTM*



*Bronze Award - Seoul International Invention Fair 2025*



*Special Award - Ministry of Education, Saudi Arabia*

# Flying at 30,000 ft.

The sweet spot between physics and practicality



*Written by*

**DR. HELMEY RAMDHANEY  
MOHD SIAH**

Senior Lecturer  
Faculty of Mechanical  
Engineering  
Universiti Teknologi Malaysia

## Physics meets common sense

Every mechanical engineer has faced those curious questions from non-engineers: “Why do planes fly so high?” The short answer is because 30,000 ft is the paradise flight: not too high, and not too low, just about right. It’s where the laws of thermodynamics, fluid dynamics and economics all shake hands politely. Commercial aircraft such as Boeing 777X and Airbus A350 cruise comfortably between 30,000 and 40,000 ft. At these altitudes, the air is thin enough to reduce drag but still sufficient for the engine to breathe and produce effective thrust. Think of it as the sweep spot of the sky, where engineers have optimized every equation to make flying profitable, safe, and surprisingly elegant. Of course, engineers don’t like to admit that it’s also the altitude where passengers are least likely to notice how small their legroom is.

## Less air, more efficiency

At sea level, air is dense. About  $1.2 \text{ kg/m}^3$ . Great for breathing, but terrible for drag. As an aircraft climbs higher, air density decreases exponentially, meaning there’s less resistance for the wings to slice through. That translates to lower parasite drag, which improves fuel efficiency. The Boeing 787 Dreamliner, for instance, typically cruises around 35,000-40,000 ft, where drag is about 80% lower than at ground level. This efficiency allows aircraft to burn less fuel and extend their range.

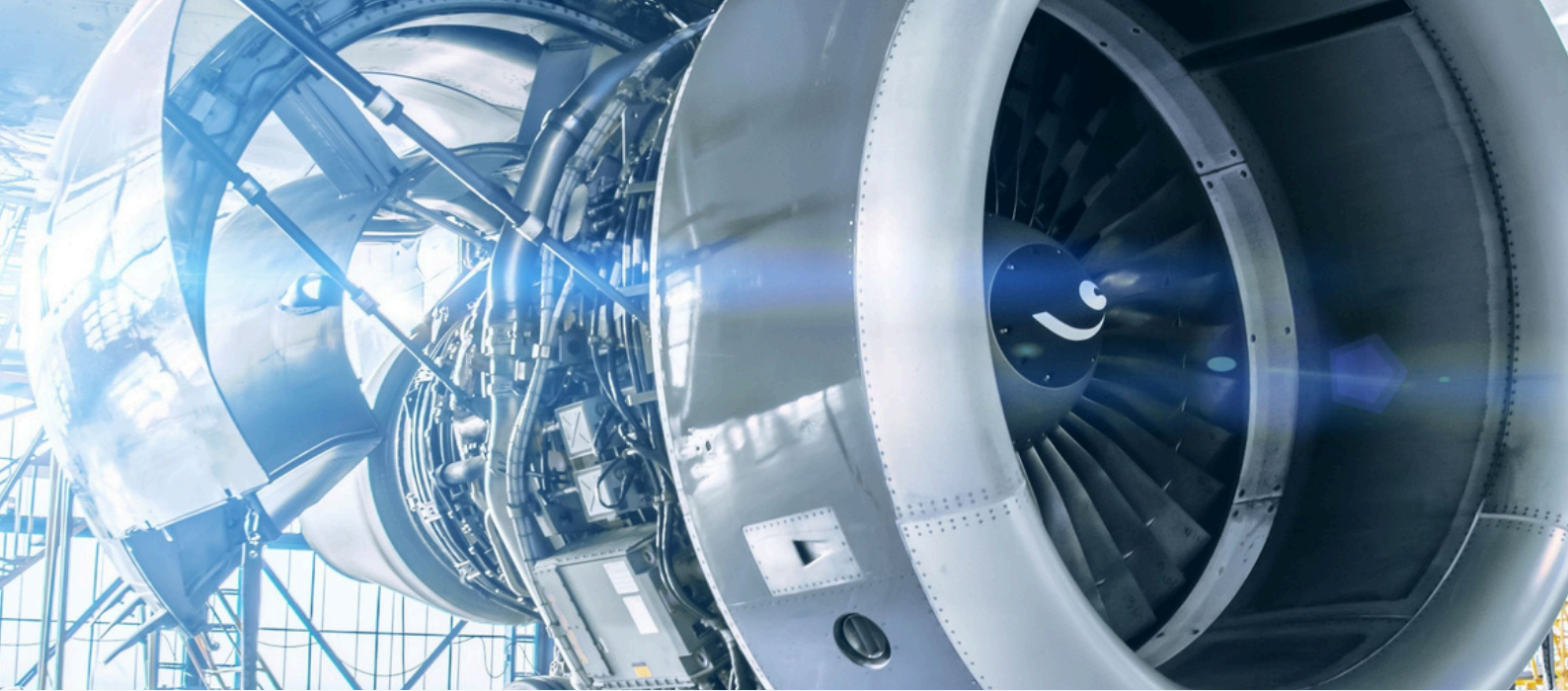
This is crucial when flying from Kuala Lumpur to Heathrow with 200 passengers, none of whom are willing to pay extra for excess baggage. Engineers like to think of altitude as their version of vanishing point for drag - the higher we go, the more efficient the system becomes, until physics or nature tells us to stop showing off.

## The air is thin, but not too thin

There is a reason planes don’t cruise at 60,000 ft., except for a very specific-purpose aircraft. Gas turbine engines, brilliant as they are, need oxygen to burn fuel in the combustion process. The higher you go, the less oxygen there is, and the harder the engines must work to maintain thrust. For humans, 10,000 is as far as we can go. Any higher, we shall see stars appearing right in front of our eyes. Most modern turbofan engines, such as the GE9X and Trent-XWB, are designed to perform optimally at altitudes between 30,000 and 40,000 ft. At that altitude, the balance between oxygen availability, fuel efficiency and thrust output is almost perfect. Too low and drag increases dramatically. Too high, and engines start gasping for air, and like our wallet at the end of the month.

## The temperature advantage

The troposphere, which extends up to roughly 36,000 ft., features a steady drop in temperature, about a  $2 \text{ }^\circ\text{C}$  drop for every 1000 ft gained, the lapse rate. At cruising altitude, temperatures often drop to  $-40 \text{ }^\circ\text{C}$ , which sounds extreme but is a blessing for jet engines. Cooler air means better compressor performance and reduces thermal stress on the turbine blades. In essence, the engines are “cooled-headed” at high altitudes, producing more thrust per kilogram of fuel than they would in the scorching air near the ground.



### **Avoiding the weather**

Weather plays a huge role in choosing cruise altitude. Most clouds and storms live below 25,000 ft, so flying higher keeps passengers and cabin crew happy. At around 30,000 ft, aircraft glide above most weather disturbances, experiencing smoother air and less structural stress. The Airbus A321neo, typically cruising at 33,000-37,000 ft, takes advantage of this to ensure consistent performance and passenger comfort. At these levels, there's less turbulence and fewer atmospheric "speed-bumps".

### **Pressurization: Keeping humans comfortable**

Cabin pressurization systems are designed to simulate an altitude of 6,000 - 8,000 ft inside, even when the aircraft is cruising at 35,000 ft. This ensures a comfortable oxygen environment and prevents passengers from feeling like they are climbing Mount Kinabalu without training. However, a higher altitude means a greater pressure difference between the inside and outside of the aircraft, placing greater stress on the fuselage. Engineers carefully design simulated altitudes that balance this structural load with aerodynamics and economic performance. In other words, we fly high enough to save fuel, but not too high that the cabin turns into a pressurized soda can.

### **The sweet spot**

When combining fuel efficiency, engine performance, passenger comfort, and structural safety, the result is a cruising band roughly between 30,000 and 40,000 ft, which pilots call the Flight Level (FL) band, FL300 to FL400. On the Kuala Lumpur to Tokyo route, for instance, a B787 might climb to 39,000 ft. after a few hours, once it has burned off enough fuel to become lighter. On a shorter Kuala Lumpur to Bangkok trip, an A321neo would settle near 33,000 ft. Every meter count, and every Newton of thrust is calculated with surgical precision. It's that perfect balance of thermodynamics, aerodynamics and airline economics.

### **Above clouds and below satellites**

So next time you are on a flight above 30,000 ft., remember: you're not just cruising through thin air. You are flying inside a meticulously engineered compromise between physics and practicality. It's a triumph of modern mechanical engineering: optimizing performance, managing extreme environments, and designing for both comfort and cost. The next time you look out your tiny airplane window and see the curves of the Earth, know that every Pascal, Kelvin, and Newton was carefully investigated. After all, at 30,000 ft., the air might be thin, but the engineering behind it is certainly not.

# INNOVATIVE APPROACH IN WATER QUALITY ASSESSMENTS

*Written by Ahamad Amirul Afhiq bin Ahamad  
 Edited by Ts. ChM. Dr. Nor Suriani Sani*

River and inland water pollution remains a critical challenge to environmental sustainability and public safety in Malaysia. Although awareness of environmental protection has increased, water quality monitoring in many locations still relies on manual sampling methods. These methods often require personnel to work in hazardous environments such as polluted rivers, industrial zones, and remote water bodies, raising concerns about safety, operational efficiency, and data accuracy.

To address these challenges, researchers at Universiti Teknologi Malaysia's (UTM) Marine Technology Centre (MTC) have developed AquaSURV, an innovative Unmanned Surface Vehicle (USV) designed for remote and real-time water quality monitoring. The project is led by Ir. Dr. Nik Mohd Ridzuan Shaharuddin, Director of MTC, in collaboration with industry partner Omahams Corporation Sdn. Bhd., combining marine engineering expertise with intelligent monitoring technology.



AquaSURV is designed to monitor inland waters such as rivers, lakes, reservoirs, and high-risk industrial areas. It is powered by an environmentally friendly electric propulsion system, while larger versions integrate solar energy to improve energy efficiency and reduce reliance on conventional power sources.

The system is equipped with integrated sensors that measure key water quality parameters, including pH, dissolved oxygen, turbidity, temperature, salinity, and oil contamination. Additional sensors such as nitrate and ammonia detectors can be installed depending on monitoring needs. Through 4G wireless connectivity, data is transmitted to cloud platforms and monitoring centres, enabling real-time analysis and faster decision-making.

With its compact design and agile operation, AquaSURV supports both routine environmental monitoring and emergency response missions. The innovation received international recognition with a Silver Medal and a Special Award from the Vietnam Fund for Supporting Technological Creation (VIFOTEC), awarded to Ts. Dr. Saiful Anuar Abu Bakar and his team from the Faculty of Mechanical Engineering (FKM), UTM.





Langkawi International Maritime & Aviation (LIMA) 2025



Industrial Art & Technology Exhibition & Competition (INATEX) 2025



Putrajaya Festival of Ideas (FOI) 2024



# MARINE TECHNOLOGY CENTRE

## Advancing Marine Engineering Research and Innovation

*Written by Dr. Mohd Rajali bin Jalal  
Edited by Ts. ChM. Dr. Nor Suriani Sani*

The Marine Technology Centre (MTC) at Universiti Teknologi Malaysia (UTM) stands as a leading hub for marine engineering research, education, and industry collaboration in Malaysia. Established in 1996 and officially opened in 1999 by Malaysia's fourth Prime Minister, Tun Dr. Mahathir Mohamad. The centre has played a vital role in supporting the nation's maritime and offshore industries through advanced hydrodynamic research and testing facilities.

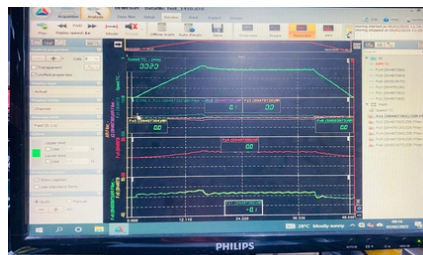
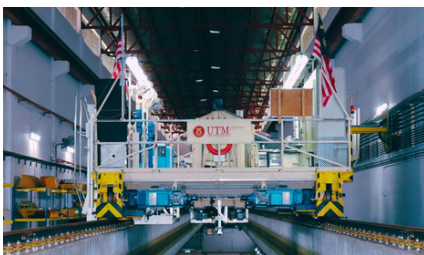
As the only hydrodynamic testing centre in the country, MTC provides a comprehensive platform for teaching, research, and technical consultancy. It supports undergraduate and postgraduate education while facilitating research activities for academic staff and industry partners. Since 1998, the centre has also been a member of the International Towing Tank Conference (ITTC), ensuring its testing practices meet internationally recognized standards.

One of the centre's most notable facilities is its towing tank, measuring 120 metres in length with a 90-metre testing section. This facility allows researchers and engineers to conduct detailed studies on ship resistance, propulsion, and seakeeping performance under controlled conditions.

Complementing the towing tank are advanced systems, including a precision towing carriage, wave generator, motion capture technology, and a ship model milling machine, all designed to support accurate hydrodynamic testing and simulation.

Beyond experimental testing, MTC also integrates digital engineering tools, including Computer-Aided Engineering (CAE) and Computational Fluid Dynamics (CFD), to design and optimize marine vessels. These capabilities enable researchers to improve vessel performance, safety, and efficiency while meeting modern environmental regulations.

Through its expertise, facilities, and collaborations with universities and industry partners worldwide, MTC continues to strengthen Malaysia's maritime research ecosystem. By bridging academic knowledge with real-world engineering challenges, MTC contributes significantly to the development of innovative marine technologies and sustainable solutions for the global maritime industry.



# Congratulations!



## FKM RESEARCHER APPOINTED TO THE MEMBER OF THE YOUNG SCIENTIST NETWORK, ASM!

Written by Ahamad Amirul Afhiq bin Ahamad  
Edited by Nuratiqah Imani Binti Noordin



A researcher from our faculty, Ts. Dr. Muhammad Asyraf bin Muhammad Rizal, a senior lecturer in the Department of Applied Mechanics & Design and a research fellow at UTM's Centre of Advanced Composite Materials (CACM), has been appointed as a new member of the Young Scientists Network - Academy of Science Malaysia (YSN-ASM) on 7th Jan 2026. This recognition was conferred during the YSN-ASM Induction Ceremony 2026 at MATRADE Tower, Kuala Lumpur.

The platform is a prestigious platform under the Academy of Science Malaysia (ASM) where the nation's emerging scholars with outstanding early-career achievements in research, leadership potential and strong commitment are gathered, communicated and lead the change across national policies and initiatives in advancing science and technology across various disciplines, fields and specializations in Malaysia.

Dr. Muhammad Asyraf's main research interests include: (1) Design Development and Concurrent Engineering, (2) Characterization of Polymer Composites, (3) Creep and Service Life Analysis. He has published more than 200 journal articles, an international book and book chapters with an H-index of 46 (Scopus database). He has also been recognized as a member of the World Top 2% Scientists by Stanford University. Throughout his years at UTM, he had secured prestigious grants, including the Fundamental Research Grant Scheme (FRGS) from the Ministry of Higher Education and industrial grants from Meiban Micro Sdn. Bhd. He has also received UTM grants through the UTM Encouragement Research and UTM Matching Grant programs. Currently, he is supervising 3 PhD students and 1 master's student who has graduated.



The Faculty of Mechanical Engineering, UTM, extends its heartiest congratulations to Dr. Muhammad Asyraf on this well-deserved achievement and looks forward to his continued contributions to research excellence, mentorship, and national scientific development.

*Congratulations!*

# WORLD'S TOP 2% SCIENTISTS FOR CITATION IMPACT IN 2024

Congratulations to the following researchers of the Faculty of Mechanical Engineering UTM for being listed as the TOP 2% Scientists by Elsevier B.V., Stanford University!



## CAREER LONG ACHIEVEMENT 2024

**PROF. DR. WONG KUAN YEW**

## SINGLE YEAR ACHIEVEMENT 2024



**PROF. TS. DR. SAFIAN  
BIN SHARIF**



**PROF. DR. MAZLAN BIN  
ABDUL WAHID**



**PROF. DR. WONG  
KUAN YEW**



**PROF. IR. DR.  
SYAHRULLAIL BIN  
SAMION**



**TS. DR. MUHAMMAD  
ASYRAF BIN  
MUHAMMAD RIZAL**

This achievement reflects their research excellence and serves as an inspiration across FKM and the academic community in Innovating Sustainable Solutions -  
In the Name of God for Mankind!

A recognition of scholarly excellence by:



# INNOVATING FOR DISABILITY-INCLUSIVE EDUCATION

Congratulations to the researchers of our faculty for their achievements in the 2<sup>nd</sup> Innovation for Disability-Inclusive Education Competition 2025 at Kuching, Sarawak.



## POCKET SIZED ELECTRONIC BRAILLE EREADER FOR THE VISUALLY IMPAIRED

Team Leader:  
**Dr. Muhammad Danial bin Abu Hasan**  
Achievement:  
**Silver Award**



## EBRAILLE 2.0

Team Leader:  
**Dr. Wan Aliff bin Abdul Saad**  
Achievement:  
**Silver Award**



## ELECTRONIC EMBOSSER BRAILLER FOR EDUCATION SOLUTION

Team Leader:  
**Assoc. Prof. Ir. Dr. Mohd Zarhamdy bin Md. Zain**  
Achievement:  
**Bronze Award**





Dr. Muhammad Danial bin Abu Hasan (Pocket Sized Electronic Braille eReader for the Visually Impaired)



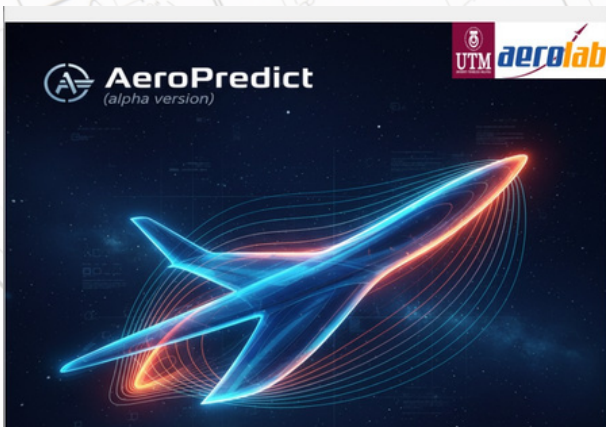
UTM Representative at the 2<sup>nd</sup> Innovation for Disability-Inclusive Education at Kuching, Sarawak



Certificates and Plaques awarded to our dedicated team of researchers

# OUR RESEARCHERS' SOLUTIONS: FROM THEORY TO APPLICATION

Congratulations to the researchers of our faculty for their achievements in the Innovation Art & Technology Exhibition & Competition (INATEX) 2025



## AIRCRAFT AERODYNAMICS PREDICTION USING ARTIFICIAL INTELLIGENCE

**Team Leader:**

Assoc. Prof. Ir. Dr.  
Shabudin bin Mat

**Achievement:**

Silver Award



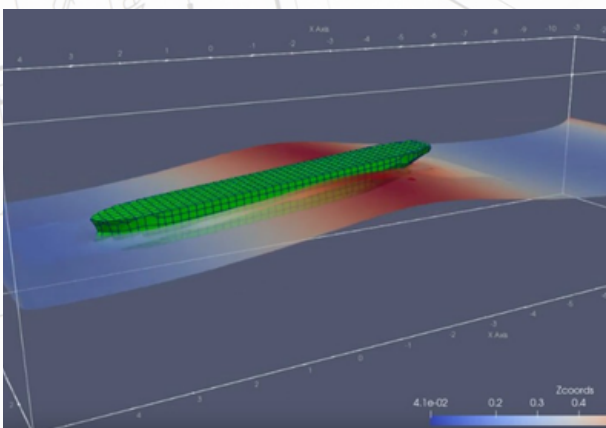
## LIGHTWEIGHT GFRP HUMAN CAPSULE FOR SAFER OPERATION

**Team Leader:**

Dr. Mohd Ayub bin Sulong

**Achievement:**

Silver Award



## SAMUDERACFD: DEDICATED CFD SUITE FOR ESTIMATION OF MARINE HYDRODYNAMIC PERFORMANCE

**Team Leader:**

Dr. Mohd Hazmil Syahidy  
bin Abdol Azis

**Achievement:**

Bronze Award





# MECHANICAL ENGINEERING STUDENT ASSOCIATION (MESA)

Written By Ahmad Arfan Azhari,  
Edited by Nuratiqah Imani Binti Noordin

The Mechanical Engineering Student Association (MESA) is the official student body representing students of the Faculty of Mechanical Engineering, Universiti Teknologi Malaysia (UTM). The association has a long-standing history within the university, tracing its origins to the establishment of the faculty itself.

Formerly known as Persatuan Kejuruteraan Jentera (PETERA), the association rebranded in 2020 as MESA. This change aligns with our goal to become a modern, future-oriented platform that supports student development in a rapidly evolving engineering landscape. The previous name, "PETERA," was closely linked to the faculty's former title, Fakulti Kejuruteraan Jentera, symbolizing the association's deep-rooted presence in UTM.

## Vision

To be the centre of professional engineering development, creativity, and innovative solutions in the field of mechanical engineering

## Mission

To provide mechanical engineering students with opportunities for hands-on learning, professional growth, and industry engagement through workshops, projects, competitions, and networking events.

## Motto

Pioneering Innovation, Creating Opportunities

## Activities Overview

During the 2024/2025 session, MESA effectively organized and participated in a range of academic, technical, community, and sports activities. These programs were designed to enhance student skill sets, promote industrial exposure, and boost community engagement.

## Academic & Technical Events

### IDeX'25 Exhibition

Participation in showcasing innovative mechanical engineering projects and student research work.

### Rube Goldberg Machine Challenge 2025 (RGMC'25)

Student engagement in creative engineering problem-solving through a national-level competition.

### UTeM Delegations

Representation of UTM at external academic and technical events.

### JZ Industrial Talk

A knowledge-sharing session conducted by JZ industry professionals, promoting career awareness and technical insights.



## Community Engagement

- Pameran Lestari Bersama Komuniti Taman Pulai Flora

A sustainability-focused exhibition conducted with the local community to promote environmental awareness.



*MESA conducting an Explorace programme with the youth and children of Taman Pulai Flora, encouraging teamwork, active participation, and community bonding.*

## Pathway Programmes

- Pathway Talks with KMKJ
- Pathway Talks with KMJ

Career and academic guidance sessions aimed at supporting student progression and professional readiness.



*Speech given out by Dr. Mohd Haziq Dzulkifli explaining future careers opportunities at KMKJ*

## Sports & Student Wellness

- Faculty of Mechanical Engineering Sports Day 2025 (FAMES'25)
  - Volleyball Team Participation
  - Chess Competition

These events encouraged teamwork, healthy competition, and student well-being.



*Participants giving their best performance in the FAMES'25 volleyball match organised by MESA.*

MESA remains committed to its long-term goal of shaping future-ready mechanical engineers through continuous learning opportunities, professional development, and community engagement. As the association moves forward, it aims to expand its reach, foster innovative student initiatives, and strengthen its role as a leading engineering student organization in UTM.

## Follow us!





COLLEGIATE CHAPTER UTM

# STUDENT CHAPTER AUTOMOTIVE ENGINEERING UNIVERSITI TEKNOLOGI MALAYSIA (SAE-UTM)

Written by Ahmad Arfan Azhari  
Edited by Nuratiqah Imani Binti Noordin

SAE-UTM is a student-led automotive engineering chapter that serves as a leading platform for dynamic and automation-based initiatives at Universiti Teknologi Malaysia. In line with its vision, SAE-UTM contributes to education and society by offering experiential learning that connects theory with real-world application. SAE-UTM uses innovative learning approaches focused on dynamic systems-design, coding, manufacturing, and prototyping-to nurture technical excellence, creativity, and problem-solving skills across all levels of education.

### Vision

SAE-UTM as a leading platform in dynamic and automation events that contribute towards education and society.

### Mission

"Innovate learning focusing on dynamic systems for all levels of education involving design, coding, manufacturing and prototyping."

### Slogan

"Drive the Future"



*UTM Formula Student Racing Team achieved no. 5 in Formula Student Malaysia 2025 - Internal Combustion Engine 400-800cc Category*



*Automotive Maintenance Workshop for students at P23*



*Industrial visit to Sime Darby Joy Industries*



# INDUSTRIAL ENGINEERING CLUB (IEC)

Written by Ahmad Arfan Azhari  
Edited by Nuratiqah Imani Binti Noordin

## Vision


To Be A Leading Student Organization That Nurtures Future Industrial Engineers With Strong Ethical Values, Technical Expertise, And Leadership Skills, While Fostering Innovation And Collaboration In The Engineering Community.

## Mission

"The IEC aims to provide students with industry-relevant knowledge, skills, and best practices while promoting ethical decision-making and professionalism in engineering. Through networking opportunities with industry experts, IEC enhances student engagement and fosters meaningful connections. Additionally, the organization strives to strengthen its recognition and influence within the university and the broader engineering community. By encouraging teamwork, leadership, and active participation among members, IEC cultivates a dynamic and supportive environment for future engineers.

## Slogan

Integrate. Innovate. Industrialize

 [iec\\_utm](https://www.instagram.com/iec_utm)





# AERONAUTICAL STUDENTS CLUB (AERO CLUB UTM)

Written by Ahmad Arfan Azhari

Edited by Nuratiqah Imani Binti Noordin

The Aeronautical Students Club (AERO CLUB UTM) is the official student body representing Aeronautical Engineering students from the Faculty of Mechanical Engineering, Universiti Teknologi Malaysia (UTM).

## Vision

Towards forming a generation of highly visionary who innovate with the application of the latest science and technology in line with the aspiration to appreciate the diversity of aeronautical knowledge that will benefit students.

## Mission

To form a holistic understanding for all ages of students on the importance of knowledge and knowledge related to aeronautics and related to it in a sustainable manner

## Motto

Integrate. Innovate. Industrialize



Aero Club UTM



aeroclubutm



aeroclubutm



aeroclubutm19@gmail.com



AERODEX 25 , 27 May 2025, UTM Rugby Field



LIMA'25, 23- 25 May 2025, MIEC, Langkawi



SG AIRSHOW 24, 24 February 2024, Changi Exhibition Centre, Singapore



# PERSATUAN TEKNOLOGI MARIN (TEKNOMARIN)

Written & Edited by Nuratiqah Imani Binti Noordin

The Persatuan Teknologi Marin (TEKNOMARIN) is established with the aim of nurturing well-rounded naval architects who are capable of competing on a global stage. Focusing on developing strong technical knowledge, practical skills, and professional awareness in the design, construction, and operation of ships, boats, and marine structures. Through academic, industrial, and hands-on activities, the club prepares members to meet the demands of the modern marine and offshore industry at all levels.

## Vision

To be a premier institution providing Top-Quality Education in Marine Technology while upholding moral principles, integrity and trustworthiness.

## Mission

Organises an extensive programme of marine industry talk, Workshops and Training Courses, Covering a broad range of experience and opinion on all aspects of the design, construction and maintenance and operation of all marine vessels and structure

## Motto

Towards Oceanic Exploration



## Activities Overview

### Previous Activities (Session 2024/2025)

During the 2024/2025 session, TEKNOMARIN actively organised and took part in various academic, technical, community, and sports activities. These initiatives were designed to enhance students' skills, promote industry exposure, and foster meaningful engagement with the community.

- **Team-building Naval 2024/2025**

Encouraging teamwork, healthy competition and student well-being

- **MIMEX EXHIBITION 2025**


An international maritime and offshore industry exhibition held at the Kuala Lumpur Convention Centre (KLCC), bringing together global industry players as a key platform for technology, innovation, and industry networking in Malaysia.


- **IMARTEX '25**

Representation of UTM Naval Architecture and Offshore Engineering at external academic and technical events.

- **MARINNOVATE '25**

Showcasing UTM's naval architecture education and research while providing a competitive platform for students and the public to engage in creative, industry-relevant marine technology challenges.

 [teknomarintm](#)

 [Persatuan Teknologi Marin UTM](#)



NASDEC, ITS Surabaya, IMARTEX '25



MIMEX EXHIBITION 2025



Mt. Bromo, East Java - IMARTEX '25

# MUHAMMAD HAZIQ FADZI - PRINCETON DIGITAL GROUP (PDG) JOHOR DATA CENTRE

*Edited by Ts ChM Dr Suriani Sani*



For many students, the journey into engineering begins in a classroom. For Muhammad Haziq Fadzi, it began much earlier—in his father’s workshop.

Growing up, he spent much of his time watching his father repair car engines, fix household appliances, and handle various mechanical tasks around the house. With a welding machine and a lathe readily available, he developed a fascination with how things worked. To him, an engineer was someone who could fix the world with their hands. Combined with his curiosity from watching documentaries on manufacturing and production lines, this early exposure sparked a desire not just to use machines, but to understand how they truly function.

University life, however, soon humbled that confidence. One of the toughest challenges he faced was the Applied Numerical Methods course. For the first time, he received a ‘D’ on his results slip. The transition from online learning to physical examinations, coupled with complex projects, left him struggling to understand where he had gone wrong.

Yet the setback became a turning point. When he retook the course in his final year, he approached it differently—focusing on understanding the physical concepts behind the mathematics rather than memorizing formulas. The result was a remarkable improvement, turning a ‘D’ into an ‘A’. More importantly, he learned that persistence and strong fundamentals are essential in engineering.

His passion truly ignited during the Mechatronics and Instrumentation courses. Together with his team, he developed projects such as a Rice Level Sensor and an Automatic Water Gate and Flood Monitoring System. Seeing ideas evolve into functioning automated solutions gave him the confidence to pursue engineering beyond the classroom.

Today, he is a Graduate Engineer Trainee at Princeton Digital Group (PDG), rotating through Systems, Technical, and Project departments. Looking back, he believes engineering is not a solo journey—sometimes, a single conversation or opportunity can change the direction of an entire career.



# MUHAMMAD AKIF NAQUIDDIN ZAHAR - SHELL MALAYSIA

*Edited by Ts ChM Dr Suriani Sani*

- Origin: Terengganu
- Education: B.Eng Mechanical Engineering, UTM (Class of 2023)
- Current Role: Wellsite Operations Engineer (Drilling & Completion), Shell Malaysia
- Personal: State Chess Champion (7 years) & Viral Landscape Photographer

## Building the Foundation at UTM

Akif's journey began at UTM's Faculty of Mechanical Engineering (FKM), where he developed a fascination for how machines solve real-world problems. While subjects like Thermodynamics and Fluid Mechanics formed his technical backbone, the "sleepless nights" of projects and labs taught him something equally vital: discipline and mental endurance. Beyond the lecture halls, Akif was a fixture in university life. He served as the University Chess Captain and held leadership roles in SRM, PERMATA, and SASC. Balancing high-level competitive sports with a minor in Energy wasn't easy. Still, it sharpened the leadership, communication, and adaptability skills he now relies on in the fast-paced energy sector.

## The Path to the Shell Graduate Programme

Akif's interest in energy crystallized during his final year at a career fair in KLCC. A conversation with a UTM alumnus working at Shell made the dream feel attainable. Drawn to Shell's global reputation and its commitment to the energy transition, Akif set his sights on their competitive Graduate Programme. Preparation was key. He mastered the STAR Method for interviews and thoroughly researched the company's values. After a brief tenure at Texas Instruments, his persistence paid off when he joined Shell in May 2024.

## Life on the Frontline: Wellsite Operations

Now based in Miri, Akif works as a Wellsite Operations Engineer (WSOE). In the high-stakes world of offshore drilling, he provides critical technical support to the Drilling Supervisor. His daily responsibilities include:

- Engineering calculations and on-site operations.
- Generating daily drilling reports and operational lookaheads.
- Managing logistics, materials, and Personnel on Board (POB).

"Transitioning from student to professional was a leap," Akif notes. "In the field, your decisions directly impact safety and cost. It pushes you beyond your comfort zone every single day."

## Words of Wisdom

Akif remains deeply grateful to the FKM faculty and his mentors for the professionalism and ethics they instilled in him. To current UTM students, he offers this advice:

"Focus on building strong fundamentals, but never underestimate teamwork. Success rarely happens overnight—consistent effort and a growth mindset will open doors you never expected."





**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Marine Technology  
Centre

*Marine Technology Centre, Faculty of Mechanical,  
Universiti Teknologi Malaysia*



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of  
Mechanical Engineering

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