

ENGINITIUM

The official bulletin of the Research Office, Faculty of Engineering, Universiti Malaysia



NET ZERO AND SUSTAINABILITY

“And He has set up the balance, so that you may not transgress the balance. And establish weight in justice and do not make deficient the balance.” – Qur’an 55:7–9

This reflects the principle of maintaining equilibrium i.e. very close to the modern idea of keeping emissions and removals in balance (net zero).



“The race to net zero is not a choice, it is the only pathway to a sustainable future.” – António Guterres, UN Sec-General

“We are using resources as if we had two planets, not one. There can be no ‘Plan B’ because there is no ‘Planet B.’” – Ban Ki-Moon (former UN Sec-General)

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Over the past seven decades, Universiti Malaya (UM) has grown into a thriving urban campus in Kuala Lumpur. However, many of its buildings from the 1970s–1990s were constructed for practicality rather than long-term efficiency, leading to high maintenance and resource costs.

In 2023, UM's electricity bill reached RM37.1 million, while water consumption amounted to RM8.2 million, contributing significantly to national carbon emissions alongside transport, sewerage, and waste.

Rising student and staff numbers, coupled with disconnected campus clusters and limited sustainable transport, have further intensified these challenges.

In response, UM has introduced the Net Zero Strategic Plan 2030, building on the UM Master Plan 2050, the Eco Campus Blueprint 2015, and national sustainability policies. This roadmap outlines six key sectors of action to reduce carbon emissions, enhance resource efficiency, and promote sustainable mobility, in line with the United Nations Sustainable Development Goals (SDGs).

By learning from regional leaders such as UTEM, USM, NTU, NUS, and Thammasat University, UM aims to transform into a low-carbon, liveable, and sustainable campus, strengthening its position in global sustainability rankings.

Source: Universiti Malaya Net Zero Blueprint, UMSDC 2024

"Empowering Futures, Sustaining the Planet."



1.0 Foreword

السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللَّهِ وَبَرَكَاتُهُ

“At the Faculty of Engineering, academic excellence and research advancement remain at the heart of our mission. Yet, we believe true education goes beyond classrooms and laboratories, and it is about shaping future engineers who are resilient, ethical, and ready to contribute meaningfully to society.

The 2024/2025 academic session has been a remarkable journey of growth and achievement. Our students have excelled not only in their studies but also in leadership, innovation, and community engagement. From international competitions and industry collaborations to impactful volunteering and mobility programmes, these accomplishments reflect the strength, versatility, and determination of our student community.

As the Office of Student Affairs, we are committed to ensuring that every student is supported throughout their journey. We continue to strengthen wellbeing initiatives, broaden professional development opportunities, and create inclusive platforms that nurture creativity and leadership. These efforts are designed to complement the academic experience, preparing our graduates to be not only technically proficient but also globally minded and socially responsible.

Looking ahead, our priorities remain clear:

1. To strengthen student support systems that foster wellbeing and resilience.
2. To expand opportunities for leadership, mobility, and industry engagement.
3. To cultivate a campus culture of inclusivity, collaboration, and lifelong learning.

To our students: approach your time here with curiosity, courage, and compassion. Every experience, whether a challenge or a triumph, shapes you into the leader you aspire to be.

To our alumni and partners: your continued guidance and support are invaluable in empowering our students to achieve their fullest potential.

We would also like to express our sincere gratitude to the Dean’s Office, the Deputy Dean of Undergraduate Degree Office, the Deputy Dean of Higher Degree Office, the Deputy Dean of Research Office, and the Deputy Dean of Development Office for their strong support and unwavering cooperation in all student-related activities. Their encouragement and commitment have been instrumental in ensuring the success of our initiatives and in enriching the student experience at the Faculty of Engineering

May this edition of Engenitium serve as both a reflection of our shared achievements and an inspiration to continue striving for excellence in academics, in leadership, and in life”.



DR. SUHANA BINTI KOTING
Deputy Dean of Student Affairs
Faculty of Engineering
Universiti Malaya



2.0 Research Highlights



Traffic Study in Universiti Malaya Campus

Universiti Malaya, Malaysia's oldest research university, faces rising traffic congestion on its century-old campus infrastructure. Although sustainable transport facilities exist, dependence on private cars remains high, contributing to congestion, air pollution, and carbon emissions.

Survey findings reveal that **convenience, accessibility, and affordability** are the main determinants of transport choices among students. Environmental sustainability ranks low in decision-making. Over 50% of respondents never use the campus bus service, citing long waiting times, limited frequency, irregular schedules, and lack of route awareness. Bus users are mostly junior students, while senior students tend to transition to private vehicles.

Walking remains a popular mode for short distances but is constrained by insufficient shaded walkways, resting areas, and disability-friendly facilities. E-bike adoption is negligible due to safety concerns, poor infrastructure, and lack of awareness.

Key recommendations includes

- Bus service optimization (increased frequency, revised routes, CCTV, improved signage, and awareness campaigns).
- Digital upgrades (enhanced bus tracking app with smart notifications and integrated route planning).
- Pedestrian facilities (expanded covered walkways, shaded paths, disability access improvements).
- Cycling & e-scooter promotion (dedicated lanes, parking, guidelines, and affordable shared services).

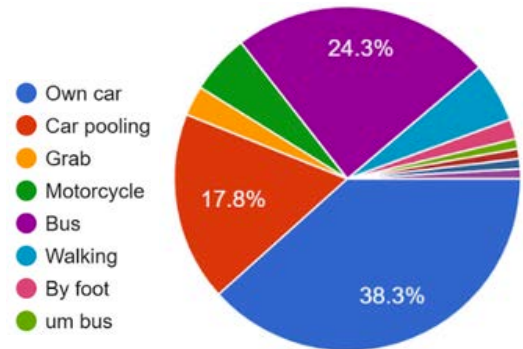


Fig. 1: Most frequent transport mode on campus



Fig. 2: Covered walkway near Geology department

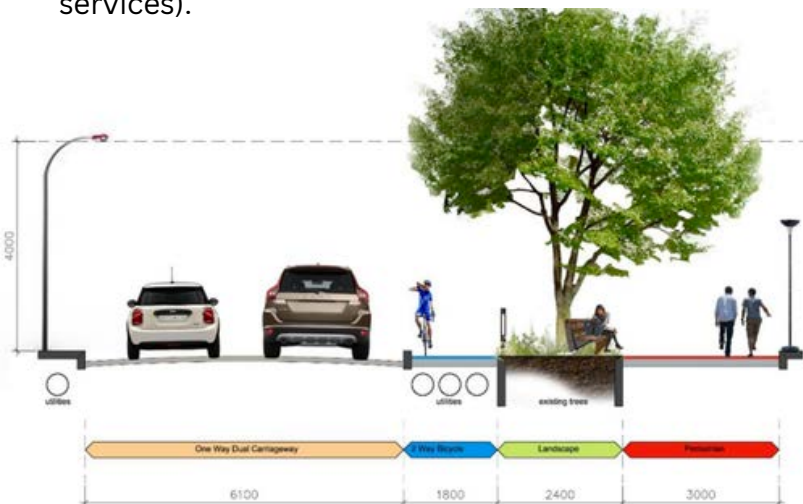


Fig. 3: Landscape design in UM Master Plan 2050



Assoc. Prof. Ir. Ts. Dr. Yuen Choon Wah (PI)
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Therefore, an integrated, multimodal sustainable transport strategy is essential for reducing car dependence and aligning UM's mobility ecosystem with its Campus Master Plan 2050 vision.

Energy Auditing and Environmental Retrofitting of UM Heritage Buildings

This project centers on Block G, a heritage building at Universiti Malaya, which currently falls short of modern green building standards. The study investigates the building’s energy performance, focusing on the inefficiencies in its HVAC and lighting systems. Through an energy audit and Building Information Modelling (BIM) using Autodesk Revit, the project proposes sustainable retrofitting strategies. These efforts are in line with Malaysia’s national goal of reducing carbon emissions by 45% by 2030.

The objectives of this research include: determining the baseline energy consumption of Block G, identifying suitable retrofitting measures to reduce energy usage, and assessing the potential of BIM and life cycle assessment to support sustainable building practices in heritage structures. The research outline is shown in Figure 1

A comprehensive 3D model of Block G was developed using Revit, detailing its architectural, electrical, and HVAC components. This digital model enabled simulation of energy use, visualization of retrofitting interventions, and efficient multidisciplinary collaboration. BIM significantly improved decision-making accuracy and reduced errors in design workflows.



Figure 2: 3D BIM Model of Block G

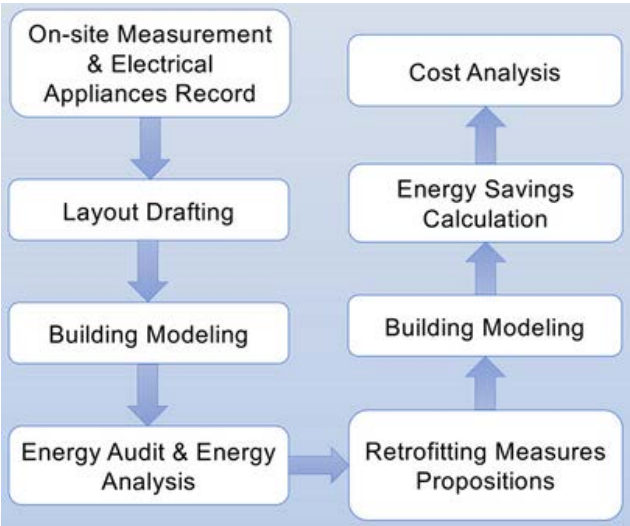


Figure 1: Research Framework

The energy audit revealed that HVAC systems contribute between 58% and 87% of the total energy use, while lighting systems contribute around 20% to 25%. The building suffers from inadequate insulation, outdated windows, and limited natural lighting, all contributing to excessive cooling demands.

Three tiers of retrofitting interventions were identified. Level 1 involves low-cost changes like switching to LED lighting and conducting awareness campaigns, with an estimated energy reduction of 5–15%. Level 2 includes moderate-cost upgrades such as double-glazed windows and efficient HVAC units, offering 25–40% energy savings. Level 3 comprises high-cost measures like roof insulation and solar PV installation, potentially reducing energy use by up to 68%.

Cost analysis using Net Present Value (NPV), Payback Time (PBT), and Internal Rate of Return (IRR) suggests that the proposed retrofitting solutions are financially viable. With a typical payback period under 10 years, these upgrades are cost-effective in the long run and provide a strategic advantage for institutional sustainability as shown in Figure 3.

In particular, the use of solar energy to supplement electricity of the building leads to the highest savings in both energy and costs.

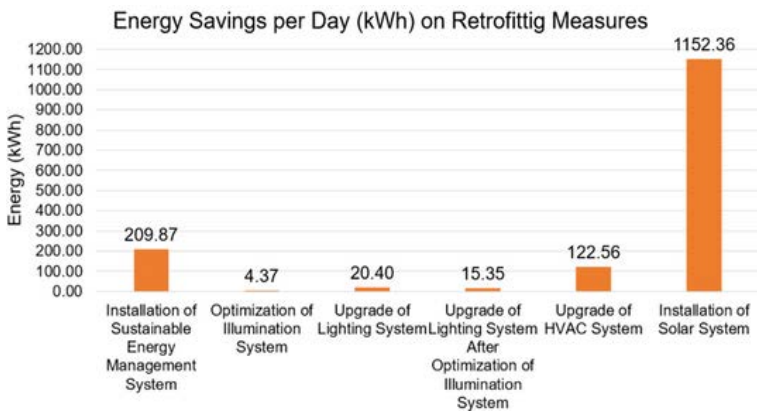


Figure 3: Energy savings per day (kWh) based on retrofitting measures



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Community Engagement on Water Issues in Kampung Repek, Bachok, Kelantan

On 23 July 2024, a Universiti Malaya team (three lecturers and two research assistants) met with 11 residents and the district Penggawa to share findings from a water study conducted in March and September 2023.

Key Issues Raised by Residents

- Piped water:** Low pressure, inconsistent supply, and concerns over cleanliness.
- Groundwater:** Odorous near paddy fields, better inland, but saline near the coast due to seawater intrusion; some samples appeared yellow and sticky. Odor removal, chlorine safety, filter efficiency, and comparisons with commercial filters.

Research Objectives

1. To assess water quality in Kampung Repek.
2. To develop rice husk-based filter membranes.
3. To examine socio-economic impacts of water issues.

Key Findings

The water quality is safe for drinking pH (6.5). However, filtration was recommended for the contamination which linked to human activity and seawater intrusion.

The development of membrane i.e. rice husk filters to reduce odor and discoloration is without chemical risks but are not yet fully effective.

In terms of the socio-economic impact, all respondents were from the B40 group where 77% rely on groundwater use, 50% use the filters, and 20% of them buy bottled water (sometimes for religious use). Despite those issues, 69% of respondents expressed satisfaction with supply due to ongoing engagement with Air Kelantan.



Conclusion : The engagement allowed researchers to present results, clarify the potential of rice husk membranes, and enhance residents' understanding of water quality challenges while fostering collaboration for future solutions.



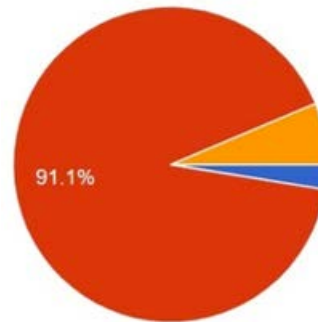
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THE STUDY ON THE EFFECT OF ELECTRIC SCOOTERS AS A TRAVEL MODE IN UNIVERSITI MALAYA CAMPUS

A recent study at UM explored the safety and impact of e-scooters within the campus. Data was collected through on-site trials, where participants rode e-scooters on selected roads and walkways, alongside a questionnaire survey to capture socio-demographic profiles and user experiences.

Findings revealed potential safety concerns, particularly conflicts between e-scooters and pedestrians on walkways, as well as with motorised vehicles on roads. The study highlights the need for improved infrastructure and safety measures to ensure that e-scooters can be integrated effectively into UM's sustainable transport ecosystem.

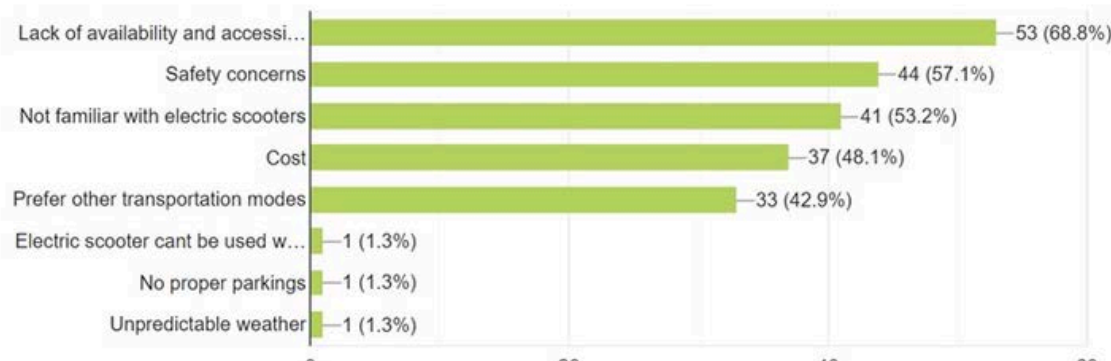


Are you currently using an electric scooter on UM campus?

- If YES, proceed to question 2.3, 2.4, 2.5, and 2.6
- If NO, proceed to question 2.7
- Maybe in the future

2.7 If you are **NOT** using an electric scooter, which of the following factors contribute to your decision? (Check all that apply)

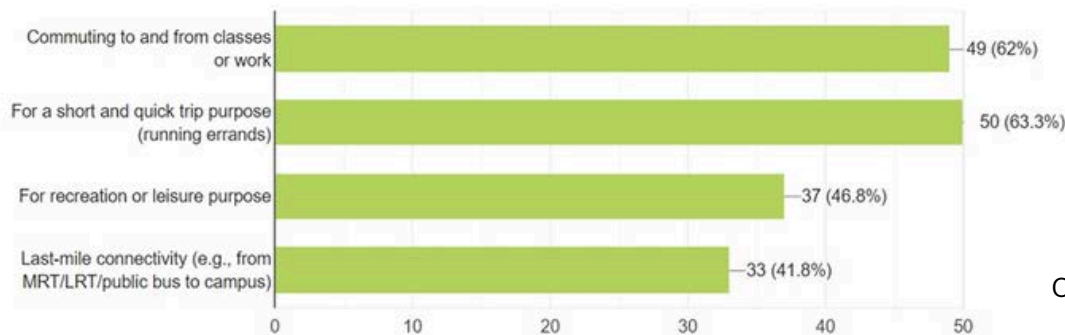
77 responses



By addressing these challenges, UM can enhance its Sustainable Policy (Pillar 3: Traffic Management), making e-scooters a safer, more inclusive, and eco-friendly mobility option. This effort supports UM's vision of building a liveable, low-carbon, and sustainable campus environment for campus community.

2.8 What will be the primary purposes if you have an electric scooter to be used on campus?

79 responses



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3.0 Activity & Action!

JULY - SEPTEMBER 2025

Objectives

- a) To provide technical staff with exposure to principles and best practices in road design, construction, and maintenance.
- b) To enhance understanding of standards, codes of practice, and legal requirements related to road engineering in Malaysia.
- c) To develop analytical and problem-solving skills through discussions of real case studies.
- d) To encourage knowledge and experience sharing between academics and technical staff.
- e) To support the faculty's efforts in producing competent, competitive, and responsible technical staff who prioritize road user safety.

Road Safety Engineering Workshop

Date : 13 - 14 August 2025
Time : 9:00 am - 5:00 pm
Venue : The Cube, Block L, Faculty of Engineering, UM

Speakers :

- (1) Assoc. Prof. Ir. Ts. Dr. Yuen Choon Wah
- (2) Ir. Dr. Mohd Rasdan Ibrahim
- (3) Dr. Suhana binti Koting

Organised by :

Deputy Dean (Development) Office
Faculty of Engineering



Exchange Students Embrace Green Mobility

With Shared Micro-Mobility options like bikes and e-scooters, you can zip to class, **cut down on carbon emissions**, and avoid the hassle of traffic. It's a fun, **low-carbon way to travel while keeping our campus clean and sustainable for everyone!**



Three Master's students from Ehime University, Japan, are undertaking a one-month attachment at the Faculty of Engineering, Universiti Malaya, from 2 September to 2 October 2025 under the Exchange Student Program. This initiative is made possible through a special Memorandum of Agreement (MOA) between Universiti Malaya and Ehime University, a collaboration that has been successfully implemented since 2022, with Dr. Shaifulazuar and the Deputy Dean (Student Affairs) Office serving as the persons-in-charge.

In support of the university's commitment to sustainability and low-carbon mobility, the students have been provided with bicycles as their primary mode of commuting within the campus during the attachment period.

The participating students and their supervisors are:

SONO KAZUMA, supervised by Dr. Suhana Koting, Deputy Dean (Student Affairs)
HORIIE KAZUKI, supervised by Assoc. Prof. Ir. Dr. Anis Salwa, Head of Dept. of Electrical Eng.
HORI AYANO, supervised by Assoc. Prof. Ir. Dr. Nasrul Anuar, Deputy Dean (Development)

Getting around campus just got easier and greener!

Total Station Equipment Training

Date : 9 September 2025
Time : 9:00 a.m. – 4:30 p.m.
Venue : Surveying Laboratory, Block F, Faculty of Engineering, UM
Supplier : Bandwork GPS Solutions Sdn. Bhd.

Participants included technical staff, lecturers, postgraduate students, and postdoctoral researchers.



Objectives of the Training

- To enhance the skills of staff and students in using laboratory equipment correctly and effectively.
- To ensure compliance with safety procedures when operating equipment in order to minimize the risk of accidents.
- To provide practical exposure on the functions, basic maintenance, and troubleshooting of laboratory equipment.



Smart City Connect 2025

Smart City Connect 2025 held as part of the 8th ASEAN Smart Cities Network (ASCN8) activities in Kuala Lumpur brought together government, industry, academia and civil-society actors to showcase innovations, exchange policy ideas and build partnerships for smarter, more inclusive cities.

The Faculty of Engineering, Universiti Malaya (UM), represented by the Centre for Transportation Research (CTR), participated as an exhibitor and participant in the Smart City Expert Talk series.



UM's presence showcased research on urban mobility, transport safety and evidence-based planning, and helped strengthen university-government-industry linkages while positioning UM as a regional thought leader on transport aspects of smart cities.



Second Russian-Malaysian Seminar on Strategic Minerals

This seminar represents a continuing and deepening collaboration between our two institutions, built on a shared vision to advance research, innovation, and international dialogue in the field of strategic minerals.

Day 1 (22 Sept. 2025)

Opening ceremony and welcoming speech

Professor Ir. Dr. Nik Nazri Nik Ghazali, Dean, Faculty of Engineering, UM

Professor Talovina Irina Vladimirovna

Department of Historical and Dynamic Geology, SPMU

Professor Dr. Hendrik Simon Cornelis Metselaar

Department of Mechanical Engineering, UM

Professor Skublov Sergey Gennadievich,

Associate Professor, Petrov Dmitry Anatolyevich
Department of Mineralogy, Crystallography, and Petrology,
Empress Catherine II, SPMU

Associate Professor Ir. Dr. Syed Fuad bin Saiyid Hashim

The Institute of Mineral Engineering (IME) Malaysia, USM

Professor Alexandrova Tatiana Nikolaevna

Assistant Professor, Kuznetsov Valentin Vadimovich
Department of Mineral Processing, Empress Catherine II, SPMU

Dr. Mohd Zamri Bin Zainon @ Baharom

Department of Mechanical Engineering, UM

End of Day 1

Day 2 (23 Sept. 2025)

Dr. Zulhelmi Amir

Department of Chemical Engineering, UM

Associate Professor Isheisky Valentin Alexandrovich

Department of Blasting Engineering, Empress Catherine II, SPMU

Professor Bazhin Vladimir Yurievich

Department of Metallurgy, Empress Catherine II, SPMU

Associate Professor Dr. Meor Hakif Bin Amir Hassan

Department of Geology, UM

Professor Plotnikova Irina Nikolaevna, Dr. Grokhotov Evgeny Igorevich

Problem-Oriented Research Laboratory in Earth Science,
Empress Catherine II, SPMU

Closing ceremony by Empress Catherine II, SPMU, Russia

Virtual Seminar

SECOND RUSSIAN-MALAYSIAN SEMINAR ON STRATEGIC MINERALS

Let's exchange opinions and exchange ideas

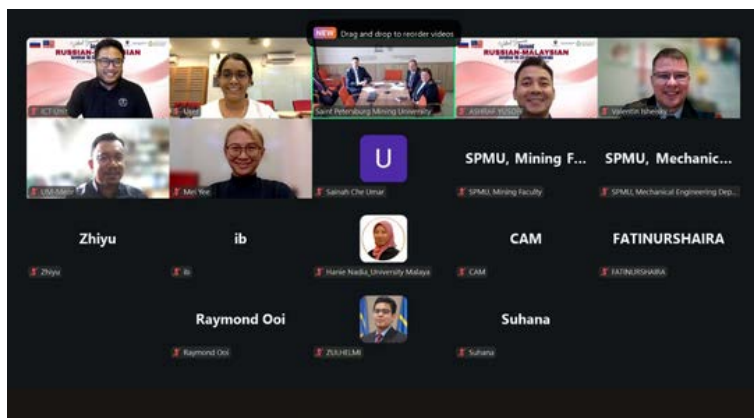
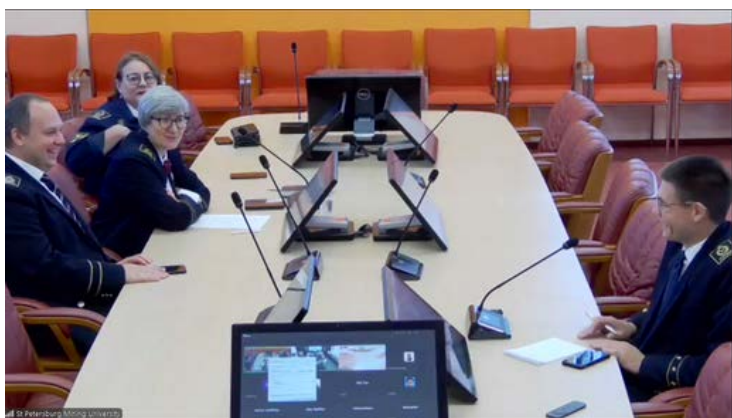
22 - 23 SEPTEMBER, 2025

MSK: 09:00 am - 12:00 noon
MSIA: 2:00 pm - 5:00 pm

Join with Zoom
CLICK HERE FOR ZOOM MEETING
<https://zoom.us/j/98199431453>

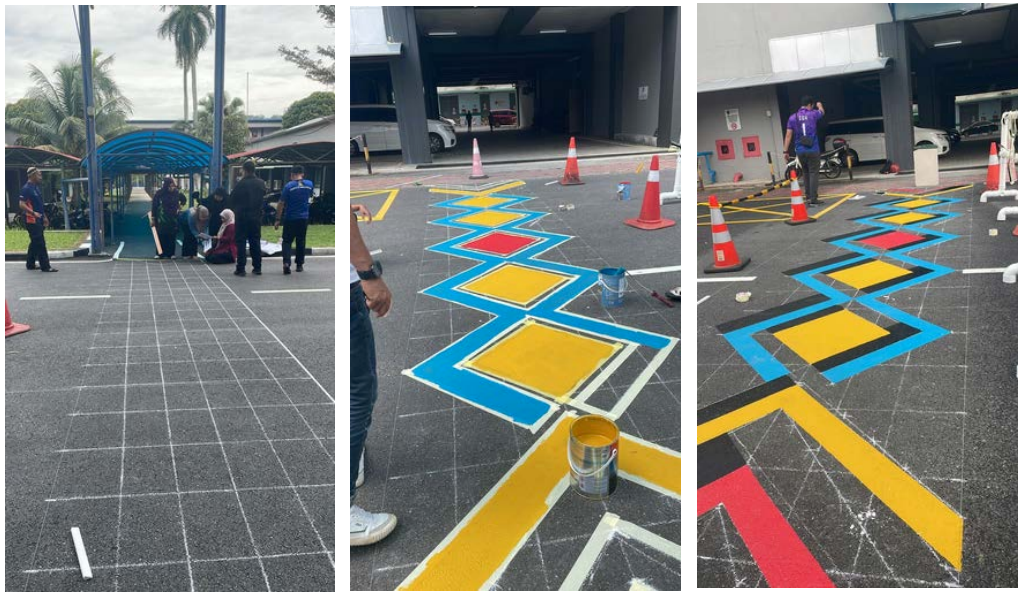
REGISTER NOW

Hosted by: Faculty of Engineering, Universiti Malaysia
Jointly organised by Universiti Malaysia & Empress Catherine II
Saint Petersburg Mining University



Stepping Safely, Walking Proudly: Malaysia's 3D Batik Crossing

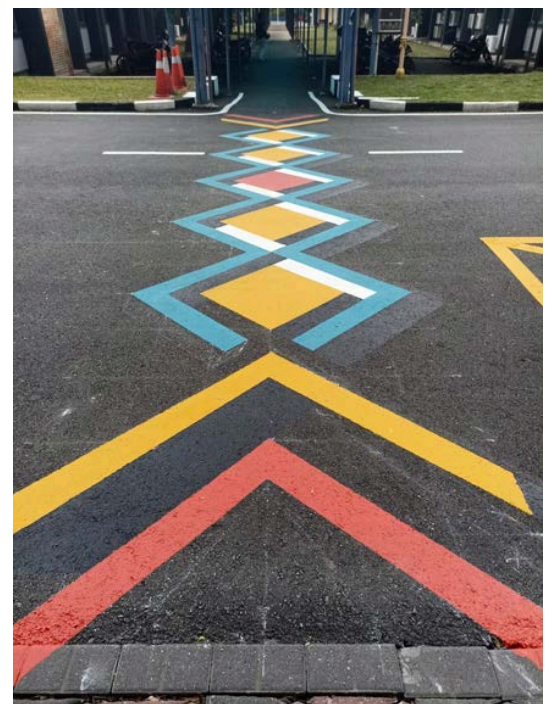
The 3D Batik Crossing Design is an innovative outcome from the Impact-Oriented Interdisciplinary Research Grant Programme (IIRG) 2020–2021, led by a multidisciplinary team at Universiti Malaya: **Dr. Suhana Koting (Department of Civil Engineering)**, **Gs Dr. Nur Aulia Rosni (Department of Urban and Regional Planning)**, and **Dr. Yong Adilah Shamsul Harumain (Department of Urban and Regional Planning)**. The project was rooted in a case study on **active transportation and walkability in Kg Kerinchi, Pantai Dalam**, where the team investigated walking safety and observed that many pedestrians avoided using conventional zebra crossings. The study provided insights into pedestrian behaviour, road-crossing patterns, and safety perceptions, which inspired the development of a new, engaging design to encourage safer pedestrian practices.



The implementation idea gained momentum when **Dr. Suhana Koting and Assoc. Prof. Ir. Dr. Nasrul Anuar Abd Razak (Deputy Dean of Development, Faculty of Engineering)** envisioned adapting the crossing at the **Faculty of Engineering, Universiti Malaya**. The aim was not only to **promote safe road-crossing behaviour** among students and staff but also to **add vibrancy and identity** to the faculty, blending functionality with cultural expression.

Technically, the 3D Batik Crossing integrates visual illusion principles making the markings appear raised to alert drivers while enhancing pedestrian safety. Zebra crossings are vital as they legally prioritize pedestrian right-of-way, but studies in Malaysia have shown underutilization due to low visibility, driver non-compliance, and lack of awareness.

The **3D Batik Crossing Design** represents more than a traffic-calming intervention; it is a **fusion of engineering, planning, and heritage**. It embodies innovation while honouring tradition, symbolizing Malaysia's creative approach to safer, more inclusive urban mobility. Looking forward, our hope is that this initiative will not remain limited to the Faculty of Engineering. We aspire to see it expanded across the Universiti Malaya campus and eventually beyond Kuala Lumpur, bringing safer, more engaging, and culturally distinctive crossings to communities nationwide. This project demonstrates how research can translate into real-world solutions that protect pedestrians, celebrate local identity, and reimagine Malaysia's urban spaces.



4.0 Meet Our Researcher

MEET DR MOHD HAFIZAN MD ISA

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https://umexpert.um.edu.my/hafizan_isa.html

Dr. Mohd Hafizan Md Isa is a senior lecturer in the Department of Civil Engineering at the University of Malaya, combining academic expertise with valuable industry experience. He has worked with consultancy and international engineering firms, as well as in technical and academic support roles involving project management and technical design. His research focuses on sustainable construction materials and soil stabilization, with a strong emphasis on recycling waste and industrial by products for infrastructure applications.



He is actively engaged in projects that promote sustainable construction practices, including the development of environmentally friendly materials and innovative solutions for improving infrastructure performance and durability. His areas of interest include Geotechnical Engineering, Ground Improvement, and Geomaterials, and his work seeks to merge environmental sustainability with practical engineering solutions to create greener, more resilient, and resource-efficient infrastructure.

Selected Publication

Isa, Mohd Hafizan Md; Koting, Suhana; Hashim, Huzaifa; Ab Aziz, Salsabila; Mohammed, Syakirah Afiza (2023). Structural Characteristics and Microstructure Analysis of Soft Soil Stabilised with Fine Ground Tile Waste, MATERIALS. 16(15). doi:10.3390/ma16155261

Isa, Mohd Hafizan Md.; Koting, Suhana; Hashim, Huzaifa; Mo, Kim Hung; Ab Aziz, Salsabila (2024). Utilising tile waste as an additive to enhance lime-based subgrade stabilisation, CASE STUDIES IN CONSTRUCTION MATERIALS. 20. doi:10.1016/j.cscm.2024.e03342

Mohammed, Syakirah Afiza; Koting, Suhana; Babalghaith, Ali Mohammed; Isa, Mohd Hafizan Md.; Khairuddin, Faridah Hanim (2025). Influence of Coal Bottom Ash as Fine Aggregate Replacement on the Mechanical Properties of Stone Mastic Asphalt, APPLIED SCIENCES-BASEL. 15(12). doi:10.3390/app15126826

Areas of interest

Geotechnical
Engineering,
Ground Improvement,
and
Geomaterials

5.0 List of Publications

JULY - SEPTEMBER 2025

Investigation of the Performance and Fuel Oil Corrosion Resistance of Semi-Flexible Pavement with the Incorporation of Recycled Glass Waste
<http://dx.doi.org/10.3390/ma18153442>

Integrated analysis of strength, microstructure, and environmental impact of thermally activated ladle furnace slag cement mortar
<http://dx.doi.org/10.1016/j.conbuildmat.2025.141712>

Improving rainfall forecasting using deep learning data fusing model approach for observed and climate change data
<http://dx.doi.org/10.1038/s41598-025-13567-2>

Innovative valorization of basic oxygen furnace slag in gypsum-based sustainable building blocks
<http://dx.doi.org/10.1016/j.jobe.2025.112489>

Role of sulphate-based additives on the early age properties of Portland cement incorporating alumina-rich ladle furnace slag
<http://dx.doi.org/10.1016/j.cscm.2025.e04336>

Comprehensive evaluation on the properties of blended cement containing calcined paper sludge
<http://dx.doi.org/10.1617/s11527-025-02701-1>

Wind tunnel test and numerical study on the control of wake-induced vibrations of parallel hangers around the bridge tower using spacers and damping cable
<http://dx.doi.org/10.1016/j.istruc.2025.109153>

Valorization of high-volume crushed waste glass as fine aggregate in foamed geopolymer
<http://dx.doi.org/10.1016/j.cscm.2025.e04202>

Enhancing Calcium Phosphate Cements: A review of Bacterial Cellulose (BC) and other Biopolymer Reinforcements for Biomedical Applications
<http://dx.doi.org/10.1016/j.bioadv.2025.214245>

Forecasting solar power generation as a renewable energy utilizing various machine learning models
<http://dx.doi.org/10.1007/s00704-025-05596-8>

A label-free electrochemical immunosensor on gold-printed electrode for the electrochemical detection of C-reactive protein from blood samples
<http://dx.doi.org/10.1007/s00604-025-07252-4>

A preliminary study on deep neural network-based adaptive control for robotic ankle-foot prosthesis with speed and terrain flexibility
<http://dx.doi.org/10.1080/00207179.2025.2537253>

Hemodynamics and structural mechanics of the aortic valve after Ozaki procedure: a systematic review
<http://dx.doi.org/10.1088/1361-6560/adece0>

Self-Reported Musculoskeletal Problem during Stop-Go Driving: The Combined Variables Contribution towards Knee Pain among Car Drivers
<http://dx.doi.org/10.18502/ijph.v54i7.19154>

'Tracheid effect' light scattering response of common commercial species of Malaysia using red laser (650 nm) for grain angle detection, and machine learning based performance prediction
<http://dx.doi.org/10.1007/s00226-025-01653-7>

Gut microbiota profiles of peninsular Malaysian populations are associated with urbanization and lifestyle
<http://dx.doi.org/10.1038/s41598-025-07117-z>

Performance improvement of heat transfer and drag reduction through pristine polymer gum arabic and gum karaya and their hybrid in circular pipe flow
<http://dx.doi.org/10.1007/s10973-025-14336-z>

Blockchain-secured IoT-federated learning for industrial air pollution monitoring: A mechanistic approach to exposure prediction and environmental safety
<http://dx.doi.org/10.1016/j.ecoenv.2025.118442>

Enhancing Bone Grafts: Unveiling the Degradation Behaviour of Poly (lactic-co-glycolic acid) - Calcium Composites for Advanced Bone Repair
<http://dx.doi.org/10.1080/09205063.2025.2460370>

Silver Nanoparticles Synthesised with Red Betel Leaf (*Piper crocatum*) Extract as a Photosensitiser for Inactivation of *Escherichia coli* and *Staphylococcus aureus*
<http://dx.doi.org/10.17576/jsm-2025-5407-05>

Utilizing black phosphorus as a Q-switcher in Nd-doped fiber laser system
<http://dx.doi.org/10.1007/s10946-024-10229-y>

Mediating in situ-generated fluorescence for Au nanocluster-based multi-color ratiometric detection of alkaline phosphatase
<http://dx.doi.org/10.1039/d5ay00835b>

Utilizing chromium gallium carbide for C-band Q-switched pulse laser generation
<http://dx.doi.org/10.1080/09500340.2025.2538701>

Research on RBF-PID hybrid drive control models for drone pesticide applications in tropical orchards
<http://dx.doi.org/10.1080/10095020.2025.2519374>

Microsecond and picosecond pulse generation in an Erbium-doped fiber laser using a polyaniline-reduced graphene oxide (PANI-rGO) based saturable absorber
<http://dx.doi.org/10.1088/1402-4896/ade93c>

Tailoring Waist Diameter of Tapered Optical Fiber Coated with MXene Ti3C2Tx For Enhanced Relative Humidity Sensing
<http://dx.doi.org/10.1080/01468030.2025.2512302>

Optimizing Titania-supported iron catalysts for high-performance FT-CO₂ conversion
<http://dx.doi.org/10.1088/2053-1591/adf1dc>

Plantwide Control and Economic Analysis of n-Butane Isomerization Process
<http://dx.doi.org/10.1002/apj.70073>

Microalgae and Human Disorders: Mechanistic Insights and Therapeutic Potential
<http://dx.doi.org/10.2174/0115680266365289250701180840>

A novel deep eutectic solvent-based liquid membrane for the extraction of glycerol from crude biodiesel
<http://dx.doi.org/10.1002/aocs.12951>

Enhancing CO₂ capture efficiency using optimized 3D-Printed structured adsorbents
<http://dx.doi.org/10.1016/j.seppur.2025.131495>

Incorporation of transition metal-oxide on 3D porous carbon network for electrochemical water desalination and heavy-metals removal.
<http://dx.doi.org/10.1016/j.electacta.2025.146337>

Prediction construction for biomass and high-density polyethylene co-gasification via statistical method and machine learning
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Carbon capture and storage (CCS): CO₂ basaltic mineralization through the phase transition from gas-solid to aqueous under low reaction kinetics http://dx.doi.org/10.1007/s12665-025-12455-2	Fatigue behavior and design of reinforced concrete beams strengthened with PCM-BFRP grids http://dx.doi.org/10.1016/j.istruc.2025.109649
Quantum physics analysis of electroencephalogram signals for drug users using distribution of quantum uncertainty products http://dx.doi.org/10.1016/j.bspc.2025.107816	Q-switched and Mode-Locked pulse generation in fiber laser with micro particles polyacrylonitrile absorber http://dx.doi.org/10.1016/j.yofte.2025.104208
Experimental correlations for Nusselt number and friction factor in a flat solar air collector equipped with triangular-rectangular ribs http://dx.doi.org/10.1016/j.ijheatfluidflow.2025.109860	A tunable wavelength Q-switched fiber laser at C-band region by using CuPc as a saturable absorber http://dx.doi.org/10.1007/s12648-025-03579-z
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Single-magnetometer 3D localization of DC electromagnets with high precision http://dx.doi.org/10.1016/j.measurement.2025.117464	Effects of Sc₂O₃/ZrO₂ co-doped TiO₂ composite thin layer on the performance of antifogging properties for optical applications http://dx.doi.org/10.1016/j.jics.2025.101983

Source: Deputy Dean of Research Office, Faculty of Engineering, Universiti Malaya

6.0 Meet Our Alumni

MEET IR. TS. MOHAMMAD NOR AZIZ BIN M. TAIFOR

Ir. Ts. Mohammad Nor Aziz bin M.Taifor, born on 12 October 1976, graduated from B.Eng. (Mechanical) Universiti Malaya (1999) and MBA Universiti Utara Malaysia (2016) is a professional engineer with over 25 years of experience in the power generation and energy sector, specializing in business development, contract management, and technical operations.

Starting his journey as a mechanical engineer, Mohammad Nor Aziz quickly proved himself as more than just a technical expert. At TNB Repair and Maintenance (REMACO), he mastered the art of precision in generator overhauls, inspections, and maintenance—work where safety, efficiency, and accuracy were non-negotiable. But for Aziz, technical expertise was only the beginning. With determination and vision, he steadily rose through the ranks, taking on roles that stretched from Technical Manager to Maintenance Manager in Pakistan, then Contract Performance Manager, and later Senior Manager for Projects & Marketing. Each step reflected not just career advancement, but a readiness to embrace challenges on both local and international fronts.

Today, as Senior Manager, Business Development & Marketing at TNB Power Generation Sdn. Bhd., Mohammad Nor Aziz is shaping the company's future by exploring new markets, securing strategic partnerships, and driving responsible growth that balances profitability with sustainability. His portfolio is impressive with multimillion-ringgit projects, long-term service agreements with Petronas, Sabah Electricity, and international partners, and oversight of critical power plant operations.

Yet, beyond the technical and business milestones, Mohammad Nor Aziz's leadership is defined by something deeper i.e. his commitment to people.

Known as a mentor and motivator, he believes leadership means creating opportunities for others to grow. This passion extends well beyond the workplace. As an industrial advisor to Universiti UTHM (2018–2020) and University of Wollongong (UOW) Malaysia KDU (2023–2025), he helps prepare the next generation of engineers.

As Yang Dipertua PIBG at SMK Seksyen 16, Shah Alam, he contributes to strengthening education at the community level. Balancing a demanding career with family life, Aziz is also a proud husband and father of six.



Senior Manager
Business Development & Marketing
TNB Power Generation Sdn. Bhd

In his own way, Ir. Ts. Mohammad Nor Aziz is proof that powering the nation is not just about turbines and grids, but it's about building futures, fostering talent, and ensuring that progress remains sustainable for generations to come.

7.0 Upcoming Events



Online National Urban Traffic Innovation Challenge 2025

Objective : To develop innovative and practical solutions to solve urban traffic problems

COMPETITION ENTRY & GENERAL RULES

1. The infographic poster competition is open to any students from any public/private university/college in Malaysia. The participating students must provide their student ID or any student proof.
2. The registration form can be filled out through this link: <https://forms.gle/EtZe3qfMzD6ZdWk9>
3. The poster submission deadline is **15th November 2025**.
4. By entering the competition, the entrants agree to grant permission to Universiti Malaya (UM) and IATSS Forum Japan National Committee Malaysia (NC) to use and reproduce their work, with appropriate acknowledgement.
5. Each entry can be participated and submitted by a team consisting of 2 to 4 students. Maximum number of members in each group is 4.
6. There is no limit to the number of entries any group can submit. A group can submit as many entries as they wish. Each submission is required to fill out a separate registration form.
7. Infographic poster entries should be in high resolution graphic or pdf format, with A1 size dimensions 594 mm x 841 mm (Portrait) or 841 mm x 594 mm (Landscape). Maximum file size is 10MBs.
8. A short description (200-300 words) of the infographic poster with the entry is required.
9. All entries shall be in English.
10. Please ensure that all images are available under a creative commons license or permission has been obtained.
11. The top five teams will be notified by email and invited to present their works and ideas to the judges in the final round which will be held in Universiti Malaya on **13th December 2025**.

Top 5 winners shall receive:

Gold ✓ RM 1000 + trophy

Silver ✓ RM 900 + trophy

Bronze ✓ RM 800 + trophy

Excellence award x 2 ✓ RM 500

- ❖ All participants with entries accepted by competition secretariat will receive an e-certificate of participation.
- ❖ Participants with multiple entries will receive only one e-certificate of participation.

**Submission Deadline:
15th November 2025**

TOPIC & RESOURCES

The theme of the infographic poster competition is **"Urban Traffic Problem and Solutions"**. The participants shall consider general urban traffic issue which includes, but not limited to, road safety, traffic congestion, pollution due to traffic, and others.

There is no limitation on the number of issues and solutions proposed by each team. You can either focus on one issue and proposed solutions, or present a few issues and solutions in the infographic poster.

JUDGING CRITERIA

In this competition, the judges will evaluate the entries based on the following criteria:

- ✱ Relevance and accuracy of information and content of the issues/problems [25%]
- ✱ Scalability, feasibility and impact potential of the proposed solutions [25%]
- ✱ Effective communication of information [15%]
- ✱ Clarity of information for non-technical public [10%]
- ✱ Visual appeal [10%]
- ✱ Creativity [10%]
- ✱ Grammar and Spelling [5%]

IMPORTANT NOTE

INTELLECTUAL PROPERTY: In submitting your infographic poster entry to Online National Urban Traffic Innovation Challenge 2025, you would have declared that the infographic poster being submitted is your own work, and all sources of reference are acknowledged in full; you would have also certified that all images in infographic poster are either available under a creative commons license or permission has been obtained.

In submitting your infographic poster entry to the competition, you grant to UM & IATSS Forum Japan National Committee Malaysia (NC) an irrevocable, perpetual and royalty-free right to use, reproduce, edit, display, transmit, prepare derivative work, modify, publish and otherwise make use of the submitted work or other information in any and all media, whether now known or hereinafter created, throughout the World and for any purpose, in addition to the right to resize, crop, censor, compress, edit, feature, caption, affix logos to, and otherwise alter or make use of the submitted work.

For any inquiry, kindly contact

**UM and IATSS Forum Japan Malaysian
Secretariat**

✉ ctrum@um.edu.my

✉ yuencw@um.edu.my

☎ 03 7967 5339 / 5355



Organised by :
IATSS Forum Japan National Committee Malaysia (NC)
Centre for Transportation Research UM, Dept. of Civil Engineering
UM & UM Smart Mobility CoE





LATSS FORUM
Leadership Development Program in Japan



**UNIVERSITI
MALAYA**

URBAN MOBILITY TECHNICAL SEMINAR

PROGRAM ITINERARY
Saturday
13th December 2025
Universiti Malaysia

TIME	ACTIVITIES
10:30 am	Arrival and registration of finalists and judges
11:00 am	Final Judging (10 minutes presentation for each team)
12:30 pm	Lunch for judges and finalists
2:00 pm	Arrival and registration of seminar participants
2:30 pm	Welcoming Speech by Dato' Zuraidah Atan Chairman of IATSS Forum Japan National Committee Malaysia
2:40 pm	Urban Mobility Technical Seminar (20 minutes for each speaker) Speaker #1: Ms Linza Wells, MSc, FCIHT, TPS Executive Director at MDS Traffic Planners & Consultants Topic: "Transforming Mobility: Designing Streets for the Future of Active and Sustainable Travel" Speaker #2: Associate Professor Dr. Zulkhairul Naim Sidek Ahmad AP of Global and Planetary Health and Head of the Medical Education Department at the Universiti Malaysia Sabah (UMS) Topic: "From Traffic to Wellbeing: Public Health Perspectives on Smart Mobility" Speaker #3: MIROS Topic: tbc
4:00 pm	Closing Speech : His Excellency Noriyuki SHIKATA Ambassador of Japan to Malaysia Topic: "Urban Mobility: How micro-mobility could be the solutions to First Mile-Last Mile (FM-LM) travel challenges in urban areas (tbc)" Prize giving ceremony Group Photos
4:30 pm	End of event (Tea reception for VIP and speakers)

Organised by
IATSS Forum Japan National Committee Malaysia (NC)
Centre for Transportation Research UM, Dept. of Civil Engineering UM & UM Smart Mobility CoE

Call for Papers: Inaugural Issue of the International Journal of Advanced Manufacturing and Material Processing (IJAMMP)

The editorial office of IJAMMP is pleased to announce that we are now accepting submissions for our inaugural issue, which will highlight pioneering research and perspectives in the fields of manufacturing technologies and material processing.

We invite researchers, practitioners, and scholars to contribute original research articles, comprehensive reviews, mini reviews, and other scholarly works for consideration. Submissions received by 31st October 2025 will undergo peer review for inclusion in the inaugural issue, scheduled for publication in December 2025.

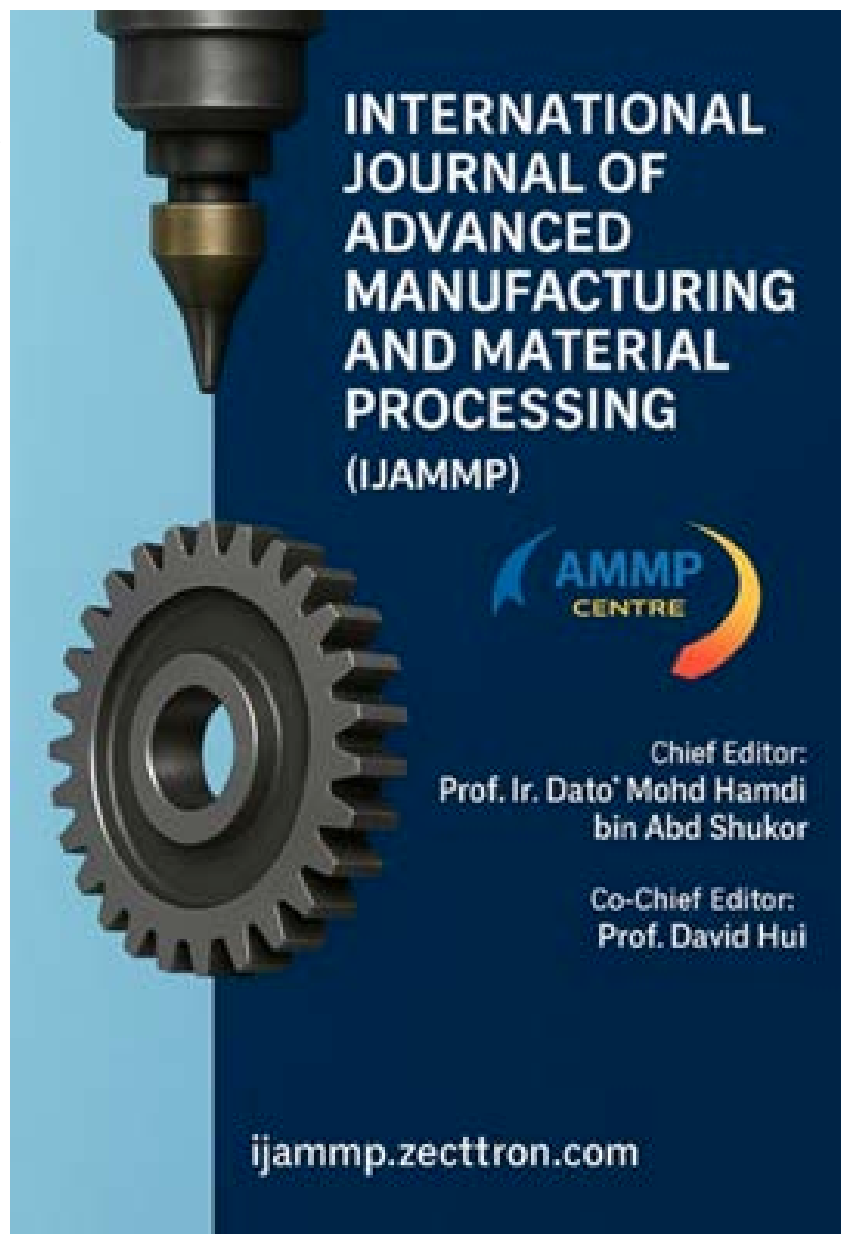
Key Highlights

- No article processing charges (APCs) for the inaugural issue
- Open access platform to ensure global reach and visibility of your research
- Wide scope covering advanced manufacturing technologies, material innovation, and processing techniques

Submission Information

Manuscript template and guidelines are available on our website:
<https://ijammp.zecttron.com/>

By:
Dr. Mohd Fadzil bin Jamaludin
AMMP Centre



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ABOUT ENGINITIUM

Enginitium is the quarterly bulletin published by the Research Office at the Faculty of Engineering, Universiti Malaya.

Its mission is to celebrate the achievements of our faculty members, particularly focusing on their research initiatives and contributions to knowledge and society.

This publication seeks to foster a vibrant culture of knowledge sharing and collaboration within our academic community.

Through Enginitium, we aspire to inspire and inform, showcasing the impactful work being conducted at the Faculty of Engineering, Universiti Malaya.

CALL FOR SUBMISSIONS

We invite all members of the Faculty of Engineering, UM to contribute to Enginitium. Whether you have a research article, thoughts on recent developments in engineering, or updates about activities within your research team, we would love to feature your work. Your contributions will not only enrich our bulletin but also inspire and inform fellow researchers and practitioners. Please submit your articles and updates via email to: fk_tdr@um.edu.my

We look forward to your valuable contributions!

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Thank You



*Home of the Bright, Land of the Brave
Di sini Bermulanya Pintar, Tanah Tumpahnya Berani*

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