Universiti Malaya Civil Engineering Competition(UMCvEC)

HANDBOOK

Welcome to UMCvEC 2025

EnviroBowl Concrete

DATE : 19th April 2025

TIME : 7.00 AM - 5.30 PM

VENUE: Faculty of Engineering, Universiti Malaya

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INTRODUCTION TO UMCvEC 2025

The Universiti Malaya Civil Engineering Competition (UMCvEC) is an annual competition **organized by the Universiti Malaya Department of Civil Engineering.**

Building on the enthusiasm and growing number of participants from past events, we are proud to continue organizing this prestigious competition each year. Since 2017, UMCvEC has fostered collaboration, challenged conventional practices, and driven forward the future of eco-conscious construction.

This year, we are excited to carry forward our commitment to sustainability and engineering excellence. As we proudly uphold the tradition and focus of **our flagship competition: Concrete Bowling**—a platform that challenges creativity, technical skills, and sustainable practices in concrete design.

UMCvEC 2025 celebrates the **200th anniversary of Portland cement**, reflecting on its significance in construction while encouraging the pursuit of eco-friendly alternatives. In line with this milestone, we introduce this year's theme: **EnviroBowl Concrete**, emphasizing green technology and the integration of environmentally friendly binders in concrete mixtures. As the industry shifts toward sustainability, the competition serves as a **platform for innovative solutions that balance durability, efficiency, and environmental responsibility.** Through sustainable materials and cutting-edge approaches, we aim to inspire the next generation of engineers to push the boundaries of eco-conscious construction.

MESSAGE FROM THE DEAN OF FACULTY & DIRECTOR

The Dean of Engineering Faculty

On behalf of the faculty, I am excited to invite you to the Universiti Malaya Civil Engineering Competition 2025 (UMCvEC 2025). This event highlights the fusion of innovation and practical application in civil engineering. Participants will have the challenge of designing and constructing bowling balls using concrete, showcasing both their theoretical knowledge and practical skills. As you engage in this exciting project, remember that each step is an opportunity for growth and innovation. Let us unite to celebrate the foundational principles of Civil Engineering while promoting collaboration and striving for excellence.

Prof.Ir.Dr.Nik Nazri Nik Ghazali

Ms. Boo Xin Ni

Director of UMCvEC 2025

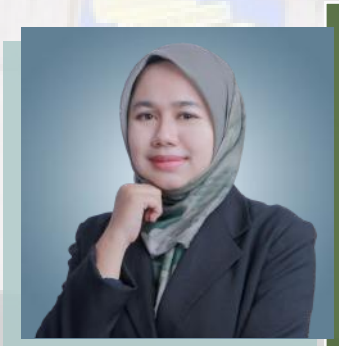
It is my pleasure to welcome all participants on behalf of the organizing committee and wish you the best of luck. As the director, I would like to express my sincere gratitude to our advisors for their invaluable support and guidance, as well as to all committee members for their dedication and hard work in making this event possible. Your commitment to excellence and attention to detail have been instrumental in ensuring our success. Thank you for your contributions.

JUDGES INTRODUCTION

PROFESSOR IR MO KIM HUNG

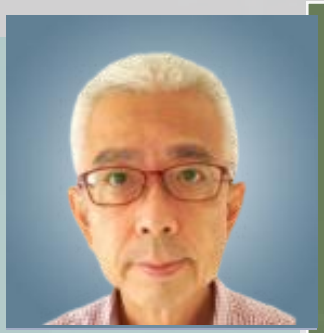
Professor at Sunway University's School of Engineering.
• PhD from Universiti Malaya in structural engineering and materials.
• Professional Engineer registered with the Board of Engineers Malaysia.
• Specializes in concrete materials technology, advocating for green and low carbon cement and concrete.
• Over 100 publications in journals and RM 1.0 million in research funding.
• Actively engages with local and international engineering communities, contributing to international conferences and student competitions.

TS. NURSYUHADA BINTI CHE HUSSAIN



Technical Manager at YTL Cement's Construction Development Lab
• Bachelor's degree in Chemical Engineering from UiTM.
• 10 years of experience in concrete industry.
• Oversees quality control and research for materials and technologies.
• Maintains direct communication with production team, sales department, and clients.
• Involved in significant projects in Kuala Lumpur. (The Exchange 106, SUKE highway, DASH Highway, MRT 2, LRT 3 and many more.)

MR. GAN CHENG CHIAN



Civil Engineer with 36 Years Experience
• B. Eng. from National University of Singapore.
• Member of SS674-2021 Working Group since 2019.
• Domain Expert for Sprayed Concrete and Fibre Reinforced Concrete under Intelligent National Productivity and Quality Specification Singapore.
• Involved in over 22 sprayed fibre concrete tunnel linings and precast segmental and cast concrete tunnel lining projects.

PN. SALWATI MOHD SUKRI

Head of QA/QC at Unipati Concrete Sdn Bhd
• Holds a Bachelor's Degree in Civil Engineering from UiTM
• 13 years of expertise in concrete mix optimization, quality assurance, and R&D.
• Developed concrete solutions, including low-carbon, ultra-high strength concrete.
• Certified Quality Management Representative for ISO 9001:2015 and internal auditor for ISO 37001:2016.
• Collaborates on R&D initiatives with PLUS, Petronas, and Nano Malaysia.

ADVISORS OF UMCvEC 2025

ASSOCIATE PROF.
DR. TAN CHEE GHUAN
Advisors

DR. LEONG GEOK WEN
Advisors

PARTICIPANT INTRODUCTION

CEvolution
USTP CDU, Philippines

Enginuity
USTP CDU, Philippines

The RenewaBowls
Polytechnic University of the Philippines

EcoSphere Innovators
Polytechnic University of the Philippines, Manila

Civil-ians
Nanyang Technological University

PARTICIPANT INTRODUCTION

EcoCyclo-Bowl
Universiti Malaya

UM
Universiti Malaya

PutraConstella
Universiti Putra Malaysia

SustainaBOWL
Universiti Kebangsaan Malaysia

UTM Link 1
Universiti Teknologi Malaysia

Flying Durian
Universiti Teknologi Malaysia

PARTICIPANT INTRODUCTION

MonashBowl
Monash University

Monash Civil
Monash University

UNIMAP 1
Universiti Malaysia Perlis

UNIMAP 2
Universiti Malaysia Perlis

COCKLEBALL
Universiti Tun Husein Onn Malaysia

Thunderbolt
Universiti Pertahanan Nasional Malaysia

INNOVATING SUSTAINABLE CONSTRUCTION:

GFRP REBAR FOR SEA SAND AND SEAWATER CONCRETE

As the construction industry evolves to meet global sustainability goals, innovative practices are gaining traction. One such approach is the use of sea sand and seawater in concrete, which offers an environmentally friendly alternative to traditional construction materials. This method not only reduces reliance on freshwater and river sand but also contributes to more sustainable and durable marine structures.

The Need for Sustainable Solutions

The construction industry is a significant contributor to greenhouse gas emissions, accounting for approximately 37% of global emissions. As water-stressed regions face increasing challenges, the use of seawater and sea sand in concrete presents a viable alternative to traditional materials.

This shift not only reduces the environmental footprint of construction projects but also mitigates the rising costs associated with freshwater and river sand.

The Challenge of Reinforced Concrete in Marine Applications

While the integration of sea sand and seawater into concrete is a significant advancement, the true challenge lies in reinforcing this concrete effectively. Traditional steel reinforcement is prone to corrosion, especially in chloride-rich environments, which can lead to structural failures over time. Glass Fibre Reinforced Polymer (GFRP) rebar emerges as the keystone of this innovation, offering a sustainable and durable solution that outperforms conventional materials.

Cost-Effectiveness and Lifecycle Benefits

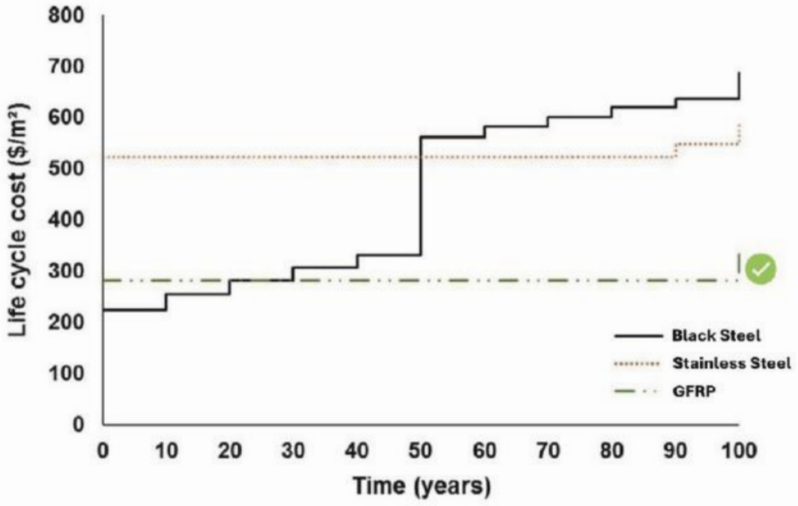
GFRP rebar not only matches the initial construction costs of traditional methods but also provides substantial lifecycle savings. Its resistance to corrosion means lower maintenance costs and longer service life, making it a more economical choice in the long run. This is particularly important in coastal regions where the harsh environment can significantly shorten the lifespan of traditional reinforced concrete.

The key ingredient in seawater concrete is the mineral admixture (granulated blast furnace slag, fly ash, or silica fume), which, when combined with lime and seawater, undergoes a reaction to create a durable and strong material. Some chemical admixtures, such as superplasticizers, can also be added to enhance the concrete properties.

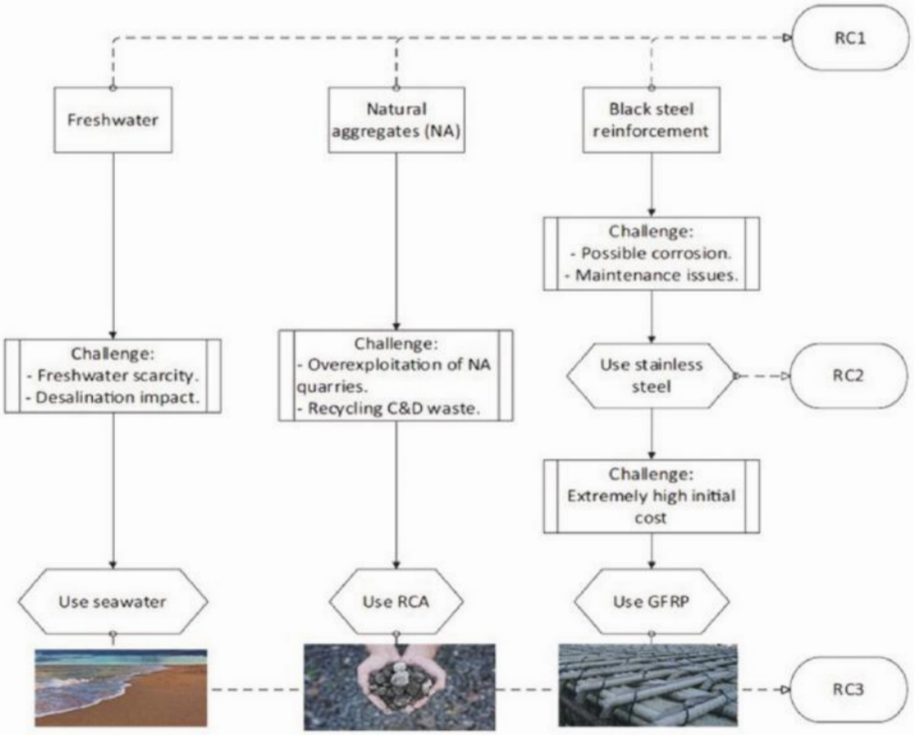
Dextra has emerged as the preferred partner to provide the needed GFRP reinforcement rebars of the sea sand and seawater concrete for the most important stakeholders who want to keep their advance in this subject. Additionally, **Dextra** ensures the highest product standards through rigorous in-house laboratory testing and a comprehensive traceability system, which is why the Hong Kong Polytechnic University has entrusted Dextra with their GFRP rebar requirements.

Antonio Nanni, Chair, American Concrete Institute (ACI) Committee 243, commends Dextra's commitment to quality GFRP manufacturing, noting that their lightweight, high-performance rebars, with a performance-to-weight ratio up to three times that of steel, are ideal for strength and sustainability.

Learn more about Dextra's GFRP rebar:
www.dextragroup.com/composite



Life cycle cost analysis of structural concrete using seawater, recycled concrete aggregate, and GFRP reinforcement - Younis, Ebead, Judd - Department of Civil and Architectural Engineering, Qatar University – Published in "Construction and Building Materials" (2018)



Flow diagram for the decision of the design alternatives

TENTATIVE

7.00 AM	Arrival & Registration of Participants
7.30 AM	Participation Booth Set-Up
8.15 AM	Opening Ceremony
9.15 AM	Booth Showcase
9.50 AM	Competition Session 1
12.30 PM	Lunch Break
1.15 PM	Competition Session 2
4.30 PM	Closing & Awards Giving Ceremony
5.30 PM	Event Dismissal

TEAM SEQUENCE

		Presentation	Strength Test	Bowling Session
9.50 AM	Competition Session 1	1	6	10
		2	7	11
		3	17	12
		4	18	13
			15	
			16	
		short break		
11.00 AM		5	10	14
		6	11	17
		7	12	18
		8	13	15
		9	14	16
			1	
12.30 PM	LUNCH BREAK			
1.15 PM	Competition Session 2	10	2	8
		11	3	9
		12	4	6
		13	5	7
		14	8	1
			9	
		short break		
2.40 PM		15		2
		16		3
		17		4
		18		5

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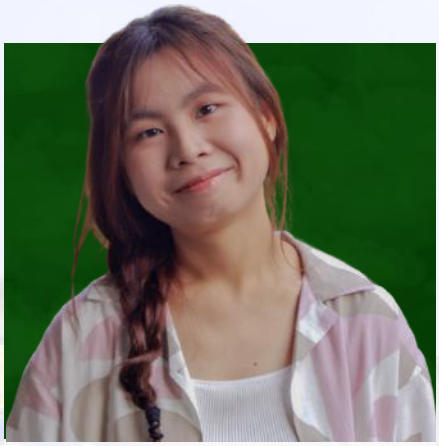
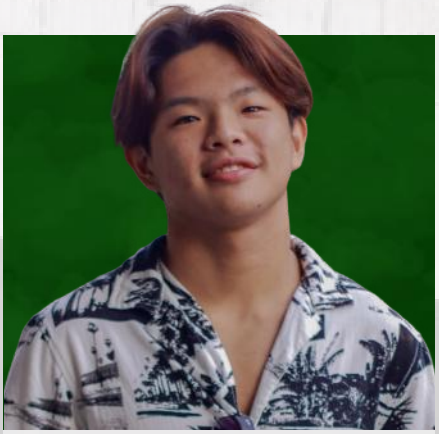


BOO XIN NI
DIRECTOR

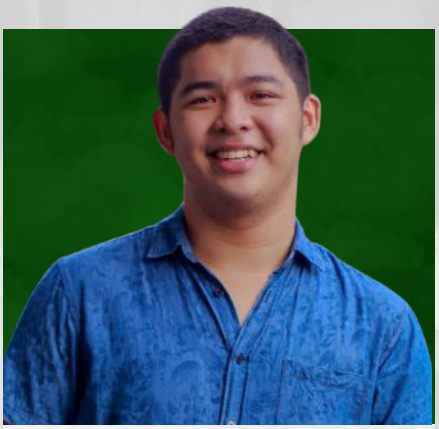
CHENG EE LINN
VICE DIRECTOR

NUR HUMAIRA BINTI HUZEIR
SECRETARY



DYLAN OOI YI YANG
TREASURER

CH'NG CHEE ENG
VICE SECRETARY



TENG CHAY KAI
VICE TREASURER

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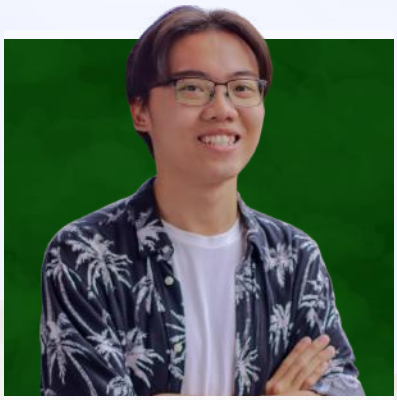
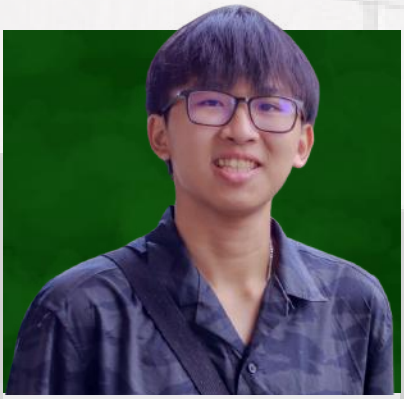
NUR AUNI HUSNA BINTI MOHD NAZREE
HOD



SAW ZHI YANG
HOD

CALVIN YEAP YONG XHEN
HOD

UMMI KALSUM BT ZAINAL SAFUAN
COMMITTEE



CHEW SHENG
COMMITTEE

AUSTIN RODFREY ELOD HIEW
COMMITTEE

JESS LU YII MING
COMMITTEE

YAP XIAO XUAN
COMMITTEE

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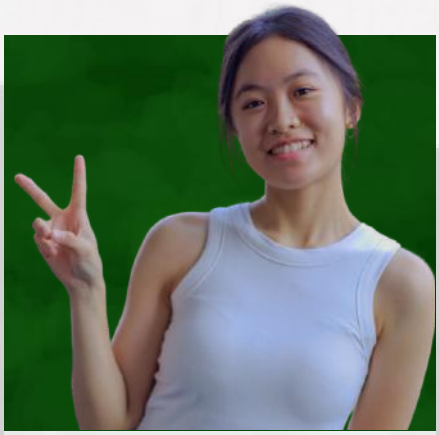
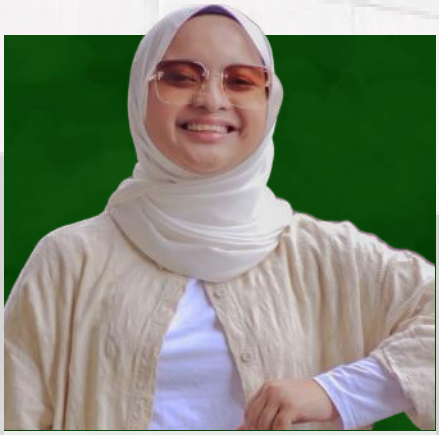
ERNESTO CHIA SOO YI
HOD

MIMI NUR SYAFIQAH BINTI SAHARUL NIZAM
HOD



LOO XIN YI
COMMITTEE



NUR ALYA BATRISYIA BT FIRUZ
COMMITTEE

LUKESH ARASU A/L THENNARASU
COMMITTEE

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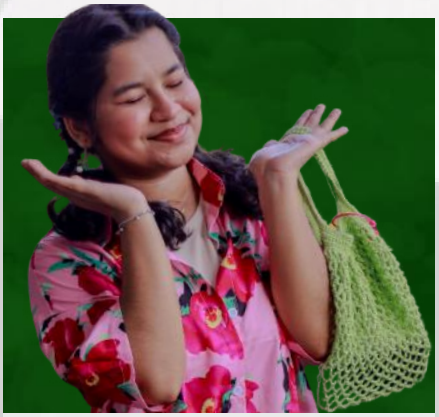
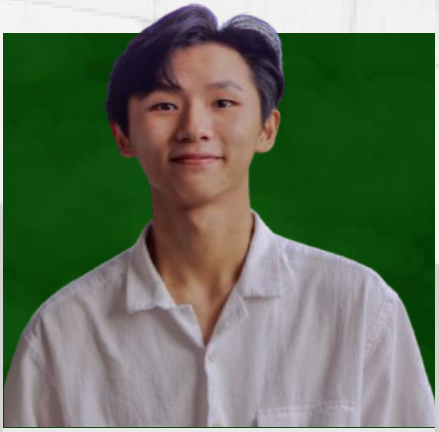
KAW YI KAI
HOD

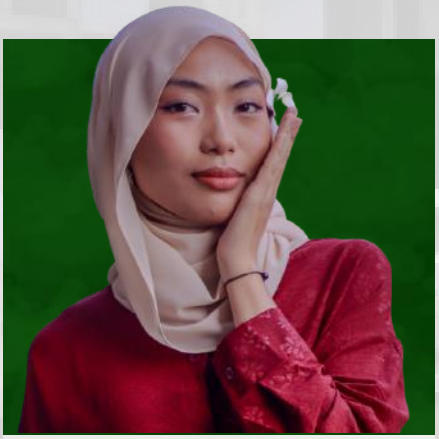
NAYLI AFRINA THURRAYA BINTI MOHD ISA
HOD



TASFIA HOSSAIN AVA
COMMITTEE



NG WEI LONG
COMMITTEE



SAFIYAH AZRIANA BINTI AZMI
POSITION

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MUHAMMAD LUQMAN HAKIM BIN MAHADI
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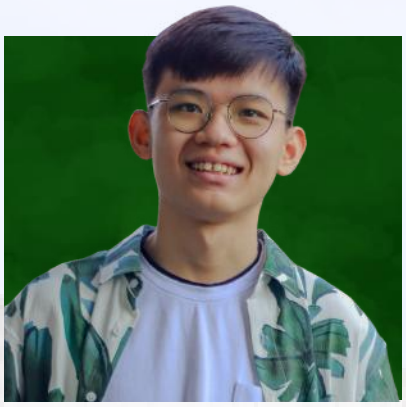
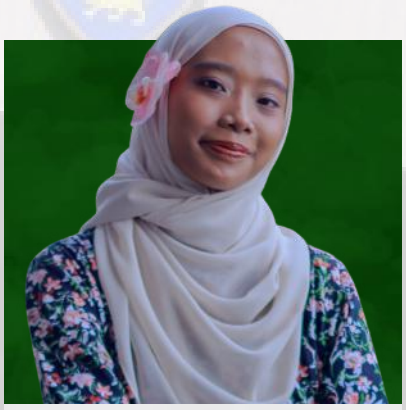
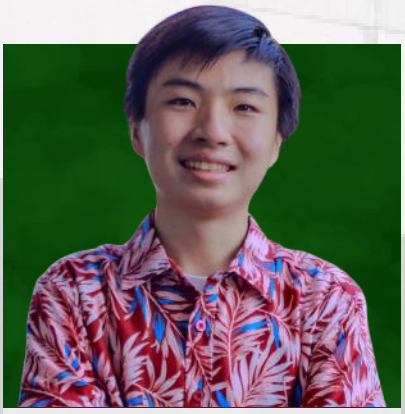


BEH YEN HIOK
HOD

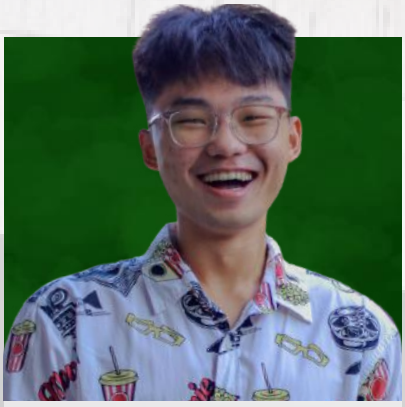
LOONG PEI LIN
HOD



NUR IRSALINA BINTI ZAKARIA
COMMITTEE

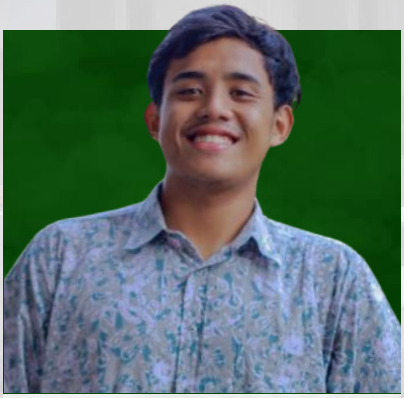


CHIN SIK WING
COMMITTEE



LIOW WEI JIE
COMMITTEE

EESON WONG ZHUANG HONG
COMMITTEE



MUHAMMAD IQRAM HAZIQ BIN SABRI
COMMITTEE

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PUBLIC RELATIONS

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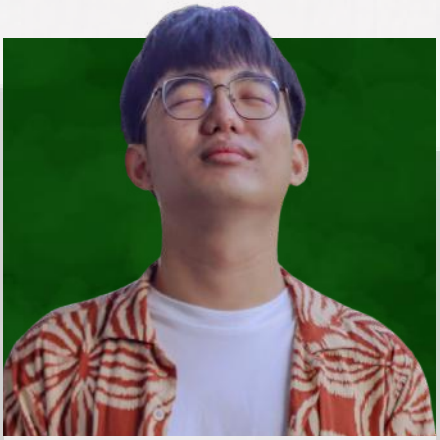
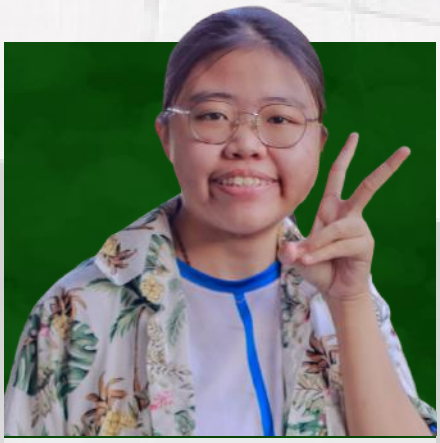
HOD

ANG JING HAO
HOD



AUGENE TENG U ZE
COMMITTEE



CHUNG JING TONG
COMMITTEE

SITI NUR AISYAH AQEELAH
COMMITTEE

UMC EC25

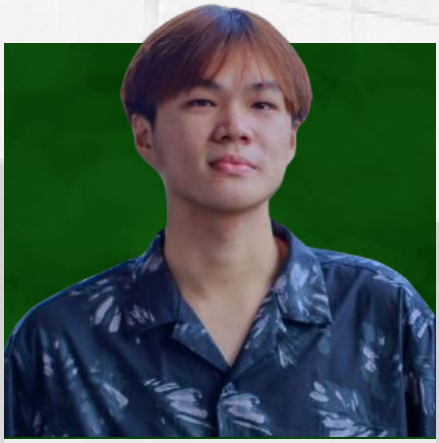
ORGANIZING COMMITEES

MULTIMEDIA

DENNIS NGIENG XUE EN
HOD

IZZNUR AKHMAR BINTI ZAMIRZAN
HOD

LIM KIAN MING
COMMITTEE



SIEW TING XIANG
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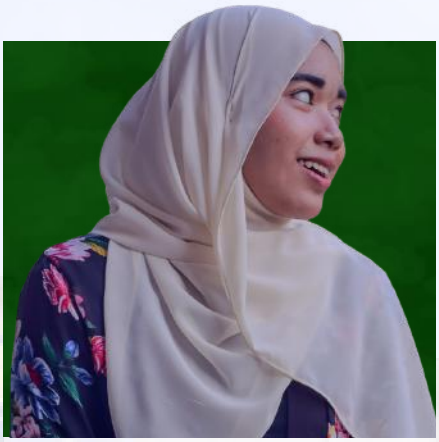
QAIRA FADILA BINTI MOHD FADZIL
COMMITTEE

ORGANIZING COMMITEES

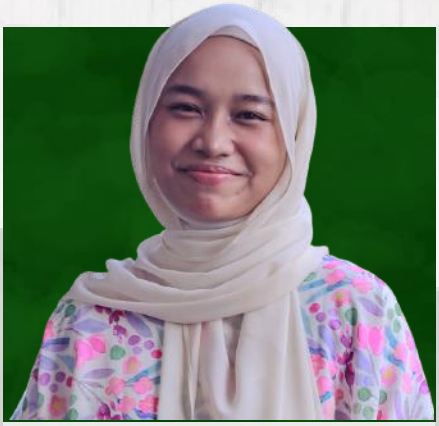
PUBLICITY



SITI ZULAIKHA BINTI SAMSUDDIN
HOD

NUR RAIHANI BINTI MOHD SALAM
HOD

JOEL ELVIRON SITORUS
COMMITTEE



NURUMAIRAH ALIAH BINTI MOHD HOSAINI
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INTERNSHIP PROGRAMME

We are proud to have hosted numerous interns!

NURTURING FUTURE TALENT

Since our inception, BS EN TEST Sdn Bhd has actively provided valuable learning opportunities for students from universities and technical institutions. Many of these interns have gone on to make significant contributions to the company, with some becoming permanent staff members.

INTERNSHIP PARTICIPATION BY UNIVERSITY/COLLEGE

UNIVERSITY / COLLEGE	YEARS OF PARTICIPATION
Kolej Kemahiran Tinggi MARA (KKTM)	2016, 2020, 2022, 2023, 2024
Universiti Kebangsaan Malaysia (UKM)	2018, 2020, 2024
Universiti Teknologi MARA (UiTM)	2019, 2022, 2023, 2024
Politeknik	2023

FOR MORE INFORMATION, CONTACT:

Mr. John Chew

johnchew.bsen@gmail.com

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Dextra

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THANK YOU
FOR JOINING US

Be sure to stay tuned on our social media platforms for further updates!

Don't hesitate to contact us at **umcvec@um.edu.my** for any inquiries.

We appreciate any valuable feedback for us to do better next time. Hope you had an impactful day, and all the best for your future endeavors.

UMCvEC25

FEEDBACK FORM

UMCvEC25's official website

IG: @umcvec