BULETIN FKA

UNIVERSITI TEKNOLOGI MARA
Cawangan Pulau Pinang
Kampus Permatang Pauh

EDISI 2024

PUSAT PENGAJIAN KEJURUTERAAN AWAM
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG

UiTM di hatiku

اوسها تقوى مولیا

Message from Ketua Pusat Pengajian

Assalamualaikum Warahmatullahi Wabarakatuh and Greetings,

Alhamdulillah, praise be to Allah SWT for granting us the strength to continue fulfilling our mission at the School of Civil Engineering, UiTM Cawangan Pulau Pinang. The year 2024 has been a journey of progress, collaboration, and shared commitment, made possible by the dedication of our lecturers, staff, and students.

This year, we have widened our horizons through meaningful collaborations with overseas universities, strengthening our academic and research networks. These partnerships provide platforms for joint research, mobility, and knowledge exchange. Our lecturers have also been active at the international level, contributing in conferences, research projects, and professional engagements. Such efforts not only enhance our visibility but also enrich the learning experience for our students.

Equally important has been the growth of our research culture. We have seen encouraging progress in publications and successful grants, reflecting the passion and perseverance of our academic community. Every achievement, whether large or small, brings us closer to our vision of shaping civil engineering knowledge that has real impact on society and the environment.

Looking ahead, our focus remains clear: to nurture graduates who are competent, ethical, and forward-looking. Civil engineering is not only about building structures but also about shaping communities and creating sustainable futures. By instilling resilience, creativity, and integrity, we prepare our students to become leaders who can respond to the challenges of a rapidly changing world.

I would like to extend my heartfelt gratitude to the editorial team of the FKAPP Bulletin for their effort in bringing together this publication. May it serve as both a record of our progress and an inspiration to all of us to continue striving with excellence.

Thank you and Wassalam.

Ts. Dr. Muhamad Faizal bin Pakir Mohamed Latiff
Ketua Pusat Pengajian
Pengajian Kejuruteraan Awam
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eISSN 2716-6325
9 772716 632004

Diterbitkan pada 25 September 2025

Kursus *Road to UiTMCPP Apple Teacher Certification*

Hazrina Ahmad, Nor Azliza Akbar, Badrul Nizam Ismail

Pada 10 September 2024, seramai 17 orang warga UiTM Cawangan Pulau Pinang (UiTMCPP) telah berjaya memperoleh pengiktirafan sebagai Apple Teacher menerusi penyertaan dalam Kursus Road to UiTMCPP Apple Teacher Certification, yang dianjurkan secara kolaboratif antara pihak Switch dan Bahagian Penyelidikan, Jaringan Industri, Alumni dan Masyarakat (PJIAM) UiTMCPP. Program ini telah berlangsung dari jam 9.00 pagi hingga 1.00 tengah hari bertempat di MIT, Switch HQ (Mainland), Bukit Mertajam, dan diwakili oleh Ts. Dr. Mohd Ikmal Fazlan Rozli bagi pihak UiTMCPP. En. Alliff Azlan, selaku Pegawai Pendidikan Switch dan Apple Professional Learning Specialist (APLS), telah mengetuai sesi pembelajaran sepanjang program.

Gambar 1: Sesi pembelajaran

Kursus ini telah memberikan pendedahan intensif melalui enam modul utama yang menumpukan kepada penggunaan aplikasi Apple dalam konteks pendidikan. Modul-modul tersebut merangkumi penggunaan iPad sebagai alat pengajaran asas, Pages untuk penghasilan bahan pengajaran, Keynote untuk persembahan interaktif, Numbers untuk analisis data pendidikan, serta iMovie dan GarageBand untuk penghasilan kandungan multimedia yang menarik. Aktiviti secara langsung ini membolehkan peserta mengaplikasikan teknologi Apple dengan lebih berkesan dalam proses pengajaran dan pembelajaran. Sesi kuiz Apple Teacher turut dijalankan sebagai penilaian akhir sebelum peserta dianugerahkan pengiktirafan rasmi.

Fakulti Pengajian Kejuruteraan Awam telah menghantar tujuh (7) orang wakil pensyarah yang bersemangat tinggi dalam meningkatkan keberkesanan kaedah pengajaran mereka melalui teknologi semasa. Penyertaan ini mencerminkan komitmen fakulti dalam memperkukuh kemahiran digital warga akademik dan menyokong usaha UiTM dalam memacu transformasi pendidikan yang lebih interaktif dan berimpak tinggi. Program seperti ini amat digalakkan untuk diteruskan bagi memperluas pembangunan profesional staf akademik pada masa hadapan.

Gambar 2: Peserta Pengajian Kejuruteraan Awam UiTMCPP

Workshop on Open Ended Laboratory (OEL) and Tips for Laboratory Report Writing

Juliana Idrus and Noraziyan Abd Aziz

On March 29, 2024, from 3.00 PM to 5.00 PM, all students of CEEC110 (Diploma in Civil Engineering) took part in an insightful online workshop titled *"Open Ended Laboratory (OEL) and Tips for Laboratory Report Writing"*. Organized by the OEL Unit, Civil Engineering Studies, UiTM Cawangan Pulau Pinang, the session aimed to deepen students' understanding of the OEL approach while equipping them with essential skills for effective scientific reporting.

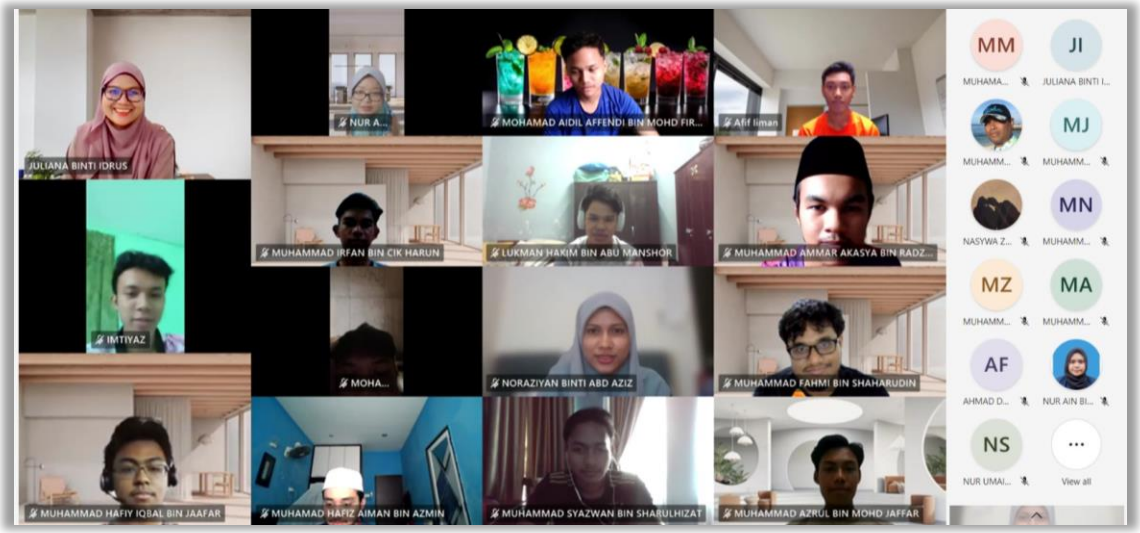
The workshop started with an overview of the Open Ended Laboratory (OEL) concept, highlighting its significance in encouraging critical thinking, problem-solving abilities, and independent learning. Unlike traditional lab sessions that follow a fixed procedure, OEL empowers students to explore diverse methodologies, examine real-world applications, and propose innovative solutions.

Following the introductory segment, participants were guided through best practices for writing clear, structured, and impactful laboratory reports. Key points covered included:

- Structuring reports with a clear flow: introduction, methodology, results, discussion, and conclusion
- Presenting data effectively through tables, graphs, and illustrations
- Ensuring clarity and precision in findings
- Avoiding common mistakes, disorganized content, and improper referencing

The session concluded with an engaging Q&A session, where students asked thoughtful questions on applying OEL strategies and refining their report-writing techniques. The OEL Unit expressed appreciation for the student's active participation and encouraged them to implement the insights gained in their future laboratory work.

Overall, the workshop was a highly beneficial learning experience, strengthening students' competencies in both their lab skills and report writing. The OEL Unit looks forward to organizing more such initiatives to continue fostering academic excellence and hands-on learning.



A wonderful end to a session full of learning and sharing. Well done, everyone!

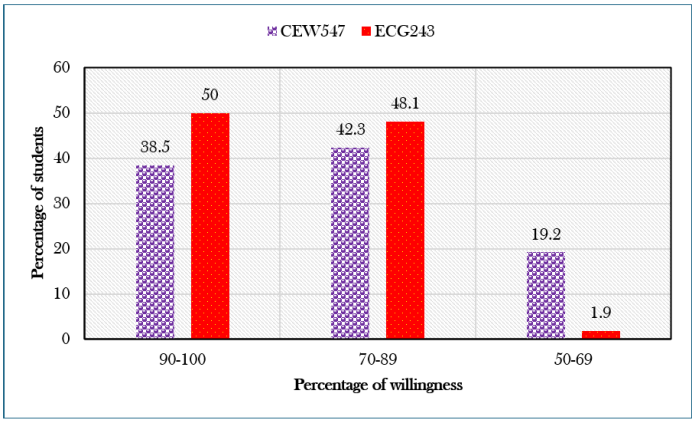
Before It Begins: Measuring Students' Willingness to Participate in PO Intervention & Cantas Gagal

Assoc. Prof. Dr. Noorsuhada Md Nor, Roziah Keria, Dr. Intan Shafeenar Ahmad Mohtar

This information provides insight into the estimated willingness of students to participate in the PO Intervention & Cantas Gagal programme before they actually participate. By comparing the responses from two different groups, we hope to better understand students' initial perceptions, interest and potential factors influencing their motivation to participate in the programme in the future.

The graph below shows that students estimated their readiness to participate in the PO Intervention & Cantas Gagal programme prior to actual participation, comparing two groups: CEW547 and ECG243. ECG243 students generally showed higher readiness. About 50% estimated their participation at 90–100%, compared to about 38% of CEW547 students. At the same time, there were quite a large number of students in the 70–89% range in both groups, indicating moderate interest and openness to the programme.

Interestingly, in CEW547, a considerable proportion of students (approximately 20%) were in the lower 50–69% readiness range, indicating some uncertainty or hesitation before participating. In contrast, ECG243 had very few students in this lower range, indicating greater initial confidence or curiosity about the programme. Overall, ECG243 students appeared to be more motivated to participate in the programme, whereas initial interest was more mixed in CEW547. The higher willingness of ECG243 students to participate in the PO Intervention & Cantas Gagal programme could be due to the fact that they were familiar with similar programmes in their academic background. This may have led them to feel more confident and better prepared, resulting in greater interest. In contrast, the CEW547 students may have had less information or previous experience, which could explain why more of them were initially hesitant or unsure about participating.



Another possible reason is social influence. The ECG243 students may have received positive feedback from peers or seniors who had already participated in the programme, creating a sense of confidence and enthusiasm. They may also have seen the programme as more relevant to their academic or personal goals. The CEW547 students, on the other hand, may not have had the same experience or encouragement, which often affects motivation and perceived value before participating in something new.

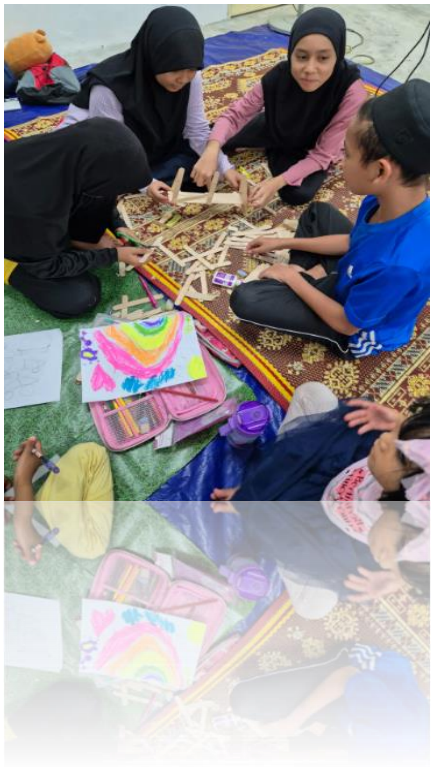
To increase awareness of the PO Intervention & Cantas Gagal programme, lecturers can begin by sharing real-life stories and positive outcomes from previous participants. When students hear how other participants have gained confidence, experienced personal growth, they are more likely to see the programme as valuable. Faculty can also highlight how the programme aligns with academic or career goals, making it more relevant and appealing to students.

Pemerkasaan Komuniti Menerusi Kejuruteraan Awam: Bridge Competition for Kids

Nor Hafizah Hanis Abdullah, Zanariah Abd Rahman, Adhilla Ainun Musir, Nurulzatushima Abd Karim, Fairus Azwan Azizan, Afifuddin Habulat, Syahirah Mansor, Fuziatul Norsyiha Ahmad Syukri

Pepatah “melentur buluh biarlah dari rebungnya” menggambarkan dengan tepat tujuan program pemerkasaan komuniti yang dianjurkan oleh Fakulti Kejuruteraan Awam (FKA) dari Universiti Teknologi MARA Cawangan Pulau Pinang (UiTMCPP). Program yang dinamakan "Bridge Competition for Kids" ini merupakan hasil jalinan kerjasama antara FKA dan penduduk Taman Mengkuang Heights (TMH) di Bukit Mertajam. Bertempat di Dewan Serbaguna TMH pada 24 Februari 2024, program ini bertujuan untuk memperkenalkan kanak-kanak kepada asas-asas kejuruteraan awam, khususnya dalam pembinaan jambatan. Secara tidak langsung, aktiviti ini memberi pendedahan awal kepada mereka tentang kepentingan kejuruteraan dalam pembangunan negara.

Sebanyak 25 kanak-kanak yang berusia antara 6 hingga 15 tahun telah menyertai program ini, dan mereka dibahagikan kepada beberapa kumpulan kecil. Acara dimulakan pada jam 8.30 malam, setelah para peserta menikmati jamuan makan malam yang disediakan oleh penganjur. Pada permulaan program, fasilitator yang terdiri daripada pensyarah FKA memberikan penerangan tentang asas-asas mereka bentuk struktur jambatan. Selepas itu, kanak-kanak ini menggunakan alat tulis masing-masing untuk membuat lakaran idea di atas kertas yang disediakan. Kesungguhan dan kreativiti mereka jelas terpancar ketika melontarkan idea dan membincangkan reka bentuk jambatan yang akan dibina. Dalam proses ini, bakat kepimpinan dan kerjasama mereka turut terserlah.



Langkah seterusnya adalah membina model prototaip jambatan berdasarkan reka bentuk yang telah dipilih. Dengan menggunakan bahan-bahan seperti 100 keping batang aiskrim, kertas, gam, dan gunting, kanak-kanak ini bekerjasama dalam kumpulan masing-masing untuk menyiapkan prototaip jambatan mereka. Semangat berpasukan dan disiplin pengurusan masa turut diterapkan dalam pertandingan ini, di mana 30 minit pertama diperuntukkan untuk lakaran idea, dan 60 minit seterusnya untuk menyiapkan prototaip. Seusai 90 minit, sesi perjurian diadakan dengan juri jemputan yang dilantik terdiri daripada Ahli Jawatankuasa TMH. Terdapat empat kategori yang dinilai: kestabilan, kreativiti, kekemasan, dan kesepaduan.

Walaupun menjadi juara bukanlah keutamaan, pengalaman berharga yang diperolehi sepanjang program adalah yang paling penting. Ini termasuk menimba ilmu baharu, memupuk semangat berpasukan dan kepimpinan, serta mencungkil bakat dalam reka bentuk. Di penghujung program, para peserta disajikan dengan aktiviti membakar marshmallow di atas unggun api. Kegembiraan dan kepuasan jelas terpancar di wajah mereka setelah bertungkus-lumus menyiapkan tugasan pembinaan jambatan. Bagi pihak FKA, penganjuran program seperti ini dapat memperkenalkan ilmu kejuruteraan awam kepada masyarakat sekitar secara khusus dan UiTMCPP secara amnya.

Dengan program "Bridge Competition for Kids", FKA berharap dapat menyemai minat awal terhadap bidang kejuruteraan di kalangan generasi muda, sekaligus melahirkan bakat-bakat baharu yang mampu menyumbang kepada pembangunan negara di masa hadapan. Program ini bukan sahaja mendedahkan kanak-kanak kepada dunia kejuruteraan tetapi juga membina asas kepimpinan dan kerjasama yang kukuh dalam diri mereka. Semoga program seumpama ini dapat diteruskan dan diperluaskan pada masa akan datang untuk manfaat lebih ramai kanak-kanak dan komuniti setempat.

The 2nd Repair and Retrofit Reinforced Concrete Beam (3RCB) Workshop 2024 : See the defect

Afifudin Habulat, Hazrina Ahmad, Syahirah Mansor, Zul Azmi Mohtar, Soffian Noor Mat Saliah

The 2nd Repair and Retrofit Reinforced Concrete Beam (3RCB) Workshop 2024 was organised by Pengajian Kejuruteraan Awam, Universiti Teknologi MARA (UiTM) Cawangan, Pulau Pinang, in Jun 2024. The workshop aims to provide insight into the repair and retrofit of reinforced concrete (RC) structure, particularly beams. This workshop also involved the industry by having a sharing session from Encik Hussin Mohammad from Jambatan Kedua Sdn. Bhd. (JKSB) as the industrial speaker. Encik Hussin shared his on-site experiences on the current repair and retrofit technique particularly for bridge structures that is exposed to the salted water. He also detailed out about choosing the correct technique considering the economic factors as well.

In this workshop, reinforced concrete beams were prepared in order to educate the students on the strength capacity and the performance of the beams, with and without defects. The strength test using the 1000 kN reaction frame was carried out to allow the students to experience and understand on the behaviour of a defected RC beam in comparison to a normal RC beam. Earlier, the students prepared the pre-cracked RC beam and chose the best retrofit technique to improve the capacity of the pre-cracked RC beam. The comparisons were made and tabulated in complete report. To summarise, the workshop was a success, and this 3RCB workshop should be continued in the future to enhance their knowledge beyond the university classroom.

Figure 1 : Defected RC Beam

Figure 2 : Normal RC beam

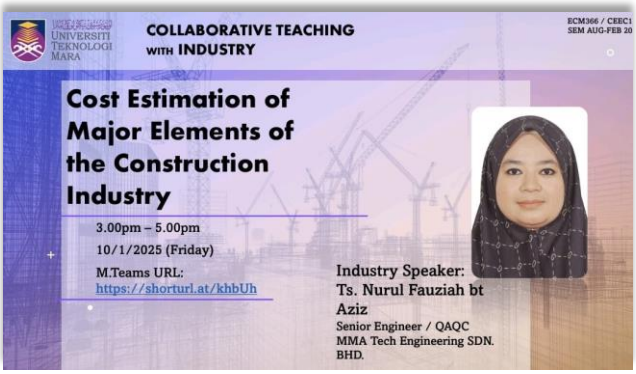
Figure 3 : Retrofitted RC beam with CFRP

Figure 4: The organisers, speaker and participants

Kolaborasi Akademia & Industri:
Perspektif Profesional dalam Estimasi Kos Pembinaan

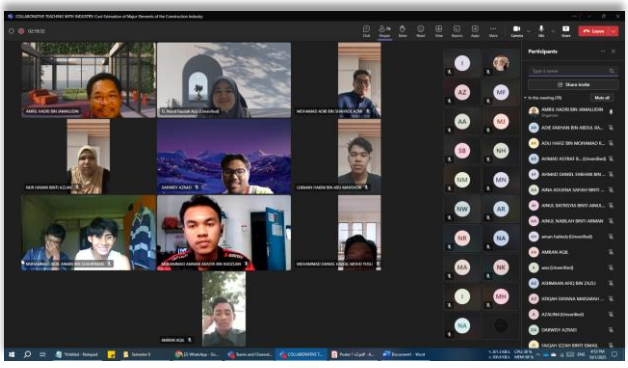
Nurulzatushima Binti Abdul Karim,Nor Janna Bt Tammy, Adhilla Bt Ainun musir, Amril Hadri Bin Jamaluddin

Pada 10 Januari 2025, satu sesi Collaborative Teaching telah berjaya dianjurkan bagi subjek ECM366 – Civil Engineering Quantities and Estimation dengan tajuk "Cost Estimation of Major Elements of the Construction Industry". Program ini telah dijalankan secara dalam talian melalui platform Microsoft Teams dari jam 3.00 petang hingga 5.00 petang, dan mendapat sambutan yang sangat menggalakkan dengan kehadiran seramai 140 orang pelajar daripada UiTM Cawangan Pulau Pinang dan UiTM Cawangan Jengka, Pahang.



Penceramah jemputan bagi sesi ini ialah Ts. Nurul Fauziah binti Aziz, seorang Senior Engineer di MMA Tech Engineering Sdn. Bhd. yang mempunyai pengalaman luas dalam industri pembinaan, khususnya dalam bidang anggaran kos dan kuantiti kerja kejuruteraan awam.

Program ini bertujuan untuk memperkukuh kefahaman pelajar terhadap proses dan teknik sebenar dalam penyediaan anggaran kos bagi elemen utama pembinaan. Selain itu, ia juga memberikan peluang kepada pelajar untuk memahami cabaran yang dihadapi oleh jurutera di lapangan serta mendedahkan mereka kepada keperluan industri yang sebenar.



Dalam sesi perkongsian tersebut, Ts. Nurul Fauziah telah membincangkan pelbagai aspek penting berkaitan anggaran kos, termasuklah penyediaan dokumen anggaran, kaedah pengiraan kos untuk elemen-elemen seperti kerja tanah, struktur konkrit, kemasan dalaman, serta sistem mekanikal dan elektrikal. Beliau juga berkongsi contoh sebenar daripada pengalaman kerjaya beliau, serta menekankan kepentingan ketepatan data dan komunikasi berkesan antara pihak-pihak yang terlibat dalam projek pembinaan.

Sesi soal jawab yang dijalankan pada akhir program memperlihatkan tahap minat dan penglibatan aktif pelajar yang tinggi. Pelajar mengambil peluang ini untuk bertanya soalan dan mendapatkan pandangan lanjut daripada penceramah mengenai kerjaya dalam bidang anggaran dan pengurusan kos.

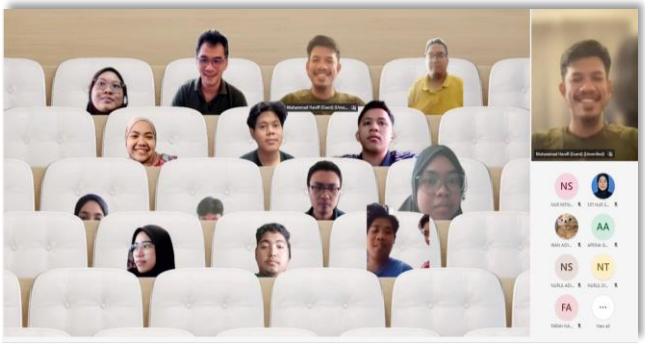
Secara keseluruhannya, program ini telah berjaya mencapai objektifnya dalam memberikan pendedahan industri yang bermakna kepada para pelajar. Kolaborasi antara pihak akademik dan industri seperti ini amat penting dalam melahirkan graduan yang kompeten, berdaya saing, dan bersedia untuk menyumbang dalam sektor pembinaan negara.

Collaborative Teaching Project:
Innovative Water Resource Technologies for Sustainable Paddy Cultivation

Kuan Woei Keong, Nur Azwa Muhamad Bashar and Intan Shafeenar Ahmad Mohtar

As part of a collaborative teaching program aimed at enhancing knowledge of students in line with developments in the industrial sector, *Mr. Muhammad Haniff Bin Ahmad*—Research Officer at the Engineering Research Center, Malaysian Agricultural Research and Development Institute (MARDI) was invited to deliver a compelling online lecture on 6th December 2024 titled *"Innovative Water Resource Technologies for Sustainable Paddy Cultivation".* The lecture explored advancements in water resource technologies for sustainable agriculture, particularly in the face of climate change in Malaysia.

Mr. Haniff began by highlighting the growing vulnerability of Malaysia's agricultural sector to climate change. Future climate projections suggest increased variability in rainfall patterns, prolonged dry spells, and rising sea levels—all of which pose significant threats to paddy field irrigation. Saline water intrusion into coastal irrigation networks is becoming more frequent, compromising soil health and crop yields. In response, researchers are exploring the viability of cultivating hilly paddy, which are more resilient to water stress and can thrive in elevated terrains with alternative irrigation strategies.



To address these challenges, Mr. Haniff introduced a suite of alternative water resource technologies aimed at reducing dependency on conventional irrigation system that rely on surface water. These include:

- **Water Recycling Systems** (Pond Storage): By capturing excess irrigation runoff and rainwater into dedicated storage ponds, farmers can reuse water during dry periods. Research conducted by Mr Haniff demonstrated that water savings was up to 32%, with improved irrigation efficiency and reduced environmental impact.
- **Drainage Recovery Systems**: These systems intercept and treat agricultural drainage water, allowing it to be reused for irrigation. This not only conserves water but also minimizes nutrient loss and pollution.
- **Shallow Groundwater Wells**: In regions with suitable aquifers, shallow wells offer a reliable backup source during dry seasons. Proper monitoring ensures sustainable extraction without depleting local water tables.
- **IoT-Based Irrigation Monitoring**: Mr. Haniff emphasized the role of smart technologies in modern agriculture. IoT sensors can track soil moisture, weather conditions, and water flow in real time, enabling precise irrigation scheduling and reducing waste.

The session was part of a broader effort to bridge academic learning with industrial practice. Students were exposed to real-world applications of hydrological engineering principles, including system design, water budgeting, and sustainability assessment. Mr. Haniff's insights encouraged students to think critically about the intersection of engineering, environmental stewardship, and food security.

In closing, Mr. Haniff stressed that sustainable cultivation is not merely a technical challenge but a societal imperative. By integrating innovative water resource technologies and adapting to climate realities, Malaysia can safeguard its paddy production while nurturing a new generation of engineers equipped to lead the transformation.

Rethinking Urban Mobility: Moving People, Not Just Cars

Li-Sian Tey, Zanariah Abd Rahman, Shahreena Melati Binti Rhasbudin Shah

A technical talk on *Sustainable Transport* was conducted on 7 May 2024 for students enrolled in CEG552 – Highway and Traffic Engineering. The session was delivered by *Ir. Ong Sheng How*, Director of Perunding Trafik Progresif Sdn Bhd.

Have you ever been stuck in traffic and wondered if there's a better way to get around? That's exactly what the technical talk on sustainable transport explored. The speaker challenged a common assumption in city planning: that streets are meant to move cars. Instead, he argued that the real question should be, "How many people can we move down the street?" It turns out, cars, even electric ones, aren't very efficient when it comes to space. A single car takes up a lot of room but usually carries just one person. Multiply that across thousands of vehicles, and you get traffic jams, pollution, and wasted space. In contrast, buses, bikes, and walking paths can move far more people in the same amount of space. For example, a bus lane can carry up to 10,000 people per hour, while a regular traffic lane moves about 1,600 cars, or a maximum of 6,400 people.

In addition, sustainable transport isn't just about numbers. It's about fairness, health, and resilience. Not everyone can afford a car, so public transit and bike lanes make cities more inclusive. Walking and cycling also help reduce air pollution and keep people active. And when cities rely less on cars, they're better prepared for fuel shortages or climate-related disruptions.

So, what does this mean to us? It means we're part of the solution. Whether it's choosing to bike to class, supporting better public transit, or simply rethinking how we move through our cities, we can help shape a future that's smarter, healthier, and more sustainable. Next time you're walking down a busy street, ask yourself: not how many cars are here, but how many people could be.

There are cities that are already making this shift, such as Copenhagen's bike-friendly streets and New York's pedestrian zones, all show how prioritizing people over cars leads to cleaner, more vibrant urban spaces.

This shift in thinking is more than just a technical adjustment. It's a reimagining of what streets are for, who they serve, and how we build cities that are healthier, fairer, and more efficient. When we design streets for people, we create urban environments that are safer, more inclusive, and more adaptable to change. To truly embrace sustainable transport, we need to change how we measure success. Traditional metrics like "Level of Service" focus on how quickly cars move through intersections. But that doesn't tell us how accessible, safe, or sustainable a street is. Instead, we should measure:

i. Person-throughput: How many people can move through space.

ii. Level of Access: How easily people can reach jobs, schools, and services.

iii. Environmental impact: How transport choices affect air quality and emissions.

iv. Public health outcomes: How infrastructure supports active lifestyles and reduces stress.

This shift requires courage. It means reallocating road space, investing in transit, and sometimes slowing down cars to speed up cities. The future of transport isn't about faster cars; it's about smarter streets. Streets that prioritize people, connect communities, and support a healthier planet. By asking how we can move more people, not just more cars, we unlock the full potential of urban space and pave the way for cities that are vibrant, inclusive, and sustainable.

The above provides a brief overview of the technical talk. Further details and insights from the session will be shared in the upcoming edition of *Buletin FKA*.

A Visit To Centralized Sewage Treatment Plant In UiTM Penang

Chan Hun Beng, Raja Nor Husna Raja Mohd Noor, Adhilla Ainun Musir, Roziah Keria, Faizah Kamarudin, Zulfairul Zakariah

The course of Mechanical and Electrical Engineering is offered to Part 3 of Bachelor Degree in Civil Engineering (EC223) students. One of the topics in the course is Wastewater Treatment Process. A visit to the Centralized Sewage Treatment Plant (Loji Kumbahan Terpusat) in UiTM Cawangan Pulau Pinang was carried out with the consent from the Facility Unit to expose our students of the practices.

The capacity of the treatment is 10,000 PE. It is gated and locked to avoid trespassing by individual without the proper consent by Facility Unit. According to the facilitator, the first step of the process is Primary Mechanical Screen, which aims to remove physical objects such as papers and plastics to prevent damage and clogging of downstream equipment, piping, and appurtenances.

Gated Centralized Sewage Treatment Plant

Primary Clarifier

Briefing session

Secondary Clarifier

Sludge* Holding *Tanks

Aeration Tanks

The following process is named Clarifier to remove suspended solids through gravity settling, providing a clarified liquid effluent. In the primary clarifier, solids would settle and remove from the wastewater. The secondary clarifier uses biological processes to further purify wastewater.

Sludge after the primary clarifier and secondary clarifier (as case may be) is temporary stored in the holding tank before disposal or further processing. The sludge tank accumulates solid, semisolid, or slurry residual material as a by-product of wastewater treatment processes.

In between Primary and Secondary Clarifiers, a process happens in the Aeration Tank that tries to remove soluble contaminants, toxic chemicals and possible harmful pathogens from wastewater. Aeration as the name hints, provides oxygen to bacteria for treating and stabilizing the wastewater.

The last stage in the treatment is to release the treated water to drainage or river, after chlorine is added and the acceptable standard set by DOE and relevant authorities are verified.

An Overview of the Tanks

Semarak Keluarga, Harmoni Komuniti: Hari Keluarga Mengkuang Heights bersama FKA UiTM

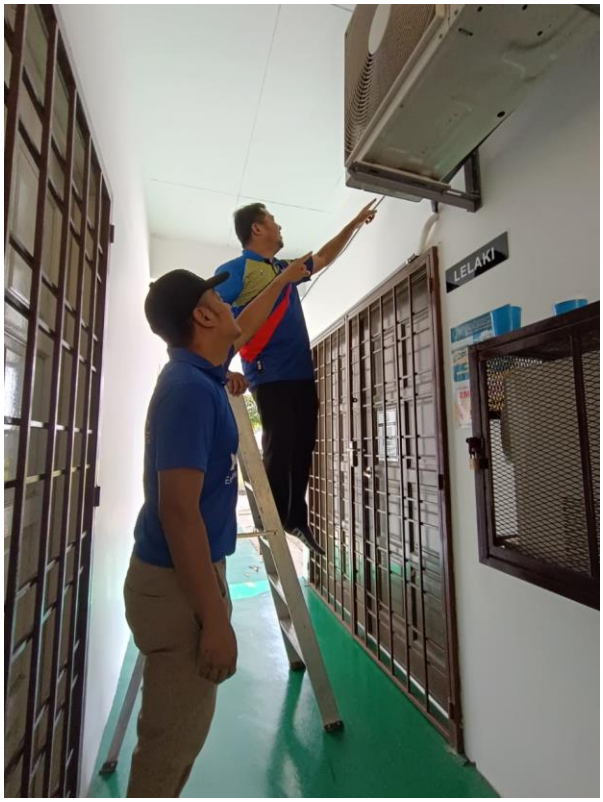
Nurulzatushima binti Abdul Karim, Adhilla bt Ainun Musir, Fairus Azwan bin Azizan, Afifudin Bin Habulat, Zanariah Abd Rahman, Syahirah Binti Mansor, Fuziatul Norsyiha Binti Ahmad Shukri, Nor Hafizah Hanis Abdullah

Pada 25 Februari 2024, satu Program Hari Keluarga yang ceria dan penuh kemeriahan telah dianjurkan di sekitar padang permainan dan dewan Taman Mengkuang Heights (TMH) dengan kerjasama Fakulti Kejuruteraan Awam (FKA), UiTM Pulau Pinang. Program ini berjaya melibatkan penyertaan dari kira-kira 40 buah rumah, dengan lebih kurang 80 orang penduduk yang terdiri daripada pelbagai lapisan umur, dari kanak-kanak seawal usia 4 tahun hingga dewasa berusia 50 tahun juga 8 orang pensyarah FKA.

Pelbagai aktiviti menarik telah dilaksanakan sepanjang program ini berlangsung. Antara aktiviti sukan yang menjadi tumpuan penduduk termasuklah acara Belon di Kaki, Selipar Muzik, Timbang Bola, Sepak Gol, Kotak Kaki Berjalan, Landing Plane, Belon Pecah di Kerusi, serta permainan menarik untuk pasangan seperti "Makin Jauh Makin Sayang", pertandingan berkumpulan menggunakan Kain Batik dan Kain Pelikat, dan acara khas untuk kanak-kanak di bawah umur 5 tahun seperti kutip gula-gula.

Selain aktiviti sukan dan permainan, pihak pensyarah FKA dari UiTM Pulau Pinang telah menjemput Klinik Kesihatan Berapit untuk turut serta dalam Program Hari Keluarga ini iaitu menawarkan aktiviti kesihatan yang telah mendapat kerjasama sepenuhnya dari penduduk TMH. Petugas kesihatan telah mengadakan sesi pemeriksaan kesihatan seperti pengukuran tahap gula dalam darah, pemeriksaan tekanan darah serta pengiraan Indeks Jisim Tubuh (BMI) bagi memastikan tahap kesihatan penduduk adalah memuaskan dan mencegah obesiti. Turut diadakan sesi kaunseling kesihatan yang memberi peluang kepada penduduk untuk mendapatkan nasihat serta panduan mengenai gaya hidup sihat.

Para pensyarah dari FKA juga terus menunjukkan komitmen kepada penduduk TMH dengan menjalankan pemeriksaan struktur bangunan surau di kawasan perumahan TMH. Inisiatif ini merangkumi proses mengenal pasti kecacatan (defect) struktur, menilai tahap keselamatan bangunan, dan memastikan keselesaan penduduk dalam menggunakan kemudahan surau tersebut. Berdasarkan pemeriksaan awal, beberapa isu struktur telah dikenal pasti dan para pensyarah telah memberikan cadangan teknikal untuk kerja-kerja pembaikan serta baik pulih bagi memastikan bangunan tersebut selamat dan selesa digunakan. Sumbangan kepakaran ini bukan sahaja memberi manfaat kepada komuniti, malah mencerminkan peranan aktif pensyarah dalam menyumbang kepada kesejahteraan dan keselamatan awam. Usaha seperti ini membuktikan bahawa kepakaran akademik yang dimiliki oleh pensyarah FKA, UiTM Pulau Pinang, dapat dimanfaatkan secara terus untuk kesejahteraan masyarakat, sekaligus memupuk budaya ilmu yang bersifat menyumbang dan bertanggungjawab



Turut menjadi tumpuan pada hari tersebut ialah pertandingan khas untuk kanak-kanak sekolah iaitu aktiviti membina jambatan menggunakan batang aiskrim. Aktiviti ini bertujuan untuk memberi peluang kepada para pelajar memahami asas kejuruteraan dalam pembinaan, selain memupuk semangat kerjasama di kalangan mereka dan melatih mereka berfikir secara kreatif dan kritis. Penilaian pertandingan dilakukan berdasarkan kekukuhan serta kreativiti reka bentuk jambatan yang dihasilkan oleh para peserta.

Secara keseluruhannya, program Hari Keluarga ini telah berjaya mengeratkan hubungan silaturahim sesama penduduk selain memupuk semangat kekeluargaan dan kerjasama komuniti bersama institusi pendidikan tinggi seperti UiTM. Program ini turut meningkatkan kesedaran kesihatan di kalangan penduduk serta memberi manfaat besar dalam aspek keselamatan dan keselesaan kemudahan awam taman.

Dari Kampus ke Pelabuhan : Lawatan Sambil Belajar ke Pelabuhan Pulau Pinang (*Penang Port*)

Ts. Zanariah binti Abd Rahman, Ir. Ts. Fairus Azwan bin Azizan, Mohd Khairul Azhar bin Ismail

Seramai 40 orang pelajar dari Program Ijazah Sarjana Muda Kejuruteraan Awam (Infrastruktur) dan Diploma Kejuruteraan Awam telah menyertai satu program lawatan sambil belajar ke Pelabuhan Pulau Pinang pada 14 November 2024 bermula seawal 9 pagi sehingga 12 tengahari. Lawatan ini dianjurkan oleh Kelab Penang Civil Engineering Student Society (P'CES) yang bernaung di bawah Fakulti Kejuruteraan Awam (FKA), UiTM Cawangan Pulau Pinang, dan disertai oleh tiga orang pensyarah pengiring iaitu En. Mohd Khairul Azhar Ismail, Ts. Zanariah binti Abd Rahman, dan Ir. Ts. Fairus Azwan Azizan.

Lawatan ini bertujuan memberi pendedahan praktikal kepada para pelajar yang sedang mengikuti kursus Highway and Traffic Engineering, khususnya berkaitan pengoperasian pelabuhan, sistem kawalan trafik perkapalan, serta struktur kejuruteraan dan penyelenggaraan bangunan pelabuhan.

Program ini bermula seawal jam 9 pagi dengan sesi ucapan pembukaan yang disampaikan oleh Encik Syarmizar bin Mhd Nasir selaku Pengurus Korporat Suruhanjaya Pelabuhan Pulau Pinang (SPPP) serta Ts. Zanariah binti Abd Rahman selaku pensyarah FKA UiTM Cawangan Pulau Pinang. Sesi taklimat ini kemudian diteruskan dengan penerangan berkenaan latar belakang pelabuhan pulau pinang, ruang lingkup kerja, ciri-ciri keselamatan yang diamalkan dan operasi yang dijalankan di pelabuhan pulau pinang oleh Puan Norwahida Azwani binti Mat Yusop selaku Jurutera SPPP dan Encik Hazwan bin Azhar selaku Ketua Seksyen Bahagian Operasi Penang Port Sdn Bhd (PPSB). Turut serta di dalam taklimat ini juga ialah para wakil dari SPPP dan para wakil dari PPSB. Selesai sesi taklimat, para pelajar kemudian dibawa masuk ke pelabuhan kontena iaitu di Pengkalan Kontena Butterworth Utara (PKBU) bagi melihat sendiri bagaimana skop kerja dan operasi yang dijalankan selain daripada melihat struktur dan infrastruktur yang ada di dalam kawasan PKBU.

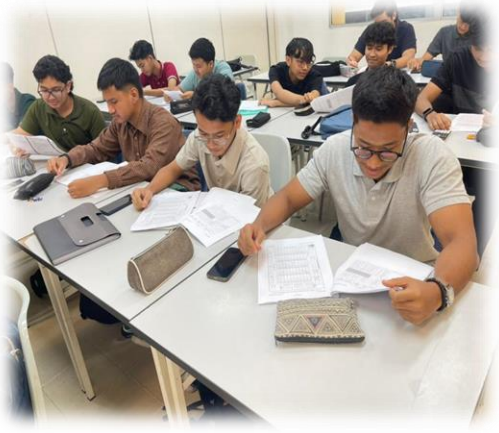
Lawatan ini berakhir sekitar jam 12 tengahari dan secara keseluruhannya, pendedahan ini telah memberi berpeluang kepada para pelajar untuk mengaplikasikan pengetahuan teori yang telah dipelajari di dalam kelas kepada situasi sebenar, terutamanya dalam aspek pengurusan logistik, kejuruteraan struktur dan sistem keselamatan. Lawatan ini juga telah membuka minda para pelajar tentang cabaran dan realiti yang wujud dalam bidang logistik dan pengangkutan maritim, sekali gus memberi mereka inspirasi dan pemahaman yang lebih mendalam mengenai kerjaya dalam industri ini.

Success of the *Cantas Gagal Program* for ECG243 Soil Mechanics in Advancing Academic Excellence

Roziah Keria, Azura Ahmad, Juliana Idrus, and Muhammad Sofian Abdullah

The "Cantas Gagal" program for the ECG243 Soil Mechanics subject was successfully organized to provide additional support to students, with the aim of improving their understanding of critical topics and ensuring their success in the course. A total of 84 students participated in this initiative, which consisted of two sessions held on 29 November 2024 and 24 January 2025. The primary objective of the program was to reduce the failure rate in the subject and provide an opportunity for students to gain deeper insights into challenging topics, thereby boosting their academic performance.

The first session, conducted on 29 November 2024, focused on Chapter 1: Physical Properties and Classification of Soil and Chapter 2: Flow of Water Through Soil. The second session, held on 24 January 2025, covered Chapter 3: Shear Strength of Soil and Chapter 4: Soil Compaction and Consolidation. These sessions were guided by a team of dedicated facilitators, including Puan Roziah Keria, Azura Ahmad, Cik Juliana Idrus, and Encik Muhammad Sofian Abdullah, who played a crucial role in delivering interactive and comprehensive sessions.



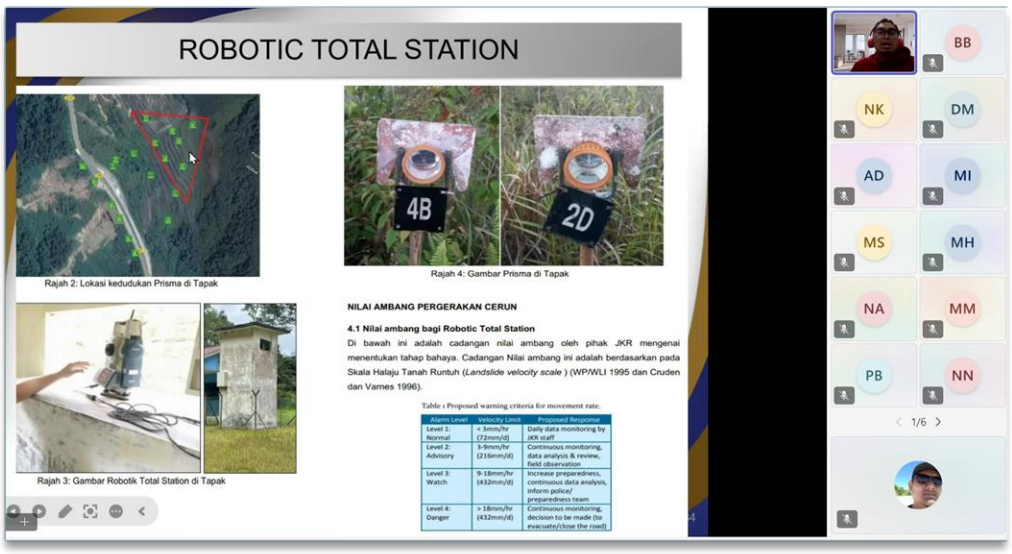
The objective of the program was clear: to provide a platform for students to enhance their understanding of key topics, address any doubts, and better prepare them for upcoming assessments. By focusing on specific chapters and fostering active engagement, the program aimed to reduce academic stress, improve exam performance, and equip students with the knowledge needed to excel in the subject.

The program received an excellent response, with over 90% attendance from the 84 students, indicating a strong desire among the students for extra support and guidance. The success of the program was reflected in the results following the test (covering Chapters 1 and 2) and the final exam (covering all the chapters). Notably, 48% of students achieved an A grade, and fewer than 4% failed—a remarkable improvement compared to the previous semester, when 36% of students failed and none received an A grade. One of the most remarkable outcomes of this program was the success of the repeat students. Five students, who had previously failed and were repeating the course (some for the second or third time) managed to pass with excellent results. This not only highlights the effectiveness of the "Cantas Gagal" program in providing support but also demonstrates the positive impact of focused intervention on student success.

In conclusion, the "Cantas Gagal" program for ECG243 Soil Mechanics has proven to be a highly effective initiative. It has significantly contributed to improving the academic performance of the students and helped reduce the failure rate in the course. The success of this program exemplifies how targeted academic support can play a pivotal role in helping students overcome challenges and achieve their full potential.

Technical Talk For Forensic Engineering (CEG562) Critical Slope Risk Engineering At Cameron Highland

Dr Juhaizad Ahmad, Ir Dr Ng Wen Kuan, Dr Anas Ibrahim, PM Dr Tey Li Sian & Ir Noraziyan Abd Aziz



4 December 2024 (Wednesday), 8.00-10.00 p.m. Via Microsoft Teams

A technical talk was held by Forensic Engineering (CEG562) lecturers on 4 December 2024. The invited speaker was Mr Ali Mutahir Ibrahim, Project Engineer for Pintas Utama Sdn. Bhd. The topic for the technical talk is Critical Slope Risk Engineering at Cameron Highland. This interesting topic was chosen because there have been a lot of slope failure events that have occurred, especially at this tourist attraction spot. Besides, this topic is a part of a sub-topic for this course. On top of that, it is the highest slope rehabilitation works conducted in Malaysia. The specific project shared by the speaker is “Projek Pembaikan Cerun Dan Membaik Pulih Jalan di Laluan FT185 Seksyen 44.1, Jalan Simpang Pulai – Blue Valley, Daerah Kinta, Perak”. The main client is Jabatan Kerja Raya (JKR). This slope rehabilitation work consists of horizontal drain & storm drainage works – chute, toe, roadside & cascade + sump, installation soil nailing – high tensile Terra Nail and local nail – 5900 nos & 3280 nos, construction of micropiles 300mm diameter, construction of hybrid reinforced earth structure -Terra Link Armastone System, rockfill & hydro vegetation works – downslope, temporary erosion protection– laying Fibromat, manual seeding, silt fence, slope re-profiling & construction of drainage system & horizontal drain at downslope, inspection and testing works – incoming material and ongoing work process, roadworks – milling and paving, binder and wearing course and EWS (Early Warning System). The slope height is more than 100m. This slope experienced many slope failures before, and the government has spent more than RM240 million to repair this slope since it is the main route to Cameron Highlands. The students were exposed to the challenges faced by this work, such as uncertain weather conditions at this site (high rainfall, dangerous for workers during heavy rainfall), heavy fog (stoppage of works due to poor visibility) and high gradient and loose soil slope with the presents of timbers within the excavation profile. The speaker shared his experience as a project engineer and as a UiTM alumni as well. He advised the students regarding their career path and what they need to furnish before entering the challenging life of an engineer.

Hybrid Integration of Computational Fluid Dynamics and Artificial Neural Networks for Enhanced Predictive Modelling in Hydraulic Engineering

Ir. Nur Azwa Binti Muhamad Bashar (UiTM & USM), Assoc. Prof. Dr. Mohd Remy Rozaini Bin Mohd Arif Zainol (USM), Dr. Intan Shafeenar Binti Ahmad Mohtar (UiTM) and Ir. Gs. Ts. Dr. Mohd Rashid Bin Mohd Radzi (TNB Power Generation Sdn. Bhd)

In recent years, the accurate prediction of fluid flow and the hydraulic properties of flow have become increasingly important for the management of underground and surface water systems and hydraulic structures. Computational Fluid Dynamics (CFD) has proven to be one of the most influential simulation techniques in the analysis of complex flow interactions in canals, spillways, reservoirs and other hydraulic systems. Despite its proven reliability and accuracy, CFD is still computationally intensive, particularly for real-time monitoring or large-scale water collection and storage systems. To overcome these limitations, researchers have explored the potential of Artificial Neural Networks (ANNs), which subdivide the ability of this method to approximate nonlinear functions based on input-output relationships. The integration of CFD with ANN represents a promising solution that combines the physical reliability of numerical models with the speed and adaptability of data-driven approaches.

The increasing number of complex flow solutions such as air-water interphase, air entrapment, bubble formation in a high-velocity flow, hydraulic jump, turbulent flow and cavitation problems, especially in flood events, require advanced simulation approaches such as CFD to solve the problem from the fundamental aspects to the application for engineering decision-making processes (Chanson, 2022; Chanson et al., 2021; Chanson & Shi, 2022). This selection was made due to the excellent simulation capabilities, reliability and realistic solutions of CFD for fluid dynamic problems (Mozaffari et al., 2022; Sharifi, 2025). However, its application is often limited by high computational costs and the requirement for expertise in setting up the system and validating the model (collected data from the physical inspection on site or the constructed, scaled-down physical model). This therefore represents a significant obstacle to the development of early warning systems, as this model offers a time-dependent approach. These limitations are particularly restricted to real-time predictions or decision support systems for managing hydraulic infrastructures. Conversely, ANN can provide fast approximations of system behaviour if the system is properly trained and sufficient data is available (Jabbari and Bae, 2018; Spiridonov et al. 2020). However, individual ANN models often have problems with reliability and accuracy when exposed to complex flow scenarios without physical laws embedded in the numerical models (Frnda et al., 2022). An urgent challenge is therefore to develop hybrid methods that integrate CFD with ANNs to capitalise on the strengths of both data-driven and physics-based approaches.

Despite the growing interest in the integration of CFD and ANN, some limitations have been emphasised. These include that most hybrid models are domain-specific and have limited ability to adapt to different hydraulic conditions or geometries, such as spillway capacity during flooding, unsymmetrical structure and capacity of the incoming stilling basin with baffle structure to control hydraulic jump, and erosion and sedimentation issues. Secondly, the quantification of uncertainties in ANN predictions remains underexplored, which is particularly important for high-risk applications such as dam failure analysis or modelling extreme weather conditions under the influence of climate change. Third, the training of ANN models often requires extensive and high-quality CFD data sets, which are costly and time-consuming to generate. Finally, the unstable nature of ANN models poses a challenge in terms of data interpretation and reliability, especially for engineers who need clear and accurate results to support the engineering decision-making process.

To address these gaps, future research should prioritise the development of general hybrid modelling frameworks which capable of learning from multiple hydraulic scenarios and geometries. The use of transfer learning could reduce data requirements and enable faster distribution across related domains. Research should also explore inexplicable artificial intelligence techniques to enhance the transparency of ANN outputs, allowing users to understand and validate model behaviour. Finally, collaborative efforts to create open-source benchmark datasets and modelling platforms would support reproducibility and encourage broader adoption of hybrid approaches.

In conclusion, the integration of CFD and ANN is a forward-looking strategy in fluid and hydraulic engineering that has the potential to deliver faster, effective and reliable predictions. By addressing current methodological challenges and advancing interdisciplinary research, this hybrid approach can contribute to resilient, intelligent and sustainable water infrastructure systems. Therefore, the positive integration of CFD and ANN today offers a trade-off effect, especially in the face of increasing environmental uncertainties and infrastructure requirements.

References:

Chanson, H. (2022). On air entrapment onset and surface velocity in high-speed turbulent prototype flows. *Flow Measurement and Instrumentation*, *83*, 102122. https://doi.org/https://doi.org/10.1016/j.flowmeasinst.2022.102122

Chanson, H., Leng, X., & Wang, H. (2021). Challenging hydraulic structures of the twenty-first century – from bubbles, transient turbulence to fish passage. *Journal of Hydraulic Research*, *59*(1), 21-35. https://doi.org/10.1080/00221686.2020.1871429

Chanson, H., & Shi, R. (2022). Optical measurements in dam spillways during major flood events: a down-to-earth review of pros and cons. Hydrology & Water Resources Symposium 2022 (HWRS 2022): The Past, the Present, the Future: The Past, the Present, the Future,

Frnda, J., Durica, M., Rozhon, J., Vojtekova, M., Nedoma, J., & Martinek, R. (2022). ECMWF short-term prediction accuracy improvement by deep learning. Scientific Reports, 12(1), 1-11.

Jabbari, A., & Bae, D. H. (2018). Application of Artificial Neural Networks for accuracy enhancements of real-time flood forecasting in the Imjin basin. Water, 10(11), 1626.

Mozaffari, S., Amini, E., Mehdipour, H., & Neshat, M. (2022). Flow Discharge Prediction Study Using a CFD-Based Numerical Model and Gene Expression Programming. *Water*, *14*(4), 650. https://doi.org/10.3390/w14040650

Sharifi, S. N. (2025). Enhancing performance of stepped spillways: CFD analysis of shaped step surfaces for improved flow dynamic. *Results in Engineering*, *25*, 103704. https://doi.org/https://doi.org/10.1016/j.rineng.2024.103704

Spiridonov, V., Baez, J., Telenta, B., & Jakimovski, B. (2020). Prediction of extreme convective rainfall intensities using a free-running 3-D sub-km-scale cloud model initialized from WRF km-scale NWP forecasts. Journal of Atmospheric and Solar-Terrestrial Physics, 209, 105401.

BENGKEL INTENSIF FLUID MECHANICS

Satira Hambali & Amalina Amirah Abu Bakar

Pada semester Oktober'24-Februari'25 yang lalu, tiada lagi Bengkel Cantas Gagal dijalankan seperti semester-semester sebelumnya. Bengkel Cantas Gagal ini digantikan dengan Bengkel Intensif Fluid Mechanics, di mana ia agak berbeza sedikit kerana tidak melibatkan keseluruhan pelajar. Bengkel ini diwajibkan ke atas pelajar yang mengulang dan beberapa pelajar terpilih yang dianggap lemah dalam fizik/matematik berdasarkan keputusan semester sebelumnya. Sebelum membuat pilihan ke atas pelajar, pensyarah terlebih dahulu membuat semakan keputusan peperiksaan ke atas setiap pelajar bagi mengenalpasti pelajar-pelajar yang benar-benar memerlukan bimbingan. Sepanjang semester, jika pensyarah mendapati ada pelajar lain yang lemah dan memerlukan perhatian tambahan, pensyarah boleh menambah pelajar tersebut ke dalam Bengkel Intensif yang sedia ada.

Bengkel Intensif Fluid Mechanics ini telah dijalankan dalam 3 siri. Siri pertama diadakan pada minggu ke-6 sebagai kelas ulangkaji. Semasa bengkel, pensyarah membincangkan topik-topik yang telah diajar dari minggu pertama hingga minggu ke-5 bagi meningkatkan pemahaman pelajar terhadap topik-topik tersebut. Siri kedua diadakan pada penghujung minggu ke-8 sebagai persediaan untuk Ujian pada minggu ke-9. Satu set soalan yang merangkumi topik dari minggu pertama hingga minggu ke-8 diberikan kepada pelajar sebelum bengkel untuk mereka cuba. Semasa bengkel, pelajar diajar strategi yang berkesan untuk menjawab soalan ujian/peperiksaan. Siri ketiga diadakan pada penghujung minggu ke-14. Sama seperti siri kedua, satu set soalan diberikan kepada pelajar sebelum bengkel untuk mereka cuba, tetapi untuk bengkel kali ini, soalan tersebut merangkumi semua topik.

Bengkel ini memainkan peranan yang penting dalam membantu pelajar untuk lulus subjek ini, dengan syarat pelajar menghadiri ketiga-tiga bengkel, mencuba terlebih dahulu soalan yang diberikan serta mengambil bahagian dengan mengajukan soalan semasa bengkel. Secara keseluruhannya, bengkel ini berjaya mencapai objektifnya, iaitu untuk mengurangkan peratusan kegagalan. Hasil daripada bengkel ini, hanya 11 daripada 84 orang pelajar yg gagal (13%), manakala yang mendapat A/A+ adalah seramai 20 daripada 84 orang pelajar (24%).

SIRI 1

SIRI 2

SIRI 3

Sustainable Water Filtration System - Hybrid SRWaFilS: A Low-Cost and Highly Efficient System (Rainwater-Greywater Collection and Filtration Unit) for Non-potable Use.

Ir. Nur Azwa Binti Muhamad Bashar (UiTM & USM), Pn. Ruziah Binti Ahmed (SKBP), Pn. Zuraini Binti Abdul Kadir (SKBP), Nur Alani Fatini Binti Husnul Amir (SKBP), Nur Nisrina Nabihah Binti Husnul Amir (SKBP), Muhamad Izz Rayyan Bin Mohd Hafiz (SKBP) and Zara Khayr Binti Mohd Khairani (SKBP)

For decades, global warming due to climate change has had an impact on society, the economy and the sustainability of the planet. Large areas of natural forests and land have been replaced with concrete and paved surfaces. These changes affect hydrometeorological conditions, leading to more extreme rainfall patterns, higher rainfall intensity, and flash floods caused by excessive surface runoff. This surface runoff is not absorbed by the soil system or intercepted by the drainage system due to certain factors such as the full capacity of the soil system (wet and saturated conditions), inadequate drainage capacity, and the absence of gutter systems in some residential areas (particularly older residential areas lacking sustainable rainwater harvesting systems). A clean and continuous water supply is compulsory for our daily life and activities. Conventionally, water stored in underground sources and reservoirs is treated before being supplied to consumers. Furthermore, the consumption of clean water before the above parameters listed by the World Health Organisation (WHO) and the specific water quality standards for each country is essential. In Malaysia, the water quality parameters must meet the National Water Quality Standard (NWQS) before the water can be used for both potable and non-potable use.

The accumulation of rainwater has increased, especially during episodes of heavy rainfall caused by climate change, yet it is often neglected and left unused or untreated. This abundant rainwater can be collected, treated, and used for non-potable purposes such as cleaning pavements and watering gardens. Collecting rainwater from rooftops offers an effective solution to water scarcity, particularly in drought-prone and seasonally dry regions, as well as areas with high irrigation demands. In addition, the increasing volume of greywater from kitchen sinks and external drainage systems (canalised domestic water systems) can also be reused as service water. Even when the collected water is intended for non-potable purposes, it should still be treated to reduce chemical properties to levels deemed safe by the relevant authorities. If the collected rainwater is contaminated, physical contact with the water may cause adverse effects, such as skin redness or irritation. To address this, a portable and sustainable water filtration system is recommended for domestic use (both households and institutions). Such systems should be cost-effective, provide basic treatment of service water, and require minimal maintenance.

In response to the growing need for an alternative water source, this project focuses on producing clean water suitable for non-potable use through an economical, portable, and customised water filtration system. The proposed hybrid filter media serves as an alternative to conventional filtration media, combining adsorption and filtration mechanisms to enhance treatment efficiency while prioritising cost-effectiveness, minimising environmental impact, and supporting sustainable water treatment infrastructure. This project was initiated, proposed, and developed by an outstanding group of junior scientists from the STEM programme at Sekolah Kebangsaan Bertam Perdana (SKBP), in collaboration with the Faculty of Civil Engineering (FCE), Universiti Teknologi MARA (UiTM), Penang Branch. The team comprised two teachers (Pn. Ruziah and Pn. Zuraini) and four students (Alani Fatini, Nisrina Nabihah, Izz Rayyan, and Zara), working alongside FCE UiTM representative Ir. Nur Azwa, as shown in Figure 1. In this project, a low-cost and portable water filtration system named SRWaFils was developed, tested, and analysed to evaluate its operating system and overall effectiveness. This initiative aligns with the United Nations Sustainable Development Goals (SDGs) #6 (Clean Water and Sanitation), #11 (Sustainable Cities and Communities), and #13 (Climate Action).

Figure 1: The engagement (knowledge transfer session: discussion and testing) session between SKBP and FCE, UiTM at Science Lab, Sekolah Kebangsaan Bertam Perdana

The SRWaFilS system offers several innovative and unique features, including a sustainable hybrid filtration design that integrates natural resources with layers of recycled materials as filter media. It is economical, low-maintenance, and cost-effective, featuring a robust two-stage filtration process: pre-filtration and a primary filtration unit (optional, depending on the type of water collected).In addition, SRWaFilS contributes to improved quality of life by minimising social, economic, and environmental impacts. It supports the earth's natural self-cleaning mechanisms, provides clean and safe water for general purposes (such as plant irrigation and pavement cleaning), addresses issues related to non-biodegradable solid waste, and helps reduce landfill pollution. Furthermore, it mitigates problems of surface runoff and flooding, alleviates water scarcity and drought conditions, and reduces dependence on raw natural materials (e.g., sand and gravel). Sustainable and recycled materials were utilised in the development of this water filtration system, as illustrated in Figure 2.

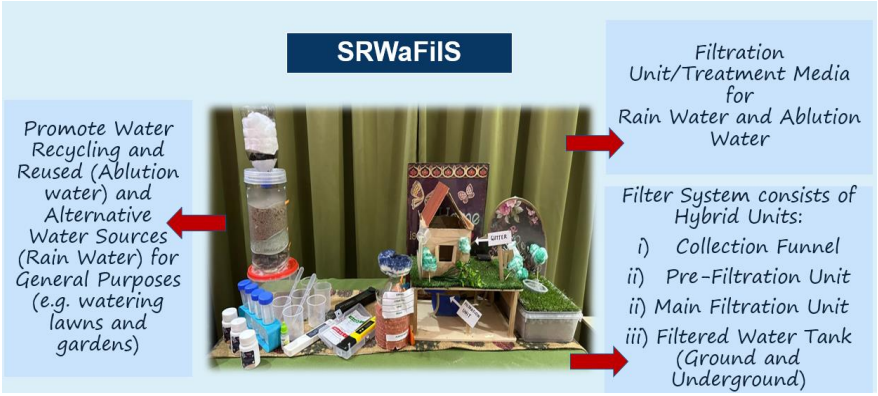


Figure 2: SRWaFiLS real-time hybrid filtration system

The proposed SRWaFilS system has been registered with MyIPO Malaysia under copyright number LY2023W02670. In addition, SRWaFilS has attracted significant attention from innovation judges, winning multiple gold and silver medals at various international and national innovation competitions organised by Universiti Teknologi MARA (UiTM), Universiti Malaysia Perlis (UniMAP), Kolej Vokasional Tanah Merah, and Jabatan Pendidikan Negeri Pulau Pinang. In conclusion, the SRWaFilS hybrid filtration system has proven effective in treating rainwater and greywater, achieving reductions in COD and turbidity levels ranging between 43% and 54%. The fabricated filter media unit is a practical and essential tool that supports the United Nations 2030 Agenda, particularly SDG #13: Climate Action. It addresses environmental issues at their source and minimises their potential impact on society and economic activity. Rainwater harvesting should be encouraged for all stakeholders, including private households and institutions, to promote sustainable development. The filtered water can be safely reused for plant irrigation and general cleaning purposes. The proposed filtration system is both sustainable and cost-effective, featuring a simple setup suitable for private and public use.

SLOT: ROKET JIWA

Oleh Skuad Motivasi dan Pembangunan Pelajar

Roziah Keria

Langkah Pertama, Langkah Paling PENTING!

"Tak perlu jadi hebat untuk mula. Tapi kita perlu mula untuk jadi hebat!"

Ramai pelajar beranggapan mereka perlu tunggu 'mood' atau semangat datang terlebih dahulu sebelum boleh berubah atau mencapai kejayaan. Hakikatnya, kejayaan tidak datang dengan menunggu ilham, tetapi bermula dengan satu **langkah kecil** yang konsisten.

Cubalah kita bayangkan:

Kalau hari ini kita mula ulang kaji 10 minit, esok tambah jadi 15 minit, dan seterusnya kekalkan konsistensi itu, lama-kelamaan ia akan jadi rutin tanpa rasa terbeban. Tetapi… **kalau kita tidak mula langsung? Tiada apa pun yang akan berubah**, betul kan?

Lihatlah pelajar cemerlang:

Bukan semuanya lahir genius. Ramai bermula dengan kelemahan juga. Bezanya, mereka ambil **langkah kecil** dan ulang setiap hari. Sama seperti membina otot: semakin dilatih, semakin kuat. Setuju?

🛠 Tips Memulakan Langkah Pertama:

1. **Tulis Matlamat Ringkas:** Contohnya, "Saya nak capai 3.5 GPA semester ini."
2. **Buat Jadual Mini:** Tak perlu sempurna; 10 minit fokus ulang kaji pun sudah cukup untuk mula.
3. **Elak Tunggu "Rasa Rajin":** Buat dulu, semangat akan datang kemudian. Lama-lama akan jadi kebiasaan yang menyeronokkan.
4. **Beri Ganjaran kepada Diri Sendiri:** Selepas siap ulang kaji, beri ganjaran kecil – tengok YouTube atau TikTok, main game 10 minit, dan sebagainya. Tapi jangan sampai tak boleh henti pula!

Ingat tak kira siapa kamu sekarang sama ada pelajar biasa, pemalu, lemah dalam subjek tertentu. **Yang pastinya semua boleh jadi luar biasa kalau berani ambil langkah pertama.** Semester ni, ambil satu langkah. Semester depan, kamu akan terkejut sejauh mana kamu dah pergi.

"*Mini Sambutan Kayuhan 25 Tahun UiTM Cawangan Pulau Pinang*" Program in Conjunction with the 25th Anniversary Celebration of UiTM

Norlizan Binti Wahid, Khairil Anuar Bin Bahari,
Prof Madya Dr Johanudin Bin L. Wahab and Ts. Dr. Adi Izhar Che Ani

The "Mini Sambutan Kayuhan 25 Tahun UiTM Cawangan Pulau Pinang" program was held on 29 June 2024. The UiTM Penang cycling team, together with support crews led by Ts. Dr. Adi Izhar Che Ani, joined the main team of the "Kayuhan Kapsul Rentas Cawangan Sempena 25 Tahun UiTM" program on a 169.05 km journey from UiTM Pulau Pinang, Permatang Pauh Campus, to UiTM Perak, Seri Iskandar Campus.

Figure 1: UITM Penang cycling team.

The program was organized to demonstrate support for the main team of the "Kayuhan Kapsul Rentas Cawangan Sempena 25 Tahun UiTM," which commenced its cross-campus journey across Peninsular Malaysia on 20 June 2024. This commemorative ride celebrates the 25th anniversary of UiTM's establishment as a public institution of higher learning, officially founded on 26 August 1999.

Figure 2: "Kayuhan Kapsul Rentas Cawangan Sempena 25 Tahun UiTM" team.

The cycling program involved a total of 30 participants, including cyclists and support staff. Among them were 12 staff cyclists, including the sole female rider, Norlizan Wahid, a lecturer from Pengajian Kejuruteraan Awam, UiTM Pulau Pinang, and 4 student cyclists. They have cycled nearly 2,000 km across Peninsular Malaysia in a two-week period starting from 20 June to 2 July 2024.

Symbolically, the team carried a capsule containing the hopes and aspirations of each UiTM campus, envisioning a brighter and more successful future for the university over the next 25 years.

Program CANTAS GAGAL for CEW541 & CEW547: Engineering Hydrology Workshop

Dr. Intan Shafeenar Ahmad Mohtar, Ir. Nur Azwa Binti Muhamad Bashar &
Dr. Kuan Woei Keong

Approximately 100 students from the CEW541 and CEW547 Engineering Hydrology courses participated in a focused and impactful learning session under the Program CANTAS GAGAL — a special hands-on workshop designed to strengthen students' understanding and performance in Engineering Hydrology.

This initiative was guided by three passionate facilitators-Dr. Intan Shafeenar Ahmad Mohtar, Ir. Nur Azwa Binti Muhamad Bashar and Dr. Kuan Woei Keong. The main aim of this workshop was to ensure that all students can pass the course by providing additional support, clarification, and practical exposure to the subject matter. The program was carefully structured to help students overcome common misconceptions, build confidence, and master key topics in Engineering Hydrology through a combination of thorough discussions and interactive hands-on sessions.

Each topic was covered in detail by the facilitators, with clear explanations and real-life examples. The workshop's title, "CANTAS GAGAL", captured its mission — to eliminate failure by addressing learning gaps and reinforcing core concepts. The facilitators also highlighted important professional values such as teamwork, data accuracy, and responsibility in engineering work.

Feedback from students was overwhelmingly positive. Many appreciated the chance to engage in discussions, ask questions freely, and work through challenging topics in a more relaxed, supportive environment. The practical exercises helped link theory to application, making the subject more relatable and easier to grasp.

The CANTAS GAGAL program was a meaningful and empowering experience for the students of CEW541/CEW547, playing a vital role in helping them succeed academically and preparing them for future challenges in civil engineering.

Mesyuarat Jawatankuasa Teknikal PPKA Pulau Pinang: Penilaian Peralatan Universal Testing Machine (UTM) 1000KN

Azura Ahmad, Dr Juhaizad Ahmad, Siti Fatimah Sadikon

Pada 25 Oktober 2024, satu mesyuarat Jawatankuasa Teknikal Peralatan Makmal Pusat Pengajian Kejuruteraan Awam (PPKA) telah diadakan di Makmal ICT 1.4, Tingkat 1, Laman Perdana, Kompleks Perdana. Mesyuarat ini berlangsung dari pukul 9.00 pagi sehingga 1.00 tengah hari dengan tujuan utama mendapatkan kelulusan Jawatankuasa Teknikal Peralatan Makmal PPKA bagi sebut harga rasmi peralatan Universal Testing Machine (UTM) 1000KN.

Mesyuarat ini diadakan dengan beberapa objektif utama. Pertama, jawatankuasa bertanggungjawab untuk menilai sebut harga rasmi bagi perolehan Universal Testing Machine (UTM) 1000KN yang akan digunakan di makmal PPKA. Proses ini melibatkan penelitian mendalam terhadap pelbagai tawaran yang diterima bagi memastikan pemilihan yang terbaik.

Selain itu, mesyuarat ini juga bertujuan untuk meneliti pematuhan syarikat yang mengambil bahagian terhadap syarat-syarat dan spesifikasi mandatori yang telah ditetapkan dalam sebut harga rasmi. Keupayaan syarikat untuk memenuhi keperluan teknikal ini amat penting dalam memastikan peralatan yang diperoleh mampu memberikan prestasi yang optimum serta memenuhi piawaian yang ditetapkan.

Foto-foto sesi mesyuarat jawatankuasa teknikal sedang berlangsung.

Dalam mesyuarat ini, setiap ahli jawatankuasa teknikal turut membentangkan dan menjelaskan maklumat berkaitan. Pembentangan ini memberi peluang kepada jawatankuasa untuk mendapatkan pemahaman yang lebih mendalam mengenai ciri teknikal, operasi, dan kecekapan peralatan yang ditawarkan oleh syarikat. Melalui sesi ini, jawatankuasa dapat menilai keberkesanan serta keupayaan peralatan secara lebih terperinci dalam menyokong aktiviti penyelidikan dan pembelajaran di PPKA.

Akhir sekali, mesyuarat ini bertujuan untuk membuat keputusan berdasarkan penilaian teknikal yang telah dijalankan. Jawatankuasa memastikan bahawa peralatan yang dipilih adalah yang paling sesuai untuk keperluan makmal dari segi ketepatan teknikal, kecekapan operasi, dan kebolehpercayaan jangka panjang. Keputusan yang diambil bukan sahaja akan memberikan manfaat kepada institusi tetapi juga kepada para penyelidik dan pelajar yang bergantung kepada peralatan ini untuk menjalankan kajian mereka.

Kesimpulannya, mesyuarat Jawatankuasa Teknikal Peralatan Makmal PPKA telah berjalan dengan lancar, membolehkan penilaian yang menyeluruh terhadap sebut harga rasmi bagi Universal Testing Machine (UTM) 1000KN. Keputusan yang dibuat oleh jawatankuasa ini akan menjadi panduan utama dalam pemilihan peralatan yang terbaik, sekaligus menyumbang kepada peningkatan kualiti penyelidikan dan pembelajaran dalam bidang kejuruteraan awam.

PKA'S TEAM BUILDING STRONGER TOGETHER: BUILDING BONDS, BOOSTING SUCCESS

Satira Hambali, Raja Nor Husna Raja Mohd Noor, Juzailah Nur Yunus, Mohd Samsudin Abdul Hamid, Adhilla Ainun Musir, Nurulzatushima Abdul Karim, Kamsiah Abdul Wahab, Zul Azmi Mohtar, Zaini Endut, Siti Hafizan Hassan, Ng Kok Shien, Suzana Ahmad, Nurul Nor Fazlina Fazil, Mohamad Azrul Aswad Mohamad Nor, Md Faizal Zakaria

PKA's Team Building 2024 was successfully held at Sedim Riverside Resort, Karangan, Kedah on July 10 - 11, 2024. This Team Building program involved 85 staff members from the Civil Engineering Faculty, UiTM Permatang Pauh, consisting of lecturers, assistant engineers, and laboratory assistants.

The two-day program was conducted with these objectives in mind:

i. To increase awareness of the importance of each individual's role in the faculty.
ii. To foster a sense of responsibility among members for both their individual and group tasks.
iii. To instill a sense of mutual respect among members when carrying out tasks and responsibilities.
iv. To create a cheerful and productive working environment to achieve the organization's goals.

Prior to the program, all staff members were divided into four teams (red, blue, green, and yellow). The team building activities on the first day began as early as 9:00 a.m. with a briefing session by Dr. Mohd Samsudin Abdul Hamid, who explained the objectives and rules for each game, followed by an aerobics session conducted by Cik Nurul Shahila Shahri Azhar from Sedim Riverside Resort. The games that were held during the morning session included Tarantula, Tuju Tin, and Ceboq Ayaq Sungai, while the Football Dart was held in the afternoon session.

Briefing on the rules of each game by Dr. Sam

Football Dart

In the evening, after maghrib prayers, there was recitation of Yasin led by Dr. Anas Ibrahim, followed by a 'tazkirah', also by Dr Anas. After that, traditional games such as Batu Seremban, Tutup Botol, and Dam Aji were held. On the second day, the activities began with a Treasure Hunt and concluded with the prize-giving session. The Blue Team, led by Ir. Dr. Mohd Ashaari Masrom, emerged as the overall champion of the Team Building event.

Performing prayers at Musolla

Briefing on Traditional Games by Dr Sam

Durian Time

Through this Team Building program, majority of the staff expressed their happiness and satisfaction with the activities carried out over the two days. It's been a while since PKA had the last team-building program. It is hoped that this program achieved its objectives of creating mutual respect among members, strengthening bonds, and ultimately improving the appreciation and understanding of the concept and importance of a culture of excellence in the workplace which will contribute to the formation of a strong organization in the future.

Overall Champion : Blue Team

"Biru Biru…ke Langit Biru"

Red Team

Blue Team

Green Team

Yellow Team

Pengurusan Infrastruktur dan Komuniti Berdaya Tahan (RICoM) – Kumpulan Inisiatif Penyelidikan

Masyitah Md Nujid, Nor Azliza Akbar, Mohd Samsudin Abdul Hamid, Siti Hafizan Hassan, Kuan Woei Keong dan Siti Rahimah Rosseli

Pengurusan Infrastruktur dan Komuniti Berdaya Tahan (RICoM) merupakan entiti kumpulan inisiatif penyelidikan yang berpusat di Pengajian Kejuruteraan Awam, Kolej Kejuruteraan, UiTM Cawangan Pulau Pinang, Kampus Permatang Pauh ditubuhkan secara rasmi pada 1 November 2024 di bawah Neksus Penyelidikan UiTM (ReNeU), Kluster Tenaga & Alam Sekitar (EE) di bawah urus tadbir Pejabat Timbalan Naib Canselor (Penyelidikan dan Inovasi) Universiti Teknologi MARA, Shah Alam. RICoM terdiri daripada enam orang ahli tetap termasuk ketua iaitu Dr Masyitah Md Nujid, dan ahli-ahli tetap iaitu Dr Nor Azliza Akbar, Dr Mohd Samsudin Abdul Hamid, Dr Siti Hafizan Hassan, Dr Kuan Woei Keong dan Siti Rahimah Rosseli. Kumpulan ini turut juga disokong oleh beberapa ahli bersekutu iaitu Dr. Hazrina Ahmad, Dr. Juhaizad Ahmad, Dr. Anas Ibrahim, Ir. Dr. Goh Lyn Dee dan Dr. Salina Alias.

RICoM mempunyai kepelbagaian kepakaran kejuruteraan terdiri daripada bidang geoteknik, struktur, sumber air dan pengurusan projek dibawah penasihat penyelidikan luar dilantik iaitu Prof. Dr. Roslan Zainal Abidin. Penubuhan RiCOM adalah; i) Meningkatkan daya tahan infrastruktur dan komuniti melalui penyelesaian kejuruteraan yang inovatif, amalan pengurusan bencana yang berkesan, dan strategi pembangunan mampan; ii) Menawarkan kepakaran teknikal dalam pencegahan dan mitigasi bencana kejuruteraan untuk pihak berkuasa dan industri tempatan; iii) Membangunkan dan melaksanakan penyelesaian infrastruktur yang mampan untuk bertahan dan pulih daripada bencana; iv) Menyediakan perkhidmatan perancangan, reka bentuk dan pemantauan yang komprehensif sebelum, semasa, dan selepas kejadian bencana dan v) Mengintegrasikan strategi penyesuaian perubahan iklim ke dalam pelan pengurusan bencana dalam pendekatan pelbagai disiplin yang merangkumi pelbagai disiplin kejuruteraan yang berkaitan dengan pengurusan bencana, termasuk pengurusan sungai, pantai, rupa bumi, jalan raya, bangunan, jambatan dan empangan. RICoM turut menyokong agenda matlamat pembangunan mampan (*sustainable development goals, SDG*) iaitu SDG 9 (*Industry Innovation Infrastructure*), *Sustainable Cities and Communities* (SDG 11) dan *Climate Action* (SDG 13). RICoM meletakkan sasaran jangka pendek dan panjang dalam melestarikan penyelidikan melalui pengurusan infrastruktur dan komuniti berdaya tahan.

PROGRAM STEM SMITI-UiTM 2024

Daliah binti Hasan, Khairul Ammar bin Muhammad Ali, Amalina Amirah binti Abu Bakar, Nik Farhanim binti Imran, Adhilla Ainun Musir, Zuraisah binti Dollah, Nurulzatushima binti Abdul Karim, dan Nor Hafizah Hanis binti Abdullah

Pada 25 OKTOBER 2024, seramai lapan (8) orang pensyarah Pengajian Kejuruteraan Awam UiTM Cawangan Pulau Pinang telah dijemput untuk menjayakan Minggu Sains, Teknologi, Kejuruteraan dan Matematik (STEM) yang diadakan di Sekolah Menengah Integrasi Teras Islam Sains Bahrul Ulum (SMITI). Program ini bertujuan untuk memupuk minat pelajar dalam bidang STEM melalui pelbagai aktiviti interaktif dan pertandingan yang dirancang.

Salah satu acara utama dalam program ini adalah pertandingan "Bridge Challenge" yang melibatkan penyertaan pelajar dari Tingkatan 1, 2, dan 3. Pertandingan Bridge Challenge yang diadakan ini bertujuan mengasah kemahiran pelajar dalam reka bentuk dan pembinaan jambatan, di samping meningkatkan daya kreativiti, pemikiran kritis, serta kerja berpasukan. Selain itu, program ini juga memberi peluang kepada para pelajar untuk berinteraksi dengan pensyarah selaku fasilitator dan mendapatkan bimbingan secara langsung, sekaligus menginspirasi mereka untuk meneroka lebih lanjut bidang kejuruteraan dan teknologi pada masa hadapan.

Para pelajar sedang menyiapkan model jambatan sambil dibantu oleh fasilitator

Pensyarah juga memainkan peranan penting sebagai juri bagi pertandingan Bridge Competition, menilai reka bentuk, ketahanan, dan inovasi jambatan yang dibina oleh pelajar Tingkatan 1, 2, dan 3. Selain bertindak sebagai penilai, pensyarah juga membimbing pelajar semasa mereka membina model jambatan mengikut kumpulan yang telah ditetapkan. Mereka memberikan tunjuk ajar mengenai prinsip asas struktur, pemilihan bahan yang sesuai, serta teknik pembinaan yang betul bagi memastikan model yang dihasilkan kukuh dan berfungsi dengan baik.

Bimbingan ini bukan sahaja membantu para pelajar memahami aplikasi teori dalam dunia sebenar, tetapi juga menggalakkan pemikiran kritis, penyelesaian masalah, dan kerja berpasukan. Kehadiran para pensyarah dalam program ini bukan sahaja memastikan pertandingan berlangsung secara adil dan profesional, tetapi juga berfungsi sebagai sumber inspirasi kepada para pelajar untuk mendalami bidang STEM pada masa hadapan.

Model-model yang telah siap, diuji menggunakan beban. Pemenang bagi pertandingan ini adalah berdasarkan model yang mampu menampung beban paling banyak

Secara keseluruhannya, pertandingan “Bridge Challenge” di SMITI telah berjaya mencapai objektifnya dalam memupuk minat pelajar terhadap Sains, Teknologi, Kejuruteraan, dan Matematik melalui aktiviti yang interaktif dan mencabar. Dengan bimbingan daripada pensyarah, para pelajar bukan sahaja dapat meningkatkan pemahaman mereka mengenai konsep kejuruteraan tetapi juga mengasah kemahiran berfikir secara kritis, menyelesaikan masalah, dan bekerjasama dalam kumpulan. Selain itu, program ini turut memberi peluang kepada para pensyarah untuk berkongsi pengalaman serta bertukar fikiran, sekali gus mewujudkan persekitaran pembelajaran yang lebih dinamik dan menarik. Diharapkan program seperti ini dapat diteruskan pada masa hadapan bagi melahirkan generasi yang lebih celik teknologi serta berdaya saing dalam bidang STEM.

Barisan pensyarah dan guru yang terlibat sepanjang program dijalankan

CDL-CQI DAY 2.0 FOR PKA UiTMCPP

Khairul Afinawati Hashim, Ir Khairul Ammar Muhammad Ali, Dr Hazrina Ahmad,
Norlizan Wahid, Amir Khomeiny Ruslan, Nurulzatushima Abdul Karim, Md Rasul Mohamad Nor

Date: 7th October 2024
Time: 9:00 AM
Venue: Seminar Hall, UiTMCPP

On 7th October 2024, CDL-CQI Day 2.0 was successfully organized by the Civil Engineering Centre (PKA) of UiTM Cawangan Pulau Pinang (UiTMCPP). The event saw the active participation of all lecturers from the Master's program (CEEC707/708), Bachelor's Degree program (CEEC221/223), and Diploma program (CEEC110). The primary objective was to enhance curriculum quality and to review the achievement of Program Outcomes (PO) for each course offered during the March 2024 – August 2024 semester (20242).

Event Agenda:

Opening and Outcome Presentation:

The event commenced at 9:00 AM with a detailed presentation by the OBE Unit of PKA UiTMCPP on the analysis of PO achievements for the Mac 2024 - August 2024 Semester (20242). The presentation focused on the analysis results highlighted the performance and achievement of various program outcomes and provided insights into areas requiring improvements based on student performances.

CQI Division Meetings:

Following the presentation, the event continued with Continuous Quality Improvement (CQI) meetings, organized according to the four divisions within the faculty; STRUCM, GEOTREN, CEPM, and WRES. These meetings aimed to facilitate focused discussions tailored to the specific courses under each division. Lecturers engaged in collaborative dialogue to enhance teaching methodologies, refine assessment strategies, and improve overall course content. The goal was to ensure stronger alignment with program outcomes and accreditation standards.

STRUCT Division

GEOTREN Division

CEPM Division

WRES Division

Conclusion:

The CDL-CQI Day 2.0 concluded with a fruitful exchange of ideas aimed at enhancing the quality of the academic programs at UiTMCPP. By actively involving all faculty members, the event emphasized the importance of continuous improvement to ensure that students meet the expected learning outcomes and that the programs adhere to the latest educational standards.

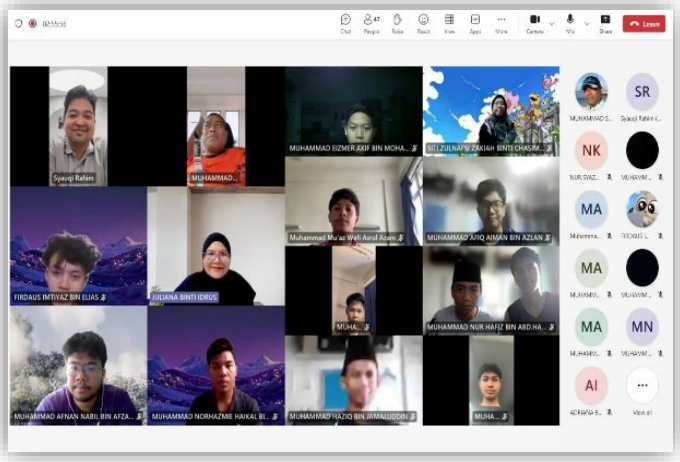
Bridging Theory and Practice – Industry Sharing Session on Soil Compaction and Consolidation

Roziah Keria, Azura Ahmad, Juliana Idrus and Muhammad Sofian Abdullah

On January 18, 2025, a special industry-sharing session was organized for the Soil Mechanics course, focusing on soil compaction and consolidation. Conducted online, the session was open to all students enrolled in the course. It featured a guest speaker, Ir. Wan Ahmad Syauqi Bin Wan Abdul Rahim, a professional engineer from the Public Works Department (JKR).

Ir. Syauqi is a proud alumnus of UiTM Cawangan Pulau Pinang, Permatang Pauh Campus, having graduated in 2018 with a Bachelor of Engineering (Hons.) in Civil (Infrastructure). He achieved his Professional Engineer (Ir.) status in 2023, just five years after graduation, which is a notable accomplishment. He has extensive experience in geotechnical engineering in Malaysia and internationally and has often been invited as a speaker and presenter at various technical seminars and training sessions.

During the session, Ir. Syauqi provided students with a clear and insightful experience of the practical application of soil compaction and consolidation in real-world engineering projects. He shared real challenges faced on construction sites and the decision-making processes involved. This helped students connect classroom theories to actual field practices.



His engaging and informative presentation offered students a valuable opportunity to understand how theoretical knowledge is translated into real-life engineering work. The session was eye-opening, relevant, and inspiring as it gave students a clearer picture of their future careers in geotechnical engineering.

Sessions like this play an important role in strengthening students' understanding by integrating real industrial experiences into academic learning. They inspire students to think beyond textbooks and prepare them to face real-world engineering challenges with greater confidence. Overall, the session successfully bridged the gap between theory and practice and served as an excellent platform for students to gain industry-relevant knowledge and insights.

Inspirasi dan Kepimpinan P'CES: Menyantuni Remaja Sekolah Tunas Bakti Teluk Air Tawar, Pulau Pinang

Ts. Zanariah Abd Rahman, Dr. Zul Azmi Mokhtar, Ir. Ts. Fairus Azwan Azizan, Mohd Khairul Azhar Ismail

Kelab Penang Civil Engineering Student's Society (P'CES) telah menganjurkan Program Tunas Bakti yang bertarikh 7 Disember 2024 bermula jam 9 pagi sehingga 5 petang di Sekolah Tunas Bakti Teluk Air Tawar, Butterworth, Pulau Pinang. Program ini bertujuan memberikan bimbingan dan suntikan motivasi kepada pelajar Sekolah Tunas Bakti Teluk Air Tawar yang disertai oleh 40 orang pelajar. Pelajar sekolah tersebut telah dibimbing oleh 36 orang fasilitator yang terdiri daripada pelajar kelab P'CES dan diketuai oleh Pengarah Program iaitu Ikhmal Firdaus bin Norhisyam.

Turut hadir memberikan sokongan sepanjang program ialah empat orang pensyarah dari Fakulti Kejuruteraan Awam yang memainkan peranan sebagai pemandu arah dan penasihat program, iaitu Ts. Zanariah bt Abd Rahman, Dr. Zul Azmi bin Mohtar, Ir. Ts. Fairus Azwan bin Azizan, dan Mohd Khairul Azhar bin Ismail.

Antara aktiviti utama yang dijalankan bersama pelajar sekolah adalah ceramah motivasi yang memberi panduan kepada pelajar untuk menghadapi cabaran hidup secara positif dan proaktif, serta Latihan Dalam Kumpulan (LDK) yang memfokuskan kepada pembangunan sahsiah, kemahiran komunikasi, dan keyakinan diri. Semua aktiviti telah berjalan dengan lancar hasil kerjasama erat di antara fasilitator dan pelajar sekolah serta tenaga pengajar.

Program ini melabuhkan tirainya dengan majlis penutup yang diserikan oleh kehadiran Timbalan Pengetua Sekolah Tunas Bakti, Cikgu Sazalimi bin Mohamad, serta Ts. Dr. Samsudin bin Abdul Hamid selaku Ketua Program (Diploma), Fakulti Kejuruteraan Awam, UiTM Permatang Pauh.

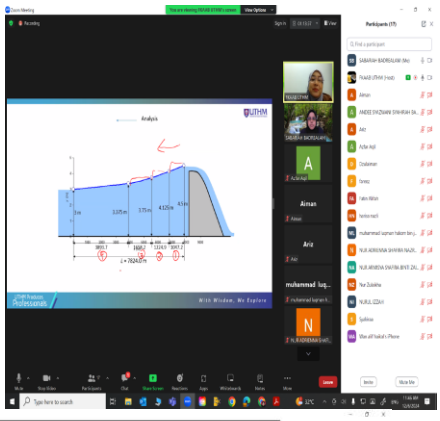
Secara keseluruhannya, Program Tunas Bakti ini bukan sahaja membuka ruang kepada pelajar sekolah untuk mengenal potensi diri, malah memberi pengalaman berharga kepada fasilitator dalam mengasah kemahiran kepimpinan dan komunikasi. Bagi pihak UiTM Permatang Pauh, program seperti ini merupakan manifestasi komitmen terhadap tanggungjawab sosial dan penglibatan komuniti (community engagement) yang menjadi salah satu teras penting dalam pendidikan holistik. Ia juga mencerminkan keupayaan pelajar kelab P'CES di Fakulti Kejuruteraan Awam, UiTM Permatang Pauh untuk menjadi agen perubahan yang menyumbang secara aktif kepada pembangunan masyarakat. Diharapkan program ini dapat diteruskan dan dikembangkan demi menyemai nilai-nilai murni serta mencorakkan generasi muda yang lebih berdaya tahan dan berinspirasi.

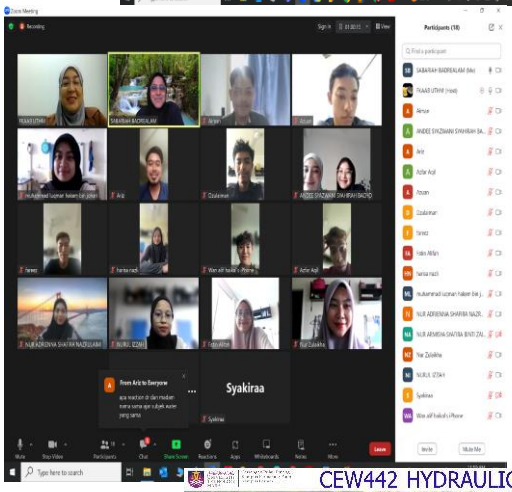
PENGALAMAN MENGENDALI PENGAJARAN KOLABORATIF BAGI KOD CEW442 SEMESTER 20242 BERSAMA PENSYARAH TAMU UTHM

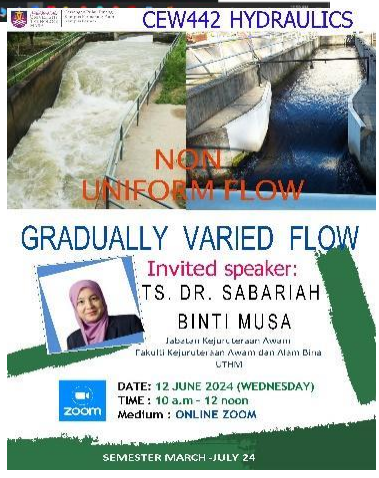
Sabariah Binti Badrealam

Pengajaran Kolaboratif ataupun Collaborative Teaching merupakan salah satu kriteria yang diambil kira semasa penilaian Sasaran Kerja Tahunan bagi setiap pensyarah di UiTM ini. Oleh yang demikian, setiap tahun akan diadakan kerjasama di antara pihak UiTM dan organisasi luar. Untuk merealisasikan pengajaran kolaboratif ini, bermulalah beberapa prosedur termasuklah pendaftaran CGCT secara atas talian, pencarian penceramah dan menghantar laporan CGCT kepada pihak CIDL. Inilah pengalamanku sebagai pensyarah untuk mengendalikan pengajaran kolaboratif ini termasuklah, menyediakan surat jemputan kepada pihak luar, di mana perbincangan berlaku terlebih dahulu melalui Whatsapp dan email bagi menetapkan tarikh, waktu dan tajuk yang sesuai sebelum surat jemputan menyusul kepada penceramah. Pada tanggal 12hb Jun 2024 jam 10 pagi di medium ZOOM satu perkongsian ilmu yang bertajuk Non Steady Flow (Gradually Varied Flow) telah berlangsung secara atas talian bersama Ts Dr. Sabariah Binti Musa dan 17 orang pelajar. Penceramah tamu yang dijemput ini, merupakan salah seorang pensyarah kanan di Jabatan Kejuruteraan Awam, Fakulti Kejuruteraan Awam Dan Alam Bina, Universiti Tun Hussein Onn Malaysia yang berpengalaman melebihi 20 tahun dalam pengajaran. Pada semester ini, pelajar yang mendaftar kod CEW442 tidaklah ramai kerana kod ini ditawarkan kepada ambilan matrikulasi dan politeknik sahaja.

Melalui pengajaran kolaboratif ini, para pelajar dapat menambahkan ilmu pengetahuan dalam pejalaran dan dapat juga bersilaturahim bersama pensyarah dari universiti luar. Sesi perkongsian ilmu ini berjalan selama 2 jam, diawali dengan introduction of non steady flow dan juga beberapa contoh soalan yang berkaitan dengan tajuk yang dikongsikan. Di akhir sesi ini, beberapa tugasan telah diberikan kepada para pelajar bagi memantapkan ilmu yang di kongsikan. Semoga dengan adanya pengajaran kolaboratif ini secara tidak langsung ia dapat meluaskan lagi jaringan industri pendidikan di UiTM dengan agensi luar . Beberapa keping gambar dan poster yang sempat di kongsikan sepanjang sesi pengajaran ini.







Langkah Ke Menara Ilmu

Muriatul Khusmah Musa, Mohamad Zain Hashim

Langit pagi itu cerah di Universiti Sri Wawasan. Dari jauh kelihatan para pelajar berjalan pantas menuju ke dewan kuliah, ada yang masih menguap kepenatan, ada juga yang sibuk menyiapkan tugasan saat akhir. Di satu sudut kampus, seorang pelajar tahun pertama bernama Hana menatap senarai kelas minggu itu sambil menarik nafas panjang.

Hana datang dari keluarga sederhana di kampung. Ayahnya seorang penoreh getah, ibunya sudah lama meninggal dunia. Kakaknya bekerja di kilang untuk membantu keluarga, sementara abang dan adik masih bersekolah. Harapan keluarga kini terletak pada bahunya untuk berjaya di universiti dan membawa perubahan kepada kehidupan mereka.

Permulaan Yang Menggentarkan

Pada minggu pertama kuliah, Hana berasa terasing dan tercabar. Segalanya terasa asing bangunan besar, istilah akademik yang rumit, tugasan bertulis, dan kuliah tiga jam yang penuh nota serta perbincangan kritikal.

“Ayah, Hana takut Hana tak mampu,” katanya dalam telefon suatu malam, suara lemah menahan sebak.

Di hujung talian, suara ayahnya tenang namun penuh harapan.

“Hana, menara ilmu tu takkan roboh kalau Hana terus mendaki. Ingat, Hana bukan berjalan seorang. Ramai akan bantu kalau Hana minta.”

Kata-kata itu menjadi kekuatan kepada Hana.

Peluang Kedua: Program CANTAS GAGAL

Minggu keempat, keputusan kuiz pertamanya diumumkan. Hana gagal dua subjek. Hatinya luluh. Ketika dia duduk termenung di kafeteria, seorang pensyarah muda, Dr. Alia, menyapanya.

“Hana, saya tengok nama awak dalam senarai pelajar yang layak menyertai program CANTAS GAGAL. Awak tahu tentang program tu?”

Hana menggeleng.

“Itu program khas universiti untuk bantu pelajar yang tercicir atau hampir gagal. Awak akan dibimbing oleh penasihat akademik, kaunselor dan pelajar senior. Kita bukan nak hukum, kita nak bantu.”

Walaupun malu, Hana mendaftar. Dalam program itu, dia dibimbing oleh seorang kaunselor, Puan Shima, yang membantunya menyusun emosi dan tekanan. Penasihat akademik pula, Profesor Zaki, membantu merancang jadual ulang kajinya. Dia juga dipasangkan dengan seorang pelajar senior, Fatin, yang pernah gagal tetapi kini menjadi pelajar cemerlang.

Transformasi Diri

Di bawah bimbingan program itu, Hana mula belajar mengurus masa dengan lebih baik. Dia menghadiri sesi bimbingan setiap minggu, menyertai kumpulan belajar, dan tidak malu bertanya. Walaupun hari-harinya padat, dia mulai merasakan perubahan.

Suatu hari, dalam kelas Dr. Alia, Hana bangkit menjawab soalan yang dia tidak berani suarakan sebelum ini. Rakan sekelas memandang dengan kagum, dan Dr. Alia hanya tersenyum puas.

“Inilah semangat pelajar universiti. Belajar dari kesilapan, dan bangkit lebih kuat.”

Sokongan Dari Jauh

Walaupun jauh di kampung, keluarga Hana sentiasa menjadi sumber kekuatannya. Kakaknya sering mengirim sedikit wang walaupun tidak banyak, dan abangnya menghantar pesanan ringkas yang melucukan, hanya untuk membuat Hana tersenyum.

Satu malam, selepas berjaya membentangkan projek pertamanya, Hana menghantar gambar kepada ayahnya.

"Ayah, Hana berjaya bentang projek depan kelas! Semua tepuk tangan!"

Balasan ayahnya ringkas, namun cukup menyentuh hati.

"Alhamdulillah. Jangan lupa niat belajar tu, nak bantu keluarga suatu hari nanti. Kami tunggu kejayaan Hana."

Minggu-Minggu Mencabar

Mengharungi 14 minggu di universiti bukanlah sesuatu yang mudah. Ada waktu Hana jatuh sakit, ada ketika dia merasa lelah dan hilang semangat. Namun, setiap kali dia ingin menyerah, dia akan duduk semula dan menulis kata-kata ayahnya di dinding asrama: "Menara ilmu tidak akan roboh kalau aku terus mendaki."

Dia juga sering mengunjungi pusat kaunseling apabila tekanan terlalu berat. Di sana, dia belajar teknik pernafasan, pengurusan stres, dan yang paling penting bahawa meminta bantuan bukan tanda kelemahan, tapi kekuatan.

Akhir Sebagai Permulaan

Minggu keempat belas akhirnya tiba. Tugasan terakhir dihantar, pembentangan selesai, dan kuliah terakhir berlangsung dalam suasana syahdu.

Dr. Alia menutup kelas dengan kata-kata yang tidak akan dilupakan Hana:

"Universiti bukan sekadar tempat cari gred. Ia tempat awak kenal siapa diri awak. Jatuh, bangkit, dan teruskan perjalanan. Sebab dalam dunia sebenar nanti, awak akan terus diuji."

Hana berdiri di luar dewan kuliah, memandang ke langit biru. Dia tersenyum, bukan kerana segalanya mudah, tetapi kerana dia tahu dia sudah bertahan. Dan lebih penting lagi, dia tahu ke mana dia sedang menuju ke masa depan yang lebih baik, bukan hanya untuk dirinya, tetapi untuk keluarganya.

Pengajaran

Kisah ini adalah kisah ribuan pelajar di universiti awam yang datang dengan harapan, teruji oleh cabaran, dan berjaya kerana tidak berputus asa. Bantuan seperti penasihat akademik, kaunseling, dan program seperti CANTAS GAGAL wujud untuk mereka yang sanggup bangkit dari kegagalan. Untuk semua pelajar universiti di luar sana: ingatlah bahawa anda tidak keseorangan. Minta bantuan bila perlu, urus masa dengan bijak, dan jangan lupa sebab utama anda berada di sini untuk menimba ilmu dan mengubah masa depan. Setiap minggu yang anda harungi adalah satu langkah lebih dekat ke arah impian anda.

"Teruskan mendaki menara ilmu—kerana di puncaknya, ada cahaya untuk diri dan keluarga."

Enhancement Clinic: Geology Gets a Boost!

Juliana Idrus, Khairul Afinawati Hashim, Mohd Khairul Azhar Ismail and Nur Masyitah Osman

On Saturday, 29 June 2024, an enhancement clinic for the Geology subject (ECG253) was successfully held at the Dewan Seminar, UiTM Cawangan Pulau Pinang, from 2.00 PM to 6.00 PM. Organized by the Geology (ECG253) lecturers, the session was attended by all Semester 2 CEEC110 (Diploma in Civil Engineering) students.

The session offered a focused and interactive platform for students to strengthen their understanding of geology fundamentals. Through a mix of mini-lectures, hands-on exercises, and Q&A segments, the clinic addressed common areas of difficulty while encouraging active participation and engagement.

Students welcomed the opportunity to interact directly with their lecturers in a more relaxed and supportive environment. Many shared that the clinic helped them better connect theoretical knowledge with practical applications, making the subject more accessible and meaningful.

Overall, the enhancement clinic proved to be a productive and enriching afternoon, boosting both knowledge and confidence. Similar sessions are planned for the future to continue supporting students in mastering their core subjects.

Empowering Conservation and Academic Triumph: My Inspiring Journey on Hari Sungai Sedunia”

Dr. Intan Shafeenar Ahmad Mohtar

Hari Sungai Sedunia, or World Rivers Day, is celebrated on **21st September 2024**. This global event aims to raise awareness about the importance of rivers and promote their conservation. This year, the celebration was particularly special for me as it marked a significant milestone in my academic journey.The highlight of the event was improving the quality of the river through conservation efforts and increasing public awareness about the importance of river conservation.

Submitting My PhD Thesis

Coinciding with Hari Sungai Sedunia, I also reached a significant academic milestone: the submission of my PhD thesis.

Overcoming Challenges During Thesis Writing

The journey to completing my thesis was not without its challenges. I struggled with organizing my thoughts and structuring my writing. To overcome this, I met with my supervisor every day to discuss my progress. We went through my writing line by line, crafting each sentence together so that the flow of writing is synchronize and was able to be understand by other researcher. This collaborative effort was crucial in helping me finish my thesis.

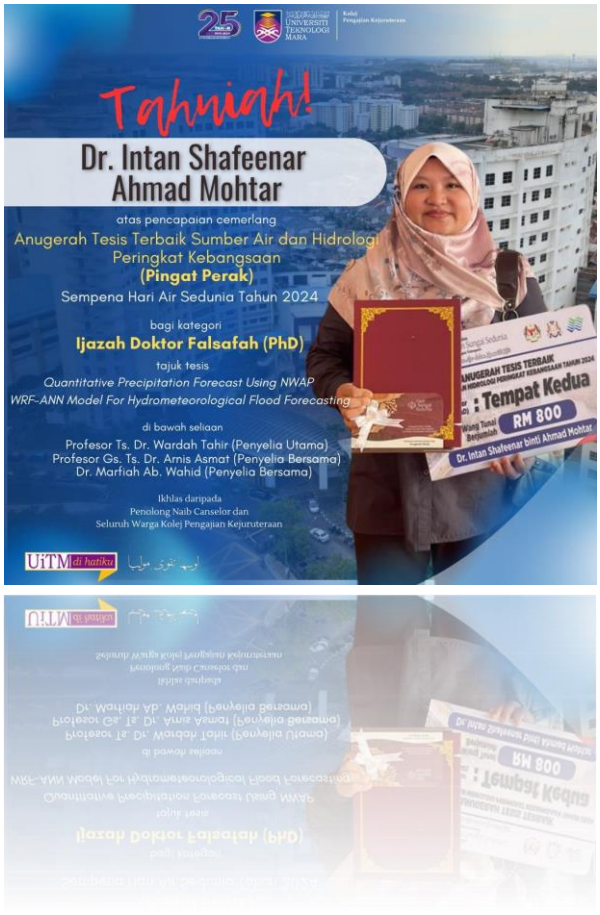
The award ceremony

Winning the Silver Award

I was honoured to receive the “Anugerah Tesis Terbaik” (Best Thesis Award) in the Doctor of Philosophy (PhD) category in conjunction with World Rivers Day 2024. The prize presentation ceremony was officiated by The Deputy Prime Minister and Minister of Energy Transition and Water Transformation (PETRA), YAB Dato' Sri Haji Fadillah bin Haji Yusof, together with the YAB Tuan Ling Tian Soon, Chairman of the Health and Environment Committee of Johor State, the official representative of YAB Dato’ Onn Hafiz bin Ghazi, the Chief Minister of Johor. The thesis, titled "Quantitative Precipitation Forecast Using NWP WRF-ANN Model for Hydrometeorological Flood Forecasting".

Winning the silver award for my thesis was an acknowledgement to the hard work and dedication I have put into my research. This recognition has further motivated me to continue my efforts in advocating for sustainable river management. The award ceremony took place at Sungai Tebrau, Johor Bahru, Johor.

The award ceremony took place at Sungai Tebrau, Johor Bahru, Johor.



A Message of Motivation

I hope my journey inspires others who are working on their thesis or any challenging projects. Remember, persistence and seeking guidance can make a significant difference. If you face difficulties, don't hesitate to reach out for support and work through your challenges step by step. Your efforts will pay off, and you can achieve great things. Please remember to never give up and to continue moving forward, no matter how challenging it is, and have confidence that there will be sunshine even during miserable days. Challenges will make you stronger and more determined to give the greatest effort in anything.

Looking Ahead

Participating in “Hari Sungai Sedunia” and submitting my PhD thesis have been deeply rewarding experiences. They have reinforced my commitment to environmental conservation and inspired me to continue advocating for sustainable river management. I hope that my research and involvement in such events will encourage others to recognize the vital role rivers play in our lives and take action to protect them. As we celebrate Hari Sungai Sedunia, let us remember that every small effort counts. Whether it's participating in a clean-up drive, planting trees, or simply spreading awareness, we can all contribute to the preservation of our precious rivers.

Program Jelajah Kasih 2.0

Ir. Ts. Fairus Azwan bin Azizan, Ts. Zanariah binti Abd Rahman dan Mohd Khairul Azhar bin Ismail

Pada 15 Disember 2024 yang lalu, Program Jelajah Kasih 2.0 telah sempurna dilaksanakan di Masjid Jamek Al-Muhtadiin, Bukit Indera Muda, Pulau Pinang. Program ini adalah anjuran kelab Penang Civil Engineering Student's Society (P'CES) dibawah naungan Pengajian Kejuruteraan Awam (PKA). Seramai 35 orang peserta dari kelab P'CES telah mengambil bahagian dalam program ini yang diketuai oleh Siti Nursyahindah Binti Mohd Shafar bertujuan untuk memupuk semangat kesukarelawanan dalam diri pelajar UiTM. Turut memberi sokongan, 3 orang pensyarah merangkap penasihat kelab iaitu Ir. Ts. Fairus Azwan bin Azizan, Ts. Zanariah binti Abd Rahman dan Mohd Khairul Azhar bin Ismail.

Antara aktiviti utama program ini ialah membersihkan dan menceriakan kawasan masjid, memberikan sumbangan kepada golongan asnaf dan menyantuni golongan asnaf yang uzur serta menghulurkan sumbangan secara terus kepada mereka.

Majlis penutup program ini telah disempurnakan dengan kehadiran Timbalan Rektor Hal Ehwal Pelajar UiTM Cawangan Pulau Pinang, Dr. Ahmad Asri Abd Samat, Pengerusi Masjid, Tn. Hj Azizan Bin Ismail dan penyumbang utama program, Ustaz Zulhazwan Ismail wakil dari syarikat Rasniaga Sdn. Bhd. dan Napie Burger Enterprise.

Dengan terlaksananya program ini, para pelajar dapat menerapkan nilai-nilai murni dan semangat kerjasama dalam menyempurnakan tugasan yang diberi. Selain itu, dapat menghulurkan bantuan kepada golongan yang memerlukan serta kepada pihak masjid. Semoga dengan usaha ini dapat membentuk para pelajar untuk menjadi masyarakat yang prihatin dan penyayang.

Program CANTAS GAGAL ECW241: Memacu Kejayaan dalam Kursus Hidraulik

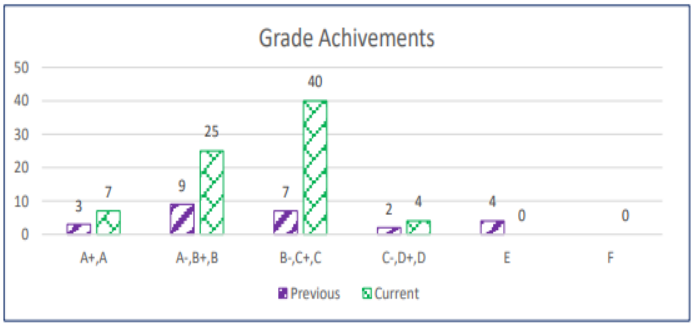
Amalina Amirah binti Abu Bakar, Satira Hambali dan Amir Khomeiny Ruslan

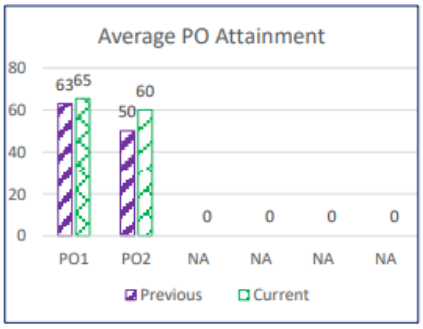
Program CANTAS GAGAL (ECW241), yang diwajibkan Kepada seramai 71 pelajar Diploma CEEC110 semester 4, telah berjaya dilaksanakan dengan dua sesi utama pada semester 20242 iaitu pada 17 Mei dan 5 Julai 2024. Program ini bertujuan untuk meningkatkan prestasi pelajar dalam kursus Hidraulik melalui pendedahan kepada teknik menjawab soalan yang efektif dan persediaan menghadapi peperiksaan akhir.

Bagi sesi pertama, seminggu sebelum program bermula, pelajar diberikan tugasan pra-ujian Hidraulik. Pada sesi pertama, tumpuan diberikan kepada perbincangan mendalam mengenai jalan kerja yang tepat untuk menjawab soalan pra-ujian. Pelajar didedahkan dengan strategi untuk mencapai markah penuh dan menerima maklum balas konstruktif daripada pensyarah. Pada akhir sesi, pelajar menerima markah sebenar pra-ujian mereka.

Sesi kedua memfokuskan kepada persediaan menghadapi peperiksaan akhir. Pelajar diberi pendedahan kepada format dan contoh soalan peperiksaan akhir lepas. Para penceramah, yang merupakan pensyarah berpengalaman lebih 10 tahun, berkongsi "tips & tricks" serta "common mistakes" dalam menjawab soalan Hidraulik. Program ini diadakan bagi memberi pendedahan awal kepada pelajar berkenaan ‘standard’ soalan peperiksaan sebenar dan meningkatkan keyakinan mereka.

Program CANTAS GAGAL (ECW241) telah menunjukkan impak yang positif dengan peningkatan peratusan pelajar yang lulus. Selain itu, program ini juga menyumbang kepada peningkatan peratusan Pencapaian Hasil Program (PO) pelajar. Program ini telah berjaya memberi manfaat kepada pelajar dalam memahami konsep teori dan analisis aliran air dalam paip. Diharapkan program ini dapat diteruskan untuk membantu lebih ramai pelajar mencapai kejayaan dalam kursus Hidraulik.





Fire Rating Test of Precast Concrete Wall Panel Made from Waste Materials

Noorsuhada Md Nor, Soffian Noor Mat Saliah, Amril Hadri Jamaludin, Amir Khomeiny Ruslan, Ahmad Syauqi Md Hassan, Mohd Azrizal Fauzi

The fire rating test of precast concrete wall panel made from waste materials project was successfully carried out through a collaboration between UiTM and the Public Works Department (JKR). The main objective was to evaluate the fire resistance performance of precast concrete wall panels produced using waste materials. This study emphasised both fire safety and sustainability, aligning with the national agenda to reduce reliance on conventional raw materials while promoting circular economy practices in construction.

The fire test was conducted in accordance with international standards, where the panel was exposed to high temperatures in a specialised furnace to assess their structural integrity and resistance time. The results revealed that the waste based precast concrete panel was able to withstand heat exposure for more than two hours before significant structural failure occurred. This performance was comparable to conventional panels, proving that the use of waste materials does not compromise essential safety requirements. The total cost incurred for this project was approximately RM 40,000, covering all important aspects to ensure this project can be accomplished.

The project was successfully completed and has certified from SIRIM Sdn. Bhd. This project has provided positive insights for the construction industry, particularly in terms of safety and sustainability.

Civil Tigers : Juara Futsal SAF 2024

Ir. Ts. Fairus Azwan Azizan

Kejohanan Sukan Antara Fakulti (SAF) 2024 UiTM Cawangan Pulau Pinang bagi pasukan futsal telah berlangsung pada 9 November 2024 yang lalu di mana ia disertai oleh 8 pasukan termasuk Pengajian Kejuruteraan Awam (PKA). Perlawanan ini berlangsung di gelanggang futsal kolej Zamrud di mana pada peringkat kumpulan, pasukan PKA menghadapi laluan mudah menentang PKM (1-1), PKE (3-1) dan PPT (5-0). Pasukan PKA menjadi johan kumpulan dan mara ke separuh akhir.

Pada peringkat separuh akhir, pasukan PKA berjaya menjinakkan lawan iaitu daripada Fakulti Sains Kesihatan (FSK) dengan jaringan 2 gol tanpa balas. Bagi aksi perlawanan akhir, pasukan PKA bertemu dengan Pengajian Kejuruteraan Kimia (PKK) apabila mereka juga layak setelah menewaskan PKE diperingkat separuh akhir.

Aksi peringkat akhir agak sengit diantara PKA dan PKK apabila sekadar seri 1-1 sehingga tamat permainan. Juara di tentukan dengan penentuan sepakan penalti. PKA sekali lagi menunjukkan aksi hebat apabila berjaya menundukkan PKK dengan jaringan 3 berbalas 1 seterusnya dinobatkan sebagai juara futsal SAF bagi edisi 2024.

Civil tigers (PKA) di bawah kendalian Ir Ts Fairus Azwan Azizan sebagai pengurus pasukan telah berjaya merangkul pingat emas untuk PKA. Tahniah diucapkan kepada para pemain, pegawai dan seluruh pasukan futsal PKA yang terlibat.

Experience and Insight : Canada-ASEAN Exchanges Program

Ts. Hafizah Muhamad Azlan

Ts. Hafizah is a senior lecturer at UiTM Pulau Pinang and is currently taking a break from teaching to focus on her PhD studies. While working on her degree, she received the Canada-ASEAN Scholarship and Educational Exchanges for Development (SEED) from the Canadian Bureau for International Education. This awesome scholarship allowed her to spend six months as a Visiting Research Student (VRS) at the University of Ottawa, Canada, from January to June 2024.

This program, offered every year by the Government of Canada, provides students from ASEAN member countries with the opportunity to engage in short-term study or research at Canadian institutions. The scholarships and educational exchanges aim to support the achievement of all sustainable development goals (SDGs) and align with the SEED goals which is to strengthening people-to-people ties between Canada and the Indo-Pacific region.

Therefore, to qualify for the scholarship, students must apply and meet certain requirements, including having their local university partnered with the Canadian institution where they wish to study or conduct research. Luckily, in 2022, our Vice-Chancellor at UiTM established a strategic partnership with the University of Ottawa, making this scholarship opportunity possible!

Ts. Hafizah really made the most of her time during the attachment program, soaking up all the knowledge and experience she could from the university and the area around it. She was guided by Prof. Dr. Ghasan Doudak from the Department of Civil Engineering at the University of Ottawa, who helped her with her research. With his support, she was able to test timber beams and take advantage of the university's top-notch equipment and facilities.

She also got the chance to attend the 2024 Ottawa Wood Solutions Conference organized by the Canadian Wood Council (CWC). It was a great way for her to meet new people in her field and pick up some cool insights about timber structure research. A bunch of pros from the timber industry, including university experts and folks from different sectors, were there.

Figure 1 : Me at University of Ottawa

Figure 2: With some of my friends who are helping in the laboratory.

Figure 3: With some postgraduate students at the work station

While networking at the conference, she hit it off with a postgraduate student from Carleton University in Ottawa. Hence, she had a chance to see the student doing some structure testing in her university and took the chance to look around the campus.

On top of that, she dove into several university programs that enriched her both spiritually and physically. These included online and in-person seminars. She also pushed herself by presenting her research at the Postgraduate Seminar, where Civil Engineering students shared their projects and got helpful feedback from each other. This experience not only boosted her presentation skills but also gave her fresh perspectives on various research areas in her field.

During her time in Canada, she received a warm welcome from the High Commission of Malaysia in Ottawa and built strong connections with fellow Malaysians in the area. She even took part in one of their programs, attending a special screening of Airforce The Movie: Selagi Bernyawa at Cineplex Cinemas Lansdowne, Ottawa which are the initiative to promote Malaysian films in Canada.

Balancing her PhD studies and career wasn't easy, but she gave it her all. While in Canada, she also had the unique chance to celebrate both Eid al-Fitr and Eid al-Adha, experiencing firsthand how these festive occasions differ from back home in Malaysia. Outside of her academic life, she made the most of her time by exploring the country, sightseeing with her family whenever she had the chance.

Overall, spending six months there helped her grow more mature, gain valuable knowledge, and develop essential life skills for navigating challenges.

Figure 4 : While conducting the timber beam bending test

Figure 5: Gathering with Malaysian friends in Ottawa

IFTAR JAMAIE BERSAMA PELAJAR SELIAAN: Sambutan Bulan Rejab 1445H

Khairul Ammar bin Muhammad Ali dan Amalina Amirah binti Abu Bakar

Pada 5 Disember 2024, satu majlis iftar jamaie (berbuka puasa bersama) telah diadakan bagi menyambut kedatangan bulan Rejab 1445H. Majlis ini, yang bertepatan dengan amalan berpuasa sunat hari Khamis, telah dianjurkan khas untuk pelajar-pelajar di bawah seliaan para pensyarah CEEC110, iaitu Ir. Khairul Ammar bin Muhammad Ali dan Puan Amalina Amirah binti Abu Bakar.

Seramai lebih kurang 15 orang pelajar telah hadir memeriahkan majlis yang diadakan di Pusat Islam UiTM Pulau Pinang ini. Selain daripada menikmati juadah berbuka puasa, para pelajar turut berpeluang mendengar taujihat (nasihat agama) yang disampaikan oleh para pensyarah.

Majlis ini bukan sahaja bertujuan untuk menggalakkan amalan berpuasa sunat di kalangan pelajar, tetapi juga sebagai platform untuk mengeratkan silaturahim antara pensyarah dan pelajar. Diharapkan agar program seumpama ini dapat diteruskan di masa hadapan untuk memperkukuhkan lagi hubungan ukhuwah yang terjalin.

eTF-Pengenalan Kepada Fail Pengajaran Pensyarah Secara Dalam Talian

Masyitah Md Nujid, Syahrul Fithry Senin, Mohd Sofian Abdullah, Satira Hambali, Kamsiah Abdul Wahab, Rohamizan Rohim, Ng Wen Kuan dan Faizah Kamarudin

Semester Oktober 2024 – Februari 2025 menyaksikan sekali lagi rutin audit secara berkala dijalankan pada 11 Oktober 2024 sehingga 24 Disember 2024 bagi melihat pematuhan audit kendiri Fail Kursus yang ditawarkan oleh pihak pengurusan Pengajian Kejuruteraan Awam, UiTM Cawangan Pulau Pinang, Kampus Permatang Pauh, Pulau Pinang pada semester sebelumnya iaitu semester Mac 2024 – Ogos 2024. Terdapat sebanyak sepuluh item senarai semak Fail Kursus diantaranya ialah silibus kursus, jadual waktu, perancangan kuliah untuk 14 minggu sesi kuliah berlangsung, bahan pengajaran kursus, penilaian berterusan, penilaian akhir, penilaian pengajaran, penambahbaikan kualiti berterusan dan moderasi pemantauan.

Sebanyak 41 kursus-kursus ijazah sarjana muda pada semester tersebut telah diaudit dan didapati 90% (37 Fail Kursus) telah mematuhi senarai semak Fail Kursus yang ditetapkan oleh pengurusan. Manakala, sebanyak 10% (4 Fail Kursus) tidak mencapai pematuhan senarai semak Fail Kursus. Satu pencapaian yang memberangsangkan apabila audit berkala dijalankan menyaksikan para pensyarah memahami keperluan dalam mematuhi senarai semak Fail Kursus. Audit kendiri penting bagi memastikan jaminan kualiti kursus yang ditawarkan di bawah program ijazah Pengajian Kejuruteraan Awam, UiTM Cawangan Pulau Pinang, Kampus Permatang Pauh, Pulau Pinang.

Pada semester Oktober 2024 – Februari 2025 turut diperkenalkan Fail Pengajaran Pensyarah secara dalam talian (e-TF). e-TF adalah pendekatan dimana setiap individu pensyarah perlu memastikan senarai semak Fail Pengajaran dipatuhi dengan menyediakan setiap dokumen atau bahan bukti pengajaran dalam bentuk salinan lembut (*softcopy*) dan memuatnaik dokumen tersebut secara dalam talian. Para pensyarah boleh menyimpan dokumen Fail Pengajaran mengikut folder seperti yang terdapat dalam senarai semak Fail Pengajaran ke dalam *cloud/drive* persendirian. Fail Pengajaran adalah mekanisma pemantauan secara berkala pengajaran yang telah dilaksanakan oleh pensyarah dalam menjalankan tanggungjawab sebagai pendidik. Oleh itu, e-TF penting memastikan kualiti produk (pelajar) yang dihasilkan melalui pengajaran yang disampaikan oleh pensyarah.

Gambar 1: Kandungan senarai semak Fail Pengajaran

Kick-Start with Confidence: *Motivation Program by Skuad Motivasi dan Pembangunan Pelajar*

Roziah Keria, Prof Madya Dr Noorsuhada Md Nor, Shahreena Melati Rhasbudin Shah, Zuraisah Dollah

To spark enthusiasm at the start of the new academic semester, a Motivation Program was successfully organized by the Skuad Motivasi dan Pembangunan Pelajar on Wednesday, 9 October 2024, at the Dewan Besar, UiTM Cawangan Pulau Pinang, from 3:30 PM to 4:00 PM. The event welcomed Diploma and Bachelor's Degree students and aimed to provide emotional and mental encouragement for a productive semester ahead.

The program focused on boosting students' self-confidence, promoting a positive mindset, and encouraging them to set meaningful goals. It served as an early-semester support initiative to help students kick-start their studies with renewed energy and focus.

The session was led by Mohamad Hafiz bin Kamsani and Puan Nur Fazlin Shazana Mohamad Safiai, Senior Psychology Officer from the Career & Counselling Unit, along with their experienced counselling team. Their engaging and interactive approach made the session relatable, impactful, and inspiring.

Among the topics discussed were academic stress management, maintaining mental well-being, motivation strategies, and building personal resilience. Students were also given the opportunity to engage directly with the speakers and share their thoughts. The program received an excellent response, with many students expressing that the session helped them feel more motivated and mentally prepared for the semester ahead.

FUN AND HANDS-ON LEARNING WITH CDIO IMPLEMENTATION OF CDIO IN FLUID MECHANICS (BUOYANCY & STABILITY)

Satira Hambali, Amir Khomeiny Ruslan, Amalina Amirah Abu Bakar

Buoyancy and Stability plays a crucial role in designing floating structures such as ships, boats, and pontoons. They are not easy concepts to grasp, but CDIO helps students understand them better because it emphasizes hands-on learning, real-world application and problem-solving.

The CDIO assignment given to students in alternate semesters is based on the same topic but differs in the materials used and what needs to be constructed. The students were given the task of:

1) making a raft out of ice-cream sticks (semester Oct'23-Feb'24)
2) making a boat using plastic straws (semester Oct'24-Feb'25)

The assignment was a group-based, with a maximum of four members and must be completed within a week. The process involved brainstorming, designing, analyzing, testing and evaluating buoyancy and stability principles using theoretical and experimental data.

C – Conceive: Brainstorming and Planning

1) Students formed groups and brainstormed ideas on how to construct a raft that can float while maintaining stability and able to support a load of 100 g (semester Oct'23-Feb'24)
2) Students formed groups and brainstormed ideas on how to construct a boat that can float while maintaining stability and able to support a load of 150 g (semester Oct'24-Feb'25)

The students had to understand the Archimedes' Principle and analyze stability factors. Each group had to develop a work plan and draw a flowchart indicating the processes needed to complete the task.

D – Design: Structural Design and Theoretical Analysis

The groups then proceeded with detailed design, including sketching the object, included a Free Body Diagram to analyze forces on the object, as well as equations and calculations involved.

I – Implement: Building and Testing of Models

The raft/boat models were then tested in a water tank, held at the Hydraulics Laboratory. Observations include the floating capability and stability when weight was added. The depth of immersion was recorded each time weight was added, till the raft/boat capsized.

O – Operate: Evaluation and Discussion

Finally, the groups compared their theoretical and experimental results, analyzed the discrepancies between the expected and actual performance, discussed stability issues or design limitations and suggested possible improvements.

By applying the CDIO framework to Fluid Mechanics, students gain hands-on experience with buoyancy and stability. These assignments enhanced problem-solving skills, encouraged teamwork and strengthened their practical understanding of fundamental engineering principles. Overall, as an educator who observed these processes, I can say that the students really had a great time doing these assignments, especially when it comes to testing their models.

Semester Oct'23-Feb'24
Task: Making a raft out of ice-cream sticks

Semester Oct'24-Feb'25
Task: Making a boat using plastic straws

Projek Penyelidikan Geoteknikal: Kerja Lapangan JKR Probe di Politeknik Bagan Datuk, Perak

Azura Ahmad, Dr. Anas Ibrahim, Badrul Nizam Ahmad, Dr. Juhaizad Ahmad

Pada 23 hingga 24 Disember 2024, satu aktiviti lawatan dan kerja lapangan telah berjaya dilaksanakan di kawasan Politeknik Bagan Datuk, Perak. Aktiviti ini melibatkan beberapa orang pensyarah pengiring serta pelajar projek tahun akhir (FYP) daripada Pengajian Kejuruteraan Awam (PPKA), UiTM Cawangan Pulau Pinang.

Tujuan utama aktiviti ini adalah bagi melaksanakan kajian penyelidikan hasil kolaborasi antara PPKA UiTM Cawangan Pulau Pinang dan Perunding Consulface Sdn. Bhd. Kerjasama strategik ini telah dimeterai menerusi satu Memorandum Persefahaman (MoU) antara kedua-dua pihak, yang bertujuan mengukuhkan jaringan penyelidikan dalam bidang kejuruteraan geoteknikal.

Objektif Aktiviti

Objektif utama lawatan dan kerja lapangan ini adalah:

1. Memperoleh data sokongan bagi tujuan penyelidikan bertajuk *"Verification of Ground Improvement & Site Investigation Results from Pile Driving Analyzer (PDA) Test"*.
2. Memberikan pendedahan dan pengalaman secara praktikal (hands-on) kepada pelajar projek tahun akhir dalam menjalankan ujian lapangan serta menganalisis data yang diperoleh.

Pelaksanaan Kerja Lapangan

Kajian penyelidikan yang dijalankan berfokus kepada *"Verification of Ground Improvement & Site Investigation Results from Pile Driving Analyzer (PDA) Test"*. Bagi tujuan ini, peralatan *JKR Probe* telah digunakan bagi menjalankan ujian dan siasatan tanah di beberapa lokasi strategik dalam kawasan politeknik.

Antara lokasi-lokasi ujian yang telah dipilih adalah:

- Kawasan Padang
- Bangunan Pentadbiran

Rumusan Aktiviti

Secara keseluruhannya, lawatan dan kerja lapangan ini telah berjalan dengan lancar serta mencapai objektif yang telah ditetapkan. Pelaksanaan ujian menggunakan peralatan *JKR Probe* telah berjaya memperoleh data yang berkualiti tinggi. Data yang dikumpulkan ini akan digunakan bagi menyokong kajian penyelidikan bersama antara PPKA UiTM Cawangan Pulau Pinang dan Perunding Consulface Sdn. Bhd., seterusnya menyumbang kepada pembangunan ilmu pengetahuan dalam bidang penyiasatan geoteknikal dan penambahbaikan tanah.

Sesi taklimat oleh wakil pengurusan Politeknik Bagan Datuk kepada peserta lawatan.

CERITERA KELAS YANG HILANG: MADAM RINDU ZAMAN OHP

Faizah Kamarudin

OHP? Apa tu? Madam hanya mampu tersenyum bila pelajar bertanya. Mari kita selami perjalanan madam menongkah arus teknologi!

Segalanya bermula pada tahun 1999, hari pertama madam mengajar. Penuh semangat, tetapi ada satu masalah besar - OHP berat! Setiap minggu, madam terpaksa meminta wakil kelas untuk mengangkatnya. Itu baru cabaran pertama, hehe!

Mengajar dengan OHP bukan semudah letak helaian dan hanya bercakap. Madam perlukan plastik transparensi dan pen *marker* khas. Silap tulis? Nasib baik ada cecair *remover*, tapi kalau padam terlalu kerap, plastik jadi comot. Pelajar pun perlu menyalin nota satu per satu. Walaupun nampak 'leceh', mereka lebih fokus. Terbaik, kan?

Tapi ada juga situasi lucu. Pernah madam letak helaian terbalik, habis satu kelas membaca nota dalam keadaan *mirror effect*! "Madam, nota terbalik!" Aduh, malu!

Kemudian, muncul LCD projektor. Alhamdulillah, tak perlu angkut OHP! Dengan *PowerPoint*, madam boleh masukkan gambar dan animasi. Tapi, oh tidak! Sekarang pelajar malas menyalin nota. Dulu mereka aktif, sekarang hanya tunggu slaid dimuat naik.

Lalu datang era *e-learning*. Madam mula menggunakan *i-Learn* (sekarang dipanggil *UFUTURE*) untuk berkongsi nota. Mudah, cepat, dan tak perlu bawa *pendrive*. Namun, interaksi dalam kelas semakin berkurang. Dulu, madam bertanya soalan, sekarang pelajar ambil gambar dan senyap. Kadang terasa mereka ambil gambar madam pula. Opss!

Pandemik tiba, bilik kuliah 'hilang'. Kelas jadi Google Meet dan Zoom. "Madam, internet *slow*!" dan "*mic* saya rosak lah!" menjadi lagu baru. Diakhir kelas, semua ucap terima kasih secara berjemaah bagai ciapan burung-burung, padahal sepanjang kelas diam seribu bahasa. Mungkin mereka percaya, "Jika sekiranya diam itu bijak, lakukanlah!." Hahaha!

Madam mula rindu kelas fizikal. Rindu pelajar menyalin nota dan bertanya soalan secara langsung. Tetapi, pendidikan mesti diteruskan, walau dalam apa jua keadaan. Kita boleh!

Kini, kita berada di era AI. Madam boleh guna ChatGPT untuk menjana soalan kuiz dalam beberapa saat. Jeng jeng! Namun, tiada teknologi yang boleh menggantikan peranan seorang pendidik.

Madam tetap rindu zaman OHP, bukan kerana teknologinya, tetapi nilai pembelajaran yang lebih mendalam. Dulu risau transparensi comot, sekarang risau internet *hang*. Dulu minta wakil kelas angkat OHP, sekarang minta mereka '*mute*' mikrofon. Dulu, pelajar menyalin nota dengan penuh fokus, sekarang mereka *screenshot* nota dan terus simpan dalam telefon atau *tablet*.

Satu perkara tidak pernah berubah: keinginan untuk mendidik. Teknologi boleh berubah, tetapi jiwa seorang pendidik tetap sama. Terima kasih OHP, *PowerPoint*, dan AI. Tetapi madam percaya, manusia adalah guru terbaik untuk manusia lain!

Pertandingan *Engineering Art*

Mohd Khairul Azhar bin Ismail, Ts. Zanariah binti Abd Rahman dan Ir. Ts. Fairus Azwan bin Azizan

Kelab Penang Civil Engineering Student's Society (P'CES) telah berjaya menganjurkan *Pertandingan Engineering Art 2024* pada 1 Disember 2024. Pertandingan ini merupakan sebuah acara unik yang menggabungkan elemen kreativiti dan aplikasi teknikal kejuruteraan. Program ini membuka ruang kepada para pelajar untuk menzahirkan kreativiti mereka melalui hasil seni bina kejuruteraan seperti model jambatan dan menara.

Dalam pertandingan ini, peserta dikehendaki mereka cipta struktur jambatan dan menara menggunakan batang sate, selotep dan bahan asas lain mengikut spesifikasi yang telah ditetapkan oleh pihak penganjur. Cabaran ini benar-benar menguji kebolehan peserta dalam merancang, mereka bentuk, dan membina struktur yang kukuh dan stabil dengan bahan yang terhad.

Matlamat utama program ini adalah untuk:

- Memupuk daya inovasi dan kreativiti dalam kalangan pelajar kejuruteraan,
- Meningkatkan kefahaman terhadap konsep asas struktur dan bahan,
- Menerapkan pembelajaran melalui pendekatan amali yang menyeronokkan.
- Memupuk semangat berpasukan dalam menyelesaikan sesuatu masalah

Seramai 35 orang pelajar Diploma dan Ijazah Sarjana Muda Kejuruteraan Awam telah menyertai pertandingan ini. Para peserta telah menunjukkan komitmen yang tinggi, bukan sahaja dari segi kreativiti tetapi juga dalam mengaplikasikan ilmu yang telah mereka pelajari dalam kuliah, seperti kestabilan struktur, pembahagian beban, dan kekuatan bahan. Sepanjang pertandingan berlangsung, pelajar kelihatan seronok dan berganding bahu menyiapkan hasil ciptaan mereka, sekali gus memupuk semangat kerjasama dan komunikasi berkesan.

Poster Program Engineering Art

Proses pembinaan struktur oleh peserta

Sesi ujian ketahanan daya pada struktur

Sesi pembentangan oleh peserta

Program ini mencatatkan kejayaan sebagai program ketiga anjuran P'CES bagi semester ini, sekaligus menunjukkan kelab ini kekal aktif dan komited dalam melahirkan pelajar kejuruteraan yang serba boleh. Majlis penyampaian hadiah telah disempurnakan oleh En. Mohd Khairul Azhar dan Ir. Ts. Fairus Azwan. Ucapan penghargaan turut diberikan kepada semua pihak yang menjayakan program ini, terutamanya barisan jawatankuasa pelaksana yang berdedikasi.

Tahniah kepada semua peserta dan pemenang. Semoga pertandingan seperti ini dapat diteruskan pada masa akan datang sebagai platform membina sahsiah, kemahiran teknikal, dan kreativiti pelajar kejuruteraan awam.

Penilaian oleh Juri

Pemenang pertandingan *Engineering Art*

From Folds to Faults: An Insightful Talk on Structural Geology

Juliana Idrus, Khairul Afinawati Hashim, Mohd Khairul Azhar Ismail and Nur Masyitah Osman

On Wednesday, 12 June 2024, a Technical Talk on Structural Geology was successfully held at Dewan Kuliah Hotel B, UiTM Cawangan Pulau Pinang, from 9.00 AM to 1.00 PM. The event was organized by the Geology (ECG253) lecturers and featured a guest speaker, Ts. Hj. Mohd Mustaqim bin Mohd Nordin, a Council Member of the Society for Engineering Geology and Rock Mechanics Malaysia (SEGRM). With his extensive knowledge and experience, the speaker delivered an enriching session that captivated the audience.

The talk was specially arranged for all Part 2 students of CEEC110 (Diploma in Civil Engineering) who are currently enrolled in the ECG253 subject. It aimed to enhance their understanding of fundamental structural geology topics such as rock deformation, stress-strain relationships, fault and fold mechanics, and the critical role of geology in engineering and geotechnical applications.

The speaker presented the material in an engaging and accessible manner, effectively blending theory with real-world case studies. His approach not only reinforced the concepts taught in class but also provided students with a broader appreciation of how geological structures impact construction and infrastructure projects.

The session concluded with an interactive Q&A segment, during which students enthusiastically posed questions and participated in discussions—reflecting their strong interest and curiosity in the field. Overall, the technical talk was a valuable and inspiring experience, offering students a unique opportunity to bridge academic learning with practical applications. The organisers and participants extend their gratitude to Ts. Hj. Mohd Mustaqim for his insightful sharing, and look forward to more such knowledge-sharing sessions in the future.

RESILIENCE AND SUSTAINABILITY OF HYDRAULIC STRUCTURES: THE ROLE OF NUMERICAL SIMULATION AS AN EARLY WARNING TOOL FOR STRUCTURAL INTEGRITY ASSESSMENT

Ir. Nur Azwa Binti Muhamad Bashar (UiTM & USM), Assoc. Prof. Dr. Mohd Remy Rozaini Bin Mohd Arif Zainol (USM) and Ir. Gs. Ts. Dr. Mohd Rashid Bin Mohd Radzi (TNB Power Generation Sdn. Bhd)

Hydraulic structures such as dams play a major role in the sustainable storage of clean water for daily use, irrigation, flood defence systems and the sustainable supply of electricity generation. Therefore, these structures should be preserved from external and internal impacts, e.g. natural hazards (earthquakes and floods), mechanical vibrations (pumps and turbines), sedimentation due to high velocities and fluid structures (flow-induced vibrations) (Ahmad Mazlan et al., 2020; Al-Obaidi, 2020; Alcocer-Yamanaka et al., 2020; Antoine et al., 2020). The tall and huge dam, which is also ageing and located in an earthquake-prone area with obvious structural deficiencies, is the most affected and prone to catastrophic structural failure (Adamo et al., 2020; Zhuang et al., 2019). Several dam failure events, such as the failure of the Oroville and Toddbrook spillways due to high-velocity water during prolonged rainfall and flooding, flow-induced vibrations due to earthquakes and material fatigue, have highlighted the urgent need for predictive and adaptive approaches to assess dam safety (Balmforth, 2020; France et al., 2018; Goodling et al., 2018; Heidarzadeh & Feizi, 2022; Hollins et al., 2018; Hughes, 2020; Koskinas et al., 2019; Stelloh et al., 2017; Vahedifard et al., 2017; White et al., 2019). Therefore, a well-equipped monitoring system, especially for seismic and structural damage, is crucial as an early warning system and as a basis for the selection of appropriate non-structural or structural measures to extend design and operational life. An example of a well-equipped seismic and structural condition monitoring system is the Cabril Dam in Portugal, which is capable of detecting dynamic vibrations (seismic behaviour during earthquake event) (Oliveira & Alegre, 2020).

The International Committee on Large Dams (ICOLD) has pointed out that high-risk dams must be regularly inspected for structural integrity to ensure the best structural condition and safety. This is supported by the member countries, including Malaysia, through the National Committee on Large Dams (MYCOLD). The management and evaluation of the condition of dams in Malaysia was carried out using the specific checklist of the Malaysia Dam Safety Guidelines (MyDAMS). MyDAMS was prepared by MYCOLD members who are representatives of dam owners, operators, government agencies involved in dam management/issues and dam practitioners in Malaysia. Several dams were inspected and assessed in the Malaysian landscape, including the Muda and Ahning Dams (Kedah), the Jor and Mahang Dams (Perak), the Sultan Abu Bakar Dam (Pahang), the Babagon Dam (Sabah), the Bakun Dam (Sarawak) and the Kenyir Dam (Terengganu). Problems investigated included structural integrity (e.g. concrete cracking and deterioration), soil erosion, landslides and severe collapse potential (BERNAMA, 2023).

Physical assessment on site has traditionally been carried out either manually or automatically using the appropriate system deployed from space (satellite), from the air or the ground (manually or with an advanced system such as a sensor) for static and dynamic monitoring of variables (e.g. water level, temperature, soil settlement, displacement, stress). During the on-site physical assessment, there were limitations to the measurements due to site accessibility, especially in downstream areas such as flooded stilling basins with built-in baffle blocks and outlets for water discharge. In addition, the need for expertise led to an increase in costs and was limited to several inspection periods, which limited the results and analysis and delayed the decision-making process. In addition, several results contain anomalies due to equipment malfunctions and insufficient maintenance work. Due to these limitations, numerical simulation plays an important role in the early prediction of dam failure incidents. Numerical simulation encompasses a range of modelling techniques used to understand and predict the physical behaviour of dam systems under various loading conditions.

The robustness of this tool, which is a powerful complement to physical monitoring systems, allows engineers to simulate failure scenarios that are scarce, or costly to replicate in the field to solve the problem and avoid delays in engineering decisions. Even though the advanced numerical tools are more expensive due to the computational package and simulation time, the robustness can outweigh the cost and provide comprehensive data processing, analysis and visualisation that can improve the decision-making process. Examples of commercial numerical simulation packages are ANSYS, Flow-3D, etc., which provide a robust solution for structural and fluid analysis under either hydrostatic or hydrodynamic conditions with the effect of a single variable or the integration effect between variables (Zaid, 2023; Zhang et al., 2013). Computational fluid dynamics (CFD) is used in flow analysis to simulate complex flow conditions around spillways, spillway gates and stilling basins for erosion and pressure distribution patterns, while finite element analysis (FEA) is used to evaluate structural deformations and stresses. Advanced modelling for coupling analysis, i.e. fluid-structure interaction (FSI), considers the combination between fluid and structural domain using (CFD-FEA) under various conditions (static structure or harmonic motion for dynamic conditions) and is essential for the coupled interaction between hydraulic characteristics of flow (water) and dam structural behaviour, which is important for flow-induced vibration (FIV) and dynamic loading scenarios. The variables selected for dynamic structural analysis are usually natural frequency, operating frequency, damping ratio and stiffness, while dynamic flow analysis includes turbulence intensity, turbulence kinetic energy, hydrodynamic force, hydrodynamic pressure, Froude number, Reynolds number and flow regime.

The numerical simulation results can first be validated with the on-site inspection data (e.g. velocity and water level) or with experimental simulations on a specially constructed physical model based on the actual size of the dam structure (e.g. 1:25, 1:50). The validated data should be within 10%, which shows that the numerical model is good. This satisfactory result of the validation shows that the numerical tools are suitable for future predictions and optimisations (Badoe et al., 2022; Khanjanpour & Javadi, 2020; Zhang et al., 2007). Once the first phase of data validation has been completed, the prediction work can be carried out based on the developed and validated model. This is to ensure that the numerically simulated data and results are reliable and accurate. The simulation time depends on the size of the developed model (e.g. 2D or 3D), the variables (single or multiple effects) and the type of meshing (e.g. tetrahedral, hexahedral) as well as the size of the elements (coarse, medium and fine). In this case, the grid-independent study is performed to determine the most appropriate element type and element sizes for the intended simulation work. The predicted data can be used as informative management to improve the decision-making process regarding the modification of rules and regulations and the appropriate selection of maintenance and rehabilitation works. In addition, the current and future state of structural integrity can be predicted earlier. Subsequent incidents can thus be avoided and minimised.

Simulation-driven approaches support resilience, sustainability and risk mitigation by, firstly, increasing structural reliability by enabling timely reinforcement and retrofitting based on failure predictions. Secondly, by optimising maintenance schedules based on predictive insights, dependency on reactive interventions is reduced. Third, improving the safety aspect relies on early detection of defects or inadequate design and allows conservative but cost-effective design improvements. Fourth, the integration of simulated data with sensor networks that provide real-time simulation enables live modelling via digital twin frameworks. Last but not least, the reduction of socio-economic impact enables early warning that minimises the human and economic consequences of failures.

In conclusion, numerical simulation modelling is of utmost importance for the early prediction of the state of structural integrity both in the present and future state. Moreover, based on the simulation results, structural modifications can be made to accommodate the current situation and updated guidelines. In this way, catastrophic incidents can be avoided and remediation costs minimised. In addition, the whole technical aspect can be taken into account to ensure the resilience and sustainable operation of dams. The integration

of numerical simulations into early warning systems is a decisive step forward in the management of dam-related incidents. These tools support the resilience and sustainability of critical hydraulic infrastructures by simulating complex physical interactions and predicting structural responses to evolving risk conditions. As recent unpredicted natural hazards intensify in the face of climate change impacts and many existing dams approach the end of their service life, the use of simulation-based early warning systems will be essential. Future work should prioritise the development of real-time, data-driven models supported by specific entities (government, private subsidiaries and higher education institutions) in monitoring networks and capacity building.

References

Adamo, N., Al-Ansari, N., Sissakian, V., Laue, J., & Knutsson, S. (2020). Dam Safety: Technical Problems of Ageing Concrete Dams. *Journal of Earth Sciences and Geotechnical Engineering*, *10*(6), 241-279.

Badoe, C. E., Edmunds, M., Williams, A. J., Nambiar, A., Sellar, B., Kiprakis, A., & Masters, I. (2022). Robust validation of a generalised actuator disk CFD model for tidal turbine analysis using the FloWave ocean energy research facility. *Renewable Energy*, *190*, 232-250. https://doi.org/https://doi.org/10.1016/j.renene.2022.03.109

Balmforth, D. (2020). *Toddbrook Reservoir Independent Review Report*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872769/toddbrook-reservoir-independent-review-reporta.pdf

France, J. W., Dickson, P. A., Falvey, H. T., Rigbey, S. J., & Trojanowski, J. (2018). *Independent Forensic Team Report Oroville Dam Spillway Incident*. https://damsafety.org/sites/default/files/files/Independent%20Forensic%20Team%20Report%20Final%2001-05-18.pdf

Goodling, P. J., Lekic, V., & Prestegaard, K. (2018). Seismic signature of turbulence during the 2017 Oroville Dam spillway erosion crisis. *Earth Surface Dynamics*, *6*(2), 351-367. https://doi.org/10.5194/esurf-6-351-2018

Heidarzadeh, M., & Feizi, S. (2022). A cascading risk model for the failure of the concrete spillway of the Toddbrook dam, England during the August 2019 flooding. *International Journal of Disaster Risk Reduction*, *80*, 103214. https://doi.org/https://doi.org/10.1016/j.ijdrr.2022.103214

Hollins, L., Eisenberg, D., & Seager, T. (2018). Risk and Resilience at the Oroville Dam. *Infrastructures*, *3*(4), 49. https://doi.org/10.3390/infrastructures3040049

Hughes, A. (2020). *Report on the Nature and Root Cause of the Toddbrook Reservoir Auxiliary Spillway Failure on 1st August 2019*. D. R. Ltd. https://canalrivertrust.org.uk/refresh/media/thumbnail/41505-report-on-toddbrook-reservoir-by-dy-andrew-hughes.pdf

Khanjanpour, M. H., & Javadi, A. A. (2020). Optimization of the hydrodynamic performance of a vertical Axis tidal (VAT) turbine using CFD-Taguchi approach. *Energy Conversion and Management*, *222*, 113235. https://doi.org/https://doi.org/10.1016/j.enconman.2020.113235

Oliveira, S., & Alegre, A. (2020). Seismic and structural health monitoring of Cabril dam. Software development for informed management [Article]. *Journal of Civil Structural Health Monitoring*, *10*(5), 913-925. https://doi.org/10.1007/s13349-020-00425-0

Stelloh, T., Blankstein, A., Silva, D., & Abdelkader, R. (2017). Oroville Dam Spillway Failure: Nearly 190,000 Ordered to Evacuate. *NBC News Digital*. https://www.nbcnews.com/news/us-news/potentially-catastrophic-tens-thousands-evacuated-amid-dam-spillway-failure-n720051

Vahedifard, F., AghaKouchak, A., Ragno, E., Shahrokhabadi, S., & Mallakpour, I. (2017). Lessons from the Oroville dam [Letter]. *Science*, *355*(6330), 1139-1140. https://doi.org/10.1126/science.aan0171

White, A. B., Moore, B. J., Gottas, D. J., & Neiman, P. J. (2019). Winter Storm Conditions Leading to Excessive Runoff above California's Oroville Dam during January and February 2017. *Bulletin of the American Meteorological Society*, *100*(1), 55-70. https://doi.org/10.1175/bams-d-18-0091.1

Zaid, P. (2023). *Hydraulic Performance of Moderate Stepped Spillway using ANSYS-FLUENT Software*

Zhang, X. Z., Sun, X. N., & Tang, K. D. (2013). Static and Dynamic Analysis of Concrete Gravity Dam by ANSYS. *Applied Mechanics and Materials*, *438-439*, 1334-1337. https://doi.org/10.4028/www.scientific.net/amm.438-439.1334

Zhang, Z., Zhang, W., Zhai, Z. J., & Chen, Q. Y. (2007). Evaluation of Various Turbulence Models in Predicting Airflow and Turbulence in Enclosed Environments by CFD: Part 2—Comparison with Experimental Data from Literature. *HVAC&R Research*, *13*(6), 871-886. https://doi.org/10.1080/10789669.2007.10391460

Zhuang, D., Ma, K., Tang, C., Cui, X., & Yang, G. (2019). Study on crack formation and propagation in the galleries of the Dagangshan high arch dam in Southwest China based on microseismic monitoring and numerical simulation. *International Journal of Rock Mechanics and Mining Sciences*, *115*, 157-172. https://doi.org/https://doi.org/10.1016/j.ijrmms.2018.11.016

Menjejak Kehidupan Tapir di Pusat Konservasi Hidupan Liar

Salina Alias, Nur Masyitah Osman, Zulfairul Zakariah, Rohamezan Rohim

Tapir – si pemalu dari hutan mungkin jarang kita temui, tetapi di Pusat Konservasi Hidupan Liar Sungkai, Perak dan Sungai Dusun Selangor, kami berpeluang mendekati kehidupannya dengan lebih dekat. Di sinil, setiap tapir ada kisahnya tersendiri. Punjut, Cik Li, Mat Liat dan Kapar yang berasal dari Johor, Pahang, Negeri Sembilan dan Selangor adalah antara tapir yang ditempatkan di pusat konservasi. Mereka merupakan sebahagian tapir yang dijumpai mengalami kecederaan atau memerlukan rawatan pemulihan. Ada yang tercedera di kaki, badan dan belakang badan. Sebahagian besar kecederaan berlaku akibat terjerat atau kemalangan lain semasa berada di habitat semula jadi. Tapir yang cedera akan diberi rawatan dan perlindungan, sebelum dikembalikan semula ke habitat asal apabila pulih.

Dalam menyelami kisah tapir yang akhirnya bernaung di pusat konservasi ini membuka ruang untuk kami memahami kehidupan mereka dari sudut yang lebih dekat.

Bukan sahaja tentang sejarah mereka, tetapi juga keperluan semasa mereka di sini seperti saiz kandang yang sesuai, penyediaan makanan yang mencukupi, sistem kumbahan yang berkesan, hinggalah kepada kolam yang menjadi ruang mereka bermandi dan berehat.

Tapir ialah haiwan herbivor yang gemar menikmati pelbagai tumbuhan dan buah-buahan segar. Antara menu harian mereka termasuklah daun senduduk, daun nangka, daun kepompong dan buah mangga, karot, ubi keledek serta jambu. Setiap hari, tapir diberi makan dua kali sehari, mengikut ketersediaan makanan dan jadual yang dijaga rapi oleh penjaga mereka.

Seperti haiwan lain, tapir juga menghasilkan najis dan urin dalam jumlah yang agak banyak setiap hari. Najis akan dibersihkan dahulu sebelum kandang atau *night stall* mereka dibasuh. Proses ini penting untuk memastikan tapir sentiasa selesa dan sihat. Menariknya, air basuhan daripada pembersihan kandang inilah yang menjadi sumber utama air sisa yang perlu dirawat. Lawatan ke Pusat Konservasi Tapir ini memberi peluang kepada kami untuk memahami bukan sahaja corak kehidupan haiwan unik ini, malah juga kepentingan menjaga alam sekitar melalui pengurusan sisa buangan yang lestari. Terima kasih buat PERHILITAN dan kerajaan kerana sentiasa prihatin menjaga dan melindungi tapir – si comel khazanah negara kita!

BENGKEL KALIBRASI HIDROMETER

Siti Fatimah Sadikon, Badrul Nizam Ismail, Faizah Kamarudin & Masyitah Md Nujid

Para peserta sedang melakukan kalibrasi alat hidromater di dalam Makmak Geoteknik 2

Bidang GEOTREN, Pusat Pengajian Kejuruteraan Awam, UiTM Cawangan Pulau Pinang telah mengadakan satu bengkel kalibrasi hIdrometer yang telah berlangsung pada 8 Ogos 2024 di Makmal Geoteknik 2, UiTM Cawangan Pulau Pinang. Objektif bengkel ini diadakan adalah untuk memberi lebih kefahaman kepada semua penyelia projek tahun akhir (FYP) tentang tatacara prosedur serta analisis dan pengklasifikasian tanah yang betul. Selepas bengkel ini diadakan, diharapkan agar semua penyelia FYP dapat memantau pelajar FYP masing-masing supaya melakukan ujian makmal dan analisis yang betul serta tiada kesilapan semasa menjalankan projek mereka.

Bengkel ini telah disertai oleh lima belas pensyarah bidang GEOTREN dan lima penolong jurutera. Bengkel telah dimulakan dengan taklimat oleh Puan Siti Fatimah Binti Sadikon tentang cara mengklasifikasikan tanah berdasarkan data yang diperolehi dari ujikaji taburan saiz zarah tanah (PSD) dan ketekalan tanah seperti ujian ayakan (ayakan basah dan ayakan kering), ujian hidrometer, ujian had cecair dan ujian had plastik.

Selain itu, peluang diambil untuk memperkenalkan penggunaan standard terkini dalam pengklasifikasian tanah selain daripada "BS5930:1999-Code of Practice for Site Investigation" dan "BS5930:2015-Code of Practice for Site Investigation" yang kerap digunapakai. Standard kod terkini tersebut ialah "BS EN ISO 14688:2018: Geotechnical investigation and testing – Identification and classification of soil" dan "BS EN ISO 17892:2016: Geotechnical investigation and testing - Laboratory testing of soil".

Seterusnya, taklimat lebih terperinci tentang pengklasifikasian tanah menggunakan ujian hidrometer telah disampaikan oleh Ir. Badrul Nizam Bin Ismail. Beliau telah memberi penerangan secara teori segala prosedur dan analisis untuk menghubungkan data dari ujian ayakan kering dengan ujian hidrometer bagi menghasilkan graf taburan saiz zarah tanah yang tepat. Kemudian bengkel disambung dengan demonstrasi ujian ayakan (basah dan kering) serta hidrometer oleh Tc Mohamad Azrul Azwad Bin Mohamad Nor dibantu oleh En Salahuddin bin Abdullah. Akhir sekali, semua peserta telah diberikan alat hidrometer dan dikehendaki untuk membuat kalibrasi ke atas alat tersebut untuk kegunaan pelajar FYP dan juga kelas.

Collaborative Monthly Technical Webinar between Civil Engineering Studies, UiTM Penang Branch and Faculty of Civil Engineering and Technology, Universiti Malaysia Perlis

Ts. Syahrul Fithry Senin

On December 31, 2024, the Faculty of Civil Engineering and Technology at Universiti Malaysia Perlis (UniMAP) hosted an informative two-hour (10 am until 12 noon) technical monthly webinar titled "Ground Penetrating Radar (GPR) Application for Reinforced Concrete Structures Construction Quality Control ". The session was presented by the invited speaker Ts. Syahrul Fithry Bin Senin from the Civil Engineering Studies, Universiti Teknologi MARA Penang Branch via online platform.

The webinar aimed to educate participants on non-destructive assessment techniques for reinforced concrete structures quality control using GPR technology. The participants were awarded 2 CPD training hours from Board of Engineers Malaysia, and e-certificate from the webinar organizer.

The webinar began with an introduction to internal concrete deterioration and defects, drawing an analogy between human health assessment and structural health monitoring. The speaker emphasized that just as medical professionals use various diagnostic tools to assess human health, civil engineers need reliable methods to evaluate the "health" of reinforced concrete structures. Common quality parameters requiring inspection in RC structures include:

- Concrete cover
- Rebar diameter
- Rebar spacing
- Quantity of rebars and their arrangement
- Embedded "anomalies" or materials within RC structures

The importance of these inspections was highlighted through several key reasons:

- Preventive maintenance of RC structures
- Avoiding excessive costly structural repair works
- Evaluating structural integrity and safety
- Creating accurate maps for clients to ensure avoidance during drilling operations

The speaker provided a comprehensive overview of Ground Penetrating Radar technology explaining that GPR is a geophysical method that uses radar pulses to image the subsurface. As a non-destructive testing method, GPR detects reflected signals from subsurface structures and can be used in various media to locate objects, anomalies, material changes, voids, and cracks.

Several case studies were presented to demonstrate GPR's practical applications:

1. **Detection of shallow delamination**: The presentation showed how GPR can identify delamination in continuous RC pavement structures through signal disturbances, though visual interpretation can sometimes be challenging.
2. **Corrosion detection**: A case study illustrated GPR's capability to detect potential corrosion in reinforcement, with verification through core sampling showing high chloride content in areas identified by GPR.
3. **Accuracy assessment**: The speaker referenced studies comparing GPR measurements with actual values, demonstrating good accuracy in determining concrete cover, rebar diameter, and spacing.

The webinar was successfully presented by Ts. Syahrul Fithry Senin to the Universiti Malaysia Perlis faculty members and students with a comprehensive understanding of GPR technology for assessing reinforced concrete construction quality. The presentation covered theoretical principles, practical applications, standards, and case studies, equipping attendees with valuable knowledge for non-destructive evaluation of concrete structures.

The speaker concluded by emphasizing that while GPR offers significant advantages in terms of speed, resolution, and ease of interpretation, it has limitations that users must understand. Proper training and adherence to established standards are essential for obtaining reliable results in concrete structure assessment.

This technical lecture contributes to the advancement of knowledge in non-destructive testing methods and supports the development of more effective structural health monitoring practices in the civil engineering field.