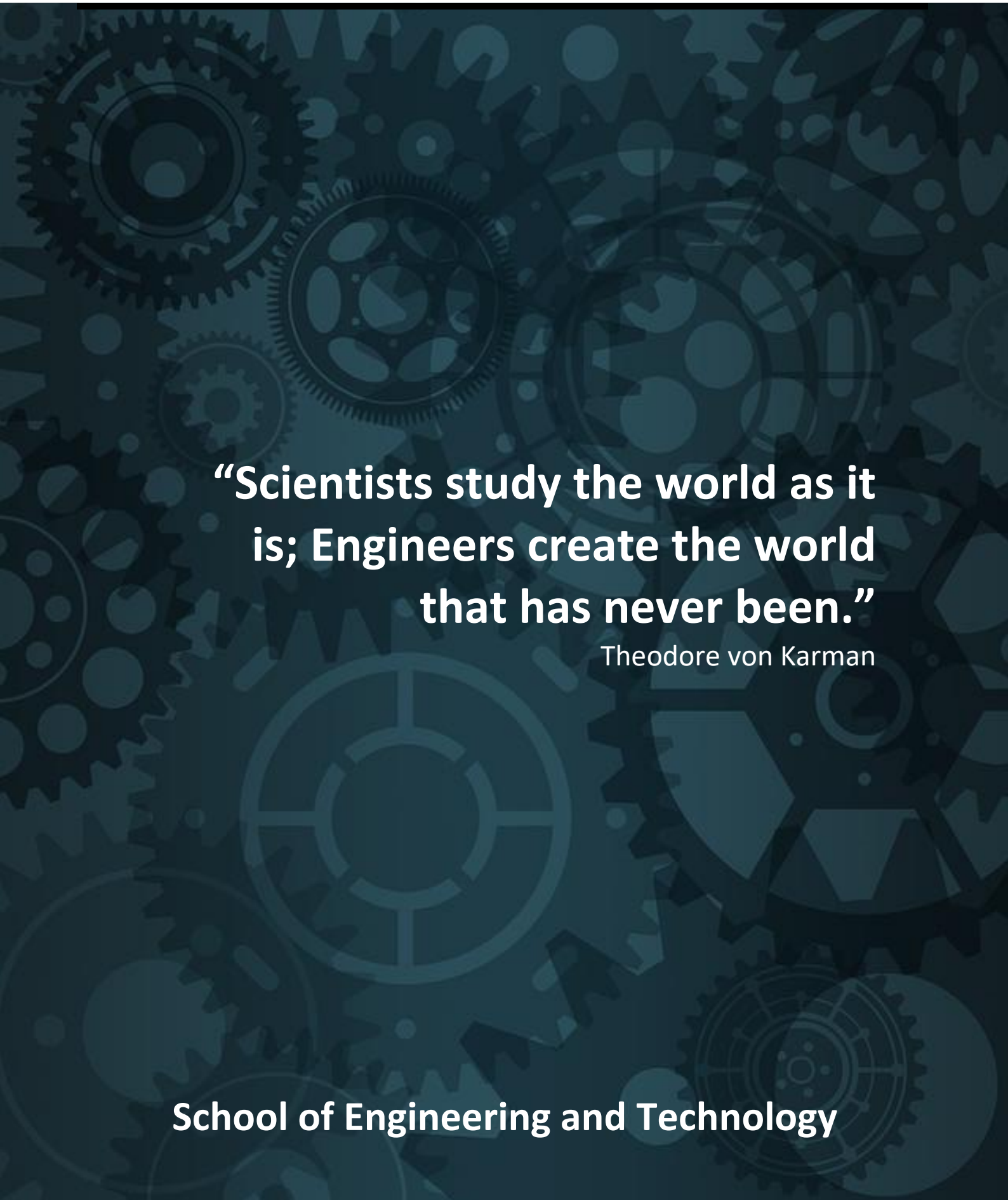
SET eDigest

SUNWAY UNIVERSITY
A CLASS ABOVE

Issue 08 | September 2021



"Scientists study the world as it is; Engineers create the world that has never been."

Theodore von Karman

School of Engineering and Technology

Preface

Looking back to the Q2 and Q3…

Dear Colleagues and Guests of the School of Engineering and Technology (SET). Welcome to the combined Q2 and Q3 issue of 2021 of our quarterly SET eDigest. It has finally arrived at your desk after a long delay. I would like to sincerely apologise for this postponement – it has been caused by my failure to write this very preface. And the reason for it was very prosaic: each and every one of us was extremely busy during the mid-2021 with our day-to-day work taking all our time and energy. Several times I started to write the message. And then always something more urgent required my immediate attention, so I needed to put my writing aside. As a result, I postponed and delayed it until this week closer to the end of the year when I promised myself to apologise to you all and to complete my writing task no matter what.

It has been a bit fascinating and somewhat emotional for me to go through this combined issue of the eDigest while recalling the plans and hopes, challenges and obstacles as well as events and achievements of those two quarters. Of course, it is easy to talk about our accomplishments, concerns, and actions from today's position of the unquestionable triumph of our School in 2021 (I will write about the overall results of SET in the forthcoming Q4 issue of the eDigest). However, by looking back to that rather difficult and very busy period, I am strongly convinced that it was the time of crucial importance for our overall success this year. Following the generally encouraging growth in the student enrolment combined with energetic and ambitious research activities in the first months of 2021, we have managed to keep up (and somewhat even to further extend) the pace of our activities while making our work also smarter, efficient, and quality-focused. And that was the winning approach. As a result, we have largely reached our targets for new student enrolments and achieved exceptionally healthy overall student population growth. Despite the serious and prolonged restrictions caused by the ongoing COVID-19 pandemic, the School research activities were not stopped or slowed down any much. They were just adjusted to address the changes in the ongoing operating conditions. Their core was realigned towards maximising the lab experimental research if and when it was possible during short windows of opportunity and when established standard operating procedures (widely known as SOPs) allowed to do it. At the same time, very significant efforts were concentrated in the theoretical, online, and office-type study activities, focused on writing project proposals, working with manuscripts for publication, developing state-of-the-art reviews, guiding postgraduate students, and many more. In fact, the great success of 2021 in the areas of research output such as publications, postgraduate admissions, conference applications, and especially external research grant awards should be attributed to the submissions made in that part of the year.

Finally, besides all the difficulties and restrictions, our day-to-day academic community lives and interactions with colleagues and students continued and progressed very well. We organised and participated in a multitude of business and social events and online gatherings with students, staff, as well as numerous academic and business partners from outside the School. We always have our admin colleagues available on standby to help us and students either online or face-to-face at the campus if needed.

Most important was that we were careful and responsible in following the regulations and acting in the right way thus reducing any chances to spread the virus or to get it on our own. I am happy to say that we greatly succeeded in that – no COVID cases were originated recorded at the School on the campus. Just a very few colleagues were unlucky to be infected from their outside contacts. However, in all the incidents those were mild cases that were treated properly enabling the colleagues to return back to normal life and work soon. Congratulations to you all, dear colleagues, for that very important achievement during those worrying times!

All in all, I am proud of what was done and achieved in Q2 and Q3 of 2021 and very thankful to everyone for your kind and valuable contributions.

With very best regards to you all

Professor Serge Demidenko

Dean

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Launch of Engineering Programmes

Established in 2011, Sunway University has grown from strength to strength in education, research, talent development, and contribution to society both on the national stage and globally. Tan Sri Dato' Seri Dr Jeffrey Cheah, Founder and Chancellor of Sunway University, has envisioned it to be a modern academic institution of high reputation and professional standing covering a comprehensive set of disciplines of key importance to the modern world. Entering into the new decade of its history of continuous success and high growth, the University is now ready to extend its programme offerings to a new area of strategic importance - Engineering thus furthering the pursuit towards the grand vision set by its founder.

Two inaugural Bachelor of Engineering with Honours programmes in Electronic and Electrical Engineering, and in Chemical Engineering will become available to our students in the near future. The forthcoming introduction of them is the result of the extensive work carried out during the last two years by the team of colleagues at the School of Engineering and Technology (SET), under the leadership of Professor Serge Demidenko, Dean, supported by the specialists of the relevant offices of the University. It included extensive market research on the national, regional, and international demand for qualified professional engineers in various sectors of economy, planning of the structure of the programmes in consultation with reputable international partners; preparation of the educational materials, identification of the relevant academic staff with the required professional qualifications, development of laboratories and equipment ordering, preparation of the submissions and obtaining the required approvals from the governmental agency and professional accreditation body, and many more. The success of those activities has resulted in the firm arrangements to admit the first cohort of students in the Electronic and Electrical Engineering programme in August 2021, and in the Chemical Engineering programme in March 2022. The School plans to introduce one-two new Engineering and Technology programmes every year from now on.

Since the recent time, the world has been negatively impacted by the COVID-19 pandemic on an enormous scale. Science, Technology, and Engineering including Electronics, Communications, and Computing have been pivotal to introduce innovative and efficient solutions and tools to mitigate the damage caused by the calamity of the pandemic. They have contributed immensely to the protection of society, provided healthcare with advanced life-saving equipment and tools as well as diagnostics and data processing facilities, greatly supported the economy at large, enabled education to continue to be offered, and many more. It is also during such a trying time, new technological challenges, tremendous changes, and significant advances have happened in the technology and engineering themselves. They lead to strong demand for top-notch engineering specialists in many existing hi-tech areas as well as fast-growing new ones, such as Artificial Intelligence, Internet of Things, Advanced Materials to mention a few. And that is what the new programmes aim to address while employing the latest innovative teaching methodologies and approaches that will expose students to the latest theories, engineering practices, equipment, and tools. Through close links with industry and by focussing on the real-world problems, our engineering programmes will equip students with strong technical know-how and hands-on practical exposure enabling them to make valuable contributions immediately upon their graduation. To support it, Sunway University has invested in new laboratories and high-quality equipment. This ensures that the students will receive the best knowledge, exposure to new technologies, and skills training. At the same time, the School of Engineering and Technology has assembled a team of highly capable academics having advanced professional qualifications, diverse international exposure, strong research portfolios, and extended successful education records to enhance the learning experience of our students.

Both the new Bachelor of Engineering (with Honours) programmes have received provisional accreditation from the Engineering Accreditation Council (EAC) Malaysia and the Malaysian Qualifications Agency (MQA) as well as the approval from the Ministry of Higher Education, Malaysia. Upon the graduation of the inaugural cohorts of students, the programmes will progress towards full professional accreditation. Graduates from both of them will have the opportunity to register as Graduate Engineers with the Board of Engineers Malaysia (BEM) while also preparing themselves to be registered as Professional Engineers when they have gained professional experience and met the requirements set by BEM. This Professional Engineer qualification is internationally recognized

through the Washington Accord of the International Engineering Alliance – the global organisation that establishes and enforces internationally bench-marked standards for engineering education and expected competence for engineering practice.

The first of the engineering programmes, Bachelor of Engineering (Electronic & Electrical Engineering) with Honours, will specialise in the design, implementation and application of electrical and electronic equipment, embedded and computer systems, interfaces, and communications. Electrical engineering tends to focus on larger scale electrical equipment and machines as well electrical power. In contrast, electronic engineering is more focused on electronic and photonic circuits and devices, embedded signal and data processing solutions, computer-based control and sensor systems, modern digital and mobile communication equipment implementations. The programme will equip students not just with a strong technical foundation, advanced engineering knowledge in a variety of important hi-tech areas, and the ability to implement and apply them in practice, but also with extended soft skills and management capabilities. They are highly relevant and are of great importance for engineering professionals in the industry, research, academia, defence, service sector, government, etc., as we move into the era of Industrial Revolution 4.0 and beyond.

The new degree programme in Electronic and Electrical Engineering offers a wide variety of career options. Graduates will be able to venture into various industries such as electronics, telecommunications, robotics and industrial automation, computer engineering, power systems, medical electronic equipment, and more as well as to many other sectors of the economy, research, academia, services, defence and government as it would be right to say that the digitized modern world has been founded on the advances of the electronic and electrical engineering.

The programme is open to Malaysian and International students. Scholarship opportunities are also provided, including the inaugural bursary for the first student cohorts.

> "Science can amuse and fascinate us all, but it is engineering that changes the world."
>
> Isaac Asimov

SET Town Hall Meeting (April 2021 Semester)

The SET Town Hall Meeting was held online on 27 April 2021. The Dean shared with the School of Engineering and Technology team on the new Head appointments for the Department of Computing and Information Systems (DCIS) and the Department of Engineering (DEN), a new addition to the SET team, student statistics, new programmes, and other important updates. The session continued with the sharing by the Associate Dean (Education) and the new Head of DCIS, Professor Yau Kok Lim. Professor Yau shared on the Teaching and Learning and highlighted the key initiatives for workload, best practice sharing, and employability enhancement. The Associate Dean (Research and Postgraduate Studies), Professor Mohamed Kheireddine then shared on research statistics, research achievements, research events, research grant opportunities, and other updates. Last but not least, the Associate Dean (Engagement and Internationalisation), Professor Lau Sian Lun highlighted the key to successful growth and shared the current Sunway University strategies and projects, ideas for 2021 and beyond, and future goals.

SET Town Hall Meeting April 2021 Semester.

SET Conference Seminar Series #2/2021

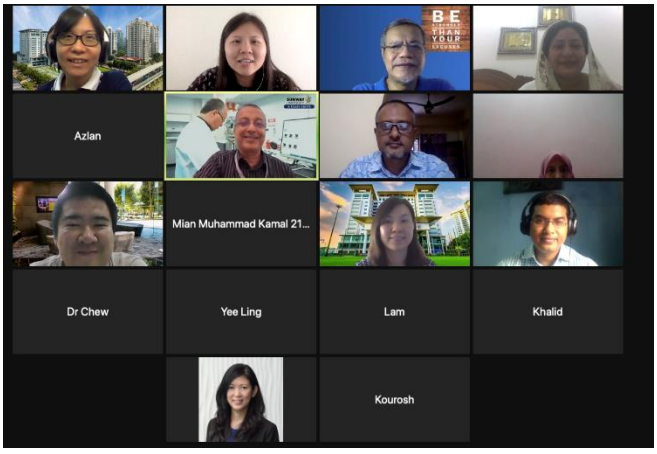
The SET Conference Seminar Series #2/2021 was held on 11 May 2021 via Zoom. It is organised as part of the post-conference requirement that staff who had attended conference will need to present their paper or an overview of the conference at a seminar or similar event at Sunway University, attended by other members of academic staff and students.

The seminar started off with the Introduction by Associate Dean (Research and Postgraduate Studies) Professor Mohamed Kheireddine Aroua and followed by Welcome Remarks and presentation by Dean of School of Engineering and Technology, Professor Serge Demidenko. Assoc. Prof. Dr Angela Lee Siew Hoong and Assoc. Prof. Dr Teh Phoey Lee Heard from the Department of Computing and Information Systems have also presented their conference papers. They have presented their conference papers to a total of 12 participants.

SET Conference Seminar Series #3/2021

The SET Conference Seminar Series #3/2021 was held on Tuesday, 28 September 2021 via Zoom. The seminar is attended by both academic staffs and students.

The seminar started with Professor Mohamed Kheireddine Aroua welcoming the audience. He then proceeded with his presentation on the membrane process in providing clean water supply for the people in the remote areas in Malaysia. This is followed by Dr Low Yeh Ching's presentation on the usage of OneNote as a collaborative learning tool to enhance the students' learning experience. Last but not least, Professor Mayeen Uddin Khandaker presented on developing a mobile application to identify different types of flowers with the hope that it will be helpful in the medical field in the future. They have presented their conference papers to a total of 21 participants.



Seminar on "Emerging Technologies for CO2 Capture and Utilization"

Climate change is a real threat to life on earth to which carbon dioxide is recognized as the major contributor. This makes reduction in CO_2 emissions a worldwide emergency and priority. Currently tremendous research worldwide is being carried out to tackle the challenge of integrating CO_2 capture with its utilization. As a result, new scientific discoveries and innovative technologies are emerging to mitigate carbon dioxide emissions. Recognising the importance of them, the Centre for Carbon Dioxide Capture and Utilization (CCDCU) of Sunway University (member of the EuroAsia Carbon Dioxide Capture and Utilization Network) organized a 2-day seminar on "Emerging Technologies for CO_2 Capture and Utilization"on 7-8 July 2021. This seminar was organized within the framework of the Sunway University International Research Network Grant Scheme and consisted of 4 sessions. The seminar was endorsed by the Board of Engineers Malaysia (BEM) as equivalent to 9 CPD credit hours.

International speakers from MIT (USA), Lancaster University (UK), Aristotle University of Thessaloniki (Greece), National University of Singapore (Singapore), Inha University (Korea), United Arab Emirates University (UAE), Dawood University of Engineering and Technology (Pakistan), University of Indonesia (Indonesia) along with local speakers from UniMAP and Sunway University presented and discussed the most recent innovations, trends, and techno-economic aspects related Carbon Dioxide Capture and Utilization. Over 300 participants from 34 countries registered for the seminar with actual participations exceeding 80 participants per session. The seminar was graced by Sunway Group Founder and Chairman Tan Sri Dr. Jeffery Cheah AO through a special -welcome address. In this address, Tan Sri Jeffrey Cheah AO highlighted that Sunway Group is committed to support the United Nations (UN) Sustainable Development Goals (SDGs) through a wide range of initiatives. Sunway University president Professor Sibrandes Poppema opened the event and Professor Serge Demidenko, Dean of the School of Engineering and Technology warmly welcomed the attendees.

In her talk, Assoc. Prof. Betar M. Galant (MIT), presented the latest developments in CO_2 capture with direct electrochemical conversion as the technology of the future for net-zero emissions. Amine based electrolytes will continue to be the choice for such processes. However, their properties should be tuned to facilitate the electrochemical reduction of CO_2.
Assoc. Prof. Demitrios Tsiplakides from Aristotle University of Thessaloniki focused his talk on the electrochemical routes for CO_2 Utilization. He highlighted the processes converting CO_2 into chemicals/fuels such as to formates, CO and methanol emphasizing on the importance of optimization of the catalysts and scale-up of the reaction reactor for further research direction. Catalysts were also the focus of the talk by Dr. Munawar Khalil from Indonesia who discussed crystal facet engineering as a new strategy for enhancing photoactivity of semiconductors in solar fuel production from CO_2. Prof. Sibudjing Kawi from NUS, suggested developing sustainable catalysts in combination with membrane processes as the new research directions towards more efficient CO_2 capture and utilization with Prof. Sang-Eon Park from Inha University demonstrating the versatility of CO_2 as a building block for a wide range of chemical and electrochemical transformations. Enzyme catalysis and bioprocesses for CO_2 conversion were also described by Prof. Sulaiman Al-Zuhair from United Arab Emirates University. Emerging nanomaterials will be playing a key role for CO_2 capture as suggested by Prof. Saidur Rahman (Sunway University) and according to Dr. Arifutzzaman Rahat (Sunway University) will be the basis of more efficient electrodes in the future

electrochemical technologies for CO_2 conversions. Materials derived from biomass have a great potential as sustainable adsorbents for CO_2 capture as explained by Assoc. Prof. Ir. Umi Fazara Md Ali from UniMAP. They are characterized by high surface area and ability to be functionalized with groups having high affinities for CO_2. Enhanced rock weathering was presented by Dr. Binoy Sarkar from Lancaster University as an innovative approach to capture atmospheric CO_2 and use it in agriculture. Another interesting development highlighted in this seminar is the emerging of AI technologies in the field of CO_2 capture and utilization. This was highlighted by Dr. Shaukat Mazari Dawood University of Engineering and Technology who described how Artificial Intelligence and Machine Learning could help in developing sustainable CO_2 capture processes. Integrating CO_2 capture and utilization is the way forward to tackle one of the grand challenges facing earth and humanity. As mentioned by Professor Mohamed Kheireddine, Head of CCDCU "CO_2 capture and its utilization is crucial for protecting life on earth, it is also essential for creating life on other planets as demonstrated recently during NASA's Mars mission where CO_2 from Mars atmosphere was captured and utilized to generate Oxygen an essential gas for life".

Sunway University and School of Engineering & Technology (SET) Management as well as CCDCU team would like to express our gratitude to our distinguished speakers for their valuable contribution and for kindly sharing their vast experience and expertise during this seminar and making it a memorable and successful event. With this successful event, CCDCU will continue to plan and organize more exciting seminars in the future. For more information or to receive updates on the upcoming events and other activities of Sunway University Centre for Carbon Dioxide Capture and Utilization (CCDCU) , please contact Mrs. Norul Hazizah Hussain at hazizahh@sunway.edu.my or the Head of the Centre, Prof. Mohamed Kheireddine Aroua at kheireddinea@sunway.edu.my

Unlocking the Power of Collaboration through Best Practices Sharing for Supporting Innovation and Excellence in Teaching and Learning

The School of Engineering and Technology has announced a series of Best Practices Sharing Sessions throughout the year 2021 with its first session held online at 1:00pm - 2:00pm on 24 March 2021. The session brought together SET colleagues who are teaching undergraduate and postgraduate programmes. During the session, Professor Yau Kok Lim, Associate Dean (Education) highlighted that the best practice sharing session will spark a collaborative effort among colleagues to adopt innovative ways of teaching that will improve student learning experience, and to tackle challenges and issues in teaching and learning and best practices will retain and circulate among us, thereby improving the School as a whole as time goes by. Most importantly, the series of best practices sharing sessions will increase solidarity among SET colleagues to pursue the vision and mission of our School and University. Assoc. Prof. Dr Angela Lee Siew Hong was invited to share the first best practice. Her topic was "Best Practices in Promoting a Programme". She shared her unique ways of promoting a programme, from creating promotional video to showcasing unique experiences among students and academic staff. Her ultimate goal is to meet the growing needs of the offered programme in our society and the global community. The interactive session also encourages colleagues to share some of their best practices in brief. The event ends with a driving phrase "Sharing is Caring for a Better SET" that captures the

essence of our series of sessions.

Best Practices Sharing Session by Professor Yau Kok Lim and Assoc. Prof. Dr Angela Lee Siew Hong.

Development of a Novel Design and Subsequent Fabrication of an Automated Touchless Hand Sanitizer Dispenser to Reduce the Spread of Contagious Diseases by Professor Mayeen Khandaker and Team

The key problem of the conventional ultrasonic and infrared-based dispensers is their malfunctioning due to the interference of sunlight, vehicle sound, etc. To overcome such limitations, this study introduced a laser-based sensing device to dispense sanitizer in an automated touchless process.

This work demonstrates a novel design and subsequent fabrication of a low-cost, touchless, LDR-based automated sanitizer dispenser to be used in public places. The overall performance of the manufactured device was analyzed based on the cost and power consumption, and environmental factors by deploying it in busy public places as well as in indoor environment, and found to be more efficient and cost-effective compared to conventional dispensers available in the market. The presented device is expected to play a key role in contactless hand disinfection in public places, and reduce the spread of infectious diseases in society.

Detailed information is available at https://www.mdpi.com/2227-9032/9/4/445

Professor Mayeen Khandaker recent publication on Development of a Novel Design and Subsequent Fabrication of an Automated Touchless Hand Sanitizer Dispenser to Reduce the Spread of Contagious Diseases.

Nuclear Physics and Perseverance: Detective Tales from Mars

The Perseverance Rover touched down on the surface of Mars on 18th February of this year and is presently going about its business exploring the crater Jezero. A key instrument on the Perseverance Rover is PIXL (Planetary Instrument for X-ray Lithochemistry), a

microfocus X-ray fluorescence instrument that can analyze the elemental chemistry. Customised polycapillary X-ray focusing optics applied to an X-ray beam (from a rhodium anode, grounded-cathode design X-ray tube) provides for micro-X-ray fluorescence analysis of rocks or soil at a spatial resolution of some 120 mm (suggestive of the use of photonic fibres). The induced X-ray fluorescence information is returned to earth via telemetry. The effort is supported by SHERLOC, an instrument on the end of the rover's robotic arm that can hunt for sand-grain-sized clues in the rocks, working in tandem with WATSON, a camera that is intended to take close-up pictures of rock textures. The high X-ray flux of PIXL gives rise to high sensitivity and hence fast acquisition times, allowing rapid scanning of most of the detectable elements, 26+ in all, now detectable at lower concentrations than possible on previous landed payloads; several new elements can be detected that were not previously detectable on these missions. In particular, PIXL can measure a large number of major and minor elements at 0.5 wt% in 5 seconds, detecting important trace elements at the 10's of ppm level.

The Perseverance Rover has its antecedents, most recently the Curiosity Rover (functioning for more than 3000 days). Just as is now true of the Perseverance Rover, the Curiosity Rover (which landed on Aeolis Palus inside the Gale crater), was equipped with a radioisotope power system, electricity being generated by the heat given off via the radioactive decay, in these particular cases by plutonium (presumed to be 238Pu, t1/2 87.7 years), such a system generally being referred to as a radioisotope thermoelectric generator (RTG) although for these space missions the power source is referred to as a Multi-Mission Radioisotope Thermoelectric Generator (MMRTG). Power production is suggested to be at the level of some few hundred watt. Although one is not privy to the particular inner workings, in principle the nuclear battery makes use of thermocouples, converting the decay heat into electricity via the Seebeck effect. Importantly, this type of generator has no moving parts. For the Curiosity mission, instead of use of an x-ray tube for fluorescence analysis, use was made of an Alpha Particle X-ray Spectrometer (APXS), an updated version of the spectrometers used on the Mars Exploration Rover (MER) and Mars Pathfinder missions. In these, the samples are bombarded with X-rays and alpha particles from a curium source, commonly 244Cu, emitting alpha particles with an energy of 5.8 MeV, while x-rays of energy 14 and 18 keV are emitted via the decay of 240PPu. The APXS power has been provided by a thermoelectric generator, of a form previously discussed.

Professor David Andrew Bradley

It may not be too well known but with colleagues, the majority of whom were based in Malaysia, this author played what came to be a pivotal role in developing the science that has since been applied in the elemental analysis techniques discussed above, although perhaps now superseded [1]. At Sunway University we too continue to play important roles in impactful research and education in applied and radiation physics. In that very same spirit of perseverance that has this month lead to the very first flight taking place on another planet, we continue to involve ourselves in exploration of the sub-atomic world, joining the efforts of the many others who have contributed to society in such ways, not always within the limelight. For its part, CAPRT, the Centre for Applied Physics and Radiation Technologies at the School of Engineering and Technology, in unison with the Physics Department of the University of Melbourne, co-hosted the 3rd International Forum on Advances in Radiation Physics (IFARP-3, 24-25 February 2020), a virtual platform meeting with contributions from some 20 countries. Later this year we will also hold the 15th meeting of the prestigious International Symposium on Radiation Physics (ISRP-15, 6-10 December; do visit the website isrp15.com to see the very many world leading nuclear and radiation scientists who will be presenting at the meeting). Standing back from the many radiation physics aspects surrounding the functioning of the Perseverance Rover, in the many months since the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) came to so overwhelmingly control our lives, such activities all point to the power of perseverance and of curiosity, even when confronted by difficulties and complexity. We press on regardless.

[1]. The use of coherent gamma-ray scattering for the characterisation of materials. J.R.Mossop, S.A.Kerr, D.A.Bradley, C.S.Chong and A.M.Ghose, Volume 255, Issues 1–2, 15 March 1987, Pages 419-422. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment

Source:
https://university.sunway.edu.my/explore/thinkpieces/Nuclear-Physics-and-Perseverance-Detective-Tales-from-Mars

Skills for Modern Workplaces

Alongside with the Exploration Month Webinar Series, Professor Lau Sian Lun, Associate Dean, School of Engineering and Technology, Sunway University and Ms Tang Ing Sia, Senior Operations Manager, Sunway College Kuching were invited to speak on the topic "Skills for Modern Workplaces". The webinar was aired on Sin Chew Sarawak's Facebook page on 27 March 2021.

Professor Lau Sian Lun and Ms Tang Ing Sia were invited speakers for Exploration Month Webinar Series.

"AI can be our friend."

Bill Gates

Malaysia's Global Top 1% Researchers by Clarivate Web of Science

Clarivate and Ministry of Higher Education Malaysia recognized 2019 & 2020 Malaysia Highly Cited Researchers in a virtual award ceremony on 29 April 2021. Award recipients shared their work and inspire fellow researchers by creating awareness among the industries in expanding University-Industry collaborations.

Professor Mohamed Kheireddine Aroua (Associate Dean – Research & Postgraduate Studies and Head, Research Centre for Carbon Dioxide Capture and Utilisation) and Professor Saidur Rahman (Head, Research Centre for Nano-Materials and Energy Technology) are among the world Highly Cited Researchers. According to Clarivate, "Highly Cited Researchers is an annual list recognizing influential researchers in the sciences and social sciences from around the world. Recognizing the true pioneers in their fields over the last decade, demonstrated by the production of multiple highly-cited papers that rank in the top 1% by citations for field and year in the Web of Science".

Professor Saidur (left) and Professor Mohamed Kheireddine Aroua (right) are recognized as Highly Cited Researchers by Clarivate.

Assoc. Prof. Ts Dr Angela Lee Won Distinguished SAS Educator Award

The Distinguished SAS Educator Award recognizes an educator who has made significant contributions to advancing analytics education and preparing students for careers in analytics and data science. This prestigious award is given to an educator whose efforts and impact in the field and engagement with SAS have spanned more than five years. The Award recipients were selected based on their contributions in expanding analytics education and research at their institution and community. To name a few of the participants for Asia Pacific category are Universities from China, Taiwan, Australia, Hong Kong, Japan, India, Korea, Singapore, Thailand.

Analytics is not only one of the hottest fields for new graduates, it is also used by educational institutions to improve administration, teaching, research and learning. In acknowledgement of the importance of analytics in education, SAS has recognized Sunway University, Malaysia and presented Assoc. Prof. Ts Dr Angela Lee Siew Hoong of Sunway University with the Distinguished SAS Educator Award. The 2021 Distinguished SAS Educator Award was announced at SAS® Global Forum. Assoc. Prof. Ts Dr Angela Lee received this award for her work supporting students and incorporating analytics in the classroom and beyond. Dr Angela has been integrating analytics into syllabus and prepares her students to enter the workforce by staying up to date with industry needs and she considers herself an "advocate" for data science. Dr Angela was the key person to introduce data analytics degree at Sunway University, she has developed many innovative ways to use SAS from the most elementary to advanced analytics. She teaches Social Media Analytics, Visual Analytics, Advanced Analytics and Business Intelligences and regularly speaks at data and analytics conferences.

Assoc. Prof. Ts Dr Angela Lee Siew Hoong Won Distinguished SAS Educator Award.

Assoc. Prof. Ts Dr Angela Lee and her Co-researchers Won Best Paper Award in ACIDS2021

Assoc. Prof. Ts Dr Angela Lee and her co-researchers won Best Paper award in the Asian Conference on Intelligent Computing and Data Sciences 2021 (ACIDS2021) for the outstanding paper entitled "Visualizing Keyword Relationship Analysis Over Online Traveller Review" under the conference session "Big Data Analysis". This conference was organized virtually by Universiti Malaysia Perlis (UniMAP) and Universiti Utara Malaysia (UUM) during 24 - 25 May 2021. The aim of the paper is to extract the keyword (factors) that influence travellers in their choices of hotels using the framework of Visualizing Keyword Relationship Analysis (VKRA). The relationships of these keywords are presented using text analytics visualization techniques such as term frequency, keyword association and keyword network graph. The incorporation of these text

analytics techniques offers insights for (i) travellers to view the opinions of other travellers on these hotels and (ii) hotelier to understand travellers' preferences (location, room, services) and experiences, and improve their services in the future. This paper will be published by the IOP Science Journal of Physics: Conference Series, indexed in SCOPUS and ISI Web of Science.

Syam Gopala Krishnan Won Best Poster Presentation Award at WNCST 2021

Dr Syam Gopala Krishnan from Graphene and Advanced 2D Materials Research Group, School of Engineering and Technology has recently won the best poster presentation award in World Nano Congress on Advanced Science and Technology (WNCST 2021) conducted by the Vellore Institute of Technology, India. The best poster award was sponsored by ACS Omega.

The topic of the poster was "Microwave Assisted Synthesis of MnCo2O4 nanoflakes as a high-performance Supercapacitor Electrode".

The team members were Dr Syam G. Krishnan, Dr Priyanka Jagadish and Professor Mohammad Khalid.

Dr Syam Won Best Poster Presentation Award in World Nano Congress on Advanced Science and Technology (WNCST 2021).

Professor Lau Sian Lun has been awarded the Lancaster University Education Conference 2021 Prize

The Lancaster University Education Conference 2021 has taken place virtually on the 7 and 8 July 2021. Three colleagues from Sunway University have been accepted to present their work at the conference to an international crowd. Among them, Prof. Dr Lau Sian Lun from SET has been awarded the Education Conference Award, among other five awardees from Lancaster University, Blackpool & the Fylde College and University Academy 92. His oral presentation on the 8 July 2021, titled 'The good, the bad and the "surprises"' shared the results from an analysis study on students' feedback and perception on teaching and learning experience throughout the pandemic impacted semesters in 2020. Co-authors of the work done were Professor Alvin Ng Lai Oon (School of Medical Life Sciences), Assoc. Prof. Dr Sim Tze Ying (Center for American Education) and

Professor Abhi Veerakumarasivam (from School of Medical Life Sciences).

Feedback from the conference team member commended *'Sian Lun went beyond 'observation' to undertaking and presenting on rigorous qualitative research and demonstrating how the results of this research might feed into teaching practice going forward*'. The conference committee team recognised the presentation as outstanding for the presented contents engaged well with the key conference themes of thinking backward; looking forward. Apart from that, the study also demonstrated how learning is applied to practice and is able to articulate innovation and change. The discussions after the presentation with the track audience were engaging and interesting to allow the authors to plan on follow up work.

Prof. Lau was pleasantly surprised by the recognition, "I didn't expect to receive the award as my intention to join the Lancaster University Education Conference 2021 was to share our findings from the study carried out by my colleagues and me in 2020 in an international platform. I was looking forward to feedback from my colleagues at Lancaster University and other international participants, and I have received positive and useful feedback. The award and recognition were indeed unexpected, and I am humbled by the positive words from the conference committee. On the other hand, I hope this award may also inspire my colleagues at Sunway University to continue to show case the good work we do in Malaysia to an international crowd when the opportunity arises. The experience will be rewarding."


Looking Back and Beyond
Learning through challenging and changing times
2021 Lancaster Education Conference
Lancaster University

Lancaster University Education Conference 2021 Award

Awarded to

Sian Lun Lau (Sunway University)

This award recognises your outstanding presentation and contribution to the conference

Dr Kathryn James
Chair

Dr Sarah Ann Robin
Member and Lead for Prizes

for the Lancaster Education Conference Steering Group

The abstract of the paper is as following: "*The academic departments at the School of Science and Technology carried out two surveys to understand students' sentiment and feedback on the different initiatives introduced due to the lockdowns imposed during the pandemic in 2020. This presentation discusses the students' feedback on the online teaching and learning implemented at Sunway University. Among the key themes discussed are the students' perspectives on what they liked and disliked most throughout this unprecedented experience as well as what they hoped that the university will continue to practice post-lockdown.*"

Prof. Lau welcomes any inquiry on the study carried out and its results. He and his co-authors also welcome ideas and collaborators for further studies focusing on understanding factors and issues that may affect students' teaching and learning experience throughout the pandemic period. He can be contacted via email (sianlunl@sunway.edu.my).

Sunway University Won Cisco APJC DevNet Innovators Challenge

The Cisco APJC DevNet Innovators event is a 2-stage challenge that is open to Cisco's customers, partners, and students. In this challenge, the participants would need to ideate and develop new use cases where the power of Cisco programmability can help them to reach the desired business outcome, then, bring the idea to life by developing a prototype with utilizing the resources from Cisco.

Research Centre for Human-Machine Collaboration (HUMAC) is honored to be invited by Cisco Malaysia to represent ASEAN in this event. The Head of HUMAC, Assoc. Prof. Dr. Yap Kian Meng led two teams,

Sunway Team A known as SunwayA
i) Abdurraheem Joomye from BSc (Hons) Information Technology (Computer Networking and Security) as Team Leader
ii) Ong Yee Fan from BSc (Hons) Information Technology (Computer Networking and Security)
iii) Tay Yu Xuan from BSc (Hons) Information Technology (Computer Networking and Security)

and

Sunway Team B known as SIoT
i) Chew Zhe Zhi from BSc (Hons) Information Technology (Computer Networking and Security) as Team Leader
ii) Kelvin Choo Zhen Hou from BSc (Hons) Information Technology (Computer Networking and Security)

iii) Lim Eu Jie from BSc (Hons) in Computer Science

as representatives of Sunway University to participate in the event.

It is also worth mentioning that Sunway Team B, with their creation entitled "Disaster warning system with climate monitoring", has successfully secured a categorical award – "Fresh Energy", from 26 competitors which consist of technology giants, government departments, and famous universities around the world (i.e. China Unicom, Wipro, Tata Consultancy Service, Fujitsu, Nagoya University, Busan City Hall and etc).

"Disaster warning system with climate monitoring" is a prototype that aims to create an early disaster warning system that includes climate monitoring. It uses IoT components such as microcontrollers, sensors and LED displays. All the sensors and physical feedback components that are mentioned above are connected to microcontrollers. The fire and smoke sensor are used to detect fire/smoke hazards, while the temperature and humidity sensor is used to monitor climate. The system is fully scalable and can be connected over 5G network.

The main objective of this project is to create a wireless disaster warning system. When there is a disaster such as the smoke present, the module will power on the LED, buzzer, and display warning messages. The module will also send warning messages using a bot in Cisco Webex Teams. At the same time, the readings of the sensors can be monitored in real-time via an online dashboard. Real-time climate monitoring also benefits the client in a few scenarios such as:
a) Office buildings Air conditioners can be adjusted according to human presence and room climate to reduce electricity consumption.
b) Telco towers Base station temperature can be monitored to ensure that it is running at optimum temperature. When the temperature is abnormal, the service team can be deployed immediately to perform diagnosis and repair works.

Sunway Team B as GR3-SIoT won the categorical award – "Fresh Energy".

27 participants from all around the world in the event.

Sunway University Awarded a Research Fund for a Joint-Research with Cambridge University and Sunway Medical Centre

Sunway University (SunU) has been awarded a Sunway Cambridge Collaborative Research Fund of RM446,500.00, for a joint-research with Cambridge University (Cambridge U) and Sunway Medical Centre (SMC). Leveraging on the expertise of the Centre for Applied Physics and Radiation Technologies (CAPRT) from School of Engineering and Technology (SET), on novel low dose dosimetry, Sunway University made an attractive proposal that interested Cambridge University to collaborate on prospective positive effects of low dose radiation. The research embarks on low dose radiation hormesis of normal and cancer tissues, and we predict that there will be great potential for therapeutic applications.

These experiments use a state-of-the-art 3D primary system of trypsin-free, long-term cell culture developed by the Gurdon Institute, University of Cambridge. These 3-D cultures are meant to resemble the architecture,

markers and characteristics of cancer (Nasopharyngeal Carcinoma) and normal skin explants. Studies include proliferation, differentiation, and cellular variability when exposed to different low doses of radiation. The research includes unravelling and understanding the alterations in molecular, genetic and proteomic profiles that are little known till to date.

The Sunway University team are Professor Peh Suat Cheng (Principal Investigator) from School of Medical and Life Sciences (SMLS) and Prof David Bradley (Head of CAPRT, SET), Dr Ronald Teow Sin Yeang (Department of Medical Sciences, SMLS) and Dr Chew Ming Tsuey (CAPRT, SET); Cambridge U team members comprises of Dr David Fernandez-Antoran, Gurdon Institute, CRUK-RadNET and Dr Alex Samoshkin from Translational Technology; SMC team members are Dr Koay Cheng Eng (ENT specialist), Dr Margaret Leow (Plastic and Reconstructive surgeon), Dr Heng Siew Ping and Ms Yong Jie See (Medical Physicist).

Data Analytics Students Won 2nd Runner Up in ASEAN DSE 2021

Photo 1: Group photo on Day 2 of the Regional Finals 2021, 6 October 2021

SAP SE (NYSE: SAP) and the ASEAN Foundation are pleased to announce that three teams from Saint Joseph Convent School, Kirirom Institute of Technology, and **Sunway University** have emerged as the winners in the ASEAN Data Science Explorers (ASEAN DSE) Regional Finals 2021 which took place from 5-7 October 2021 virtually.

The three teams came out on top for their insights and data-driven solutions that support the United Nations Sustainable Development Goals (UN SDGs), highlighting the importance of climate action and sustainability. Below are the details of the winners:

- Team Youth Forward, comprising Rada Prapaikornkiet and Kanjaree Suppawittaya from Saint Joseph Convent School, Thailand, emerged as the first winner. Their presentation was focused on empowering farming towards a sustainable future of the ASEAN Community covering SDG 2 – Zero Hunger, SDG 4 – Quality Education, and SDG 8 – Decent Work and Economic Growth

- Team Sprinkle, comprising Chakriya Suy and Serei Neath Reasey, from Kirirom Institute of Technology, Cambodia, took the first runner-up position. Their presentation was focused on recycle centers as the solution for waste management covering SDG 8 – Decent Work and Economic Growth and SDG 11 – Sustainable Cities and Communities

- **Team Brain Drain, comprising Ryan Kok Lam Liew and Jia Hui Ng, from Sunway University, Malaysia, secured the second runner-up place. Their presentation was focused on prioritising e-waste covering SDG 12 – Responsible Consumption and Production.**

For the full article, please click this link.

"Without big data analytics, companies are blind and deaf, wandering out onto the web like deer on a freeway."

Geoffrey Moore

Research Collaboration

Staff Name	Department/Centre/Group	Partner / Institution	Validity	Purpose of Scope
Dr Richard Wong Teck Ken Dr Chia Wai Chong Professor Lau Sian Lun	Department of Computing and Information Systems (DCIS)	Sunway Construction Sdn Bhd	5 May 2021-5 May 2022	(a) To improve cooperation between both Parties in the field of Research. (b) To support Parties' research agenda which are to develop expertise, to highlight research, to create knowledge and to build closer relationship between university and industry. (c) To provide opportunities for Sun-U students to engage with real-world problem and provide practical and valuable solutions. (d) To speed-up information technology adoption rate and process innovation in SunCon and its subsidiaries.
Professor Mohammed Khalid	Graphene and Advanced 2D Materials Research Group (GAMRG)	Daikin Refrigeration Malaysia (Sdn Bhd)	9 June 2021-9 June 2022	To strengthen the research collaboration between the two parties.

Sunway R&D Industry Projects

Project Lead	Department	Project Title
Dr Low Yeh Ching	Department of Computing and Information Systems (DCIS)	NPA Data Analytics
Assoc. Prof. Dr Angela Lee Siew Hoong	Department of Computing and Information Systems (DCIS)	Water Purifier (WP) Installation Condition Big Data Visualisation
Dr Mohammad Tahir	Department of Computing and Information Systems (DCIS)	e-Retail Project Development System

FRGS Grants

Project Lead	Department	Project Title
Dr Mohammad Tahir	Department of Computing and Information Systems (DCIS)	Optimizing Energy Efficiency in 5G Ultra-Dense Networks Using Distributed and Cooperative Learning Model

MOSTI Grant

Project Lead	Department/Centre	Project Title
Professor Lau Sian Lun	Department of Engineering (DEN)	Cloud-based intelligent Measurement, Monitoring and analytics System in support of radiation medicine

Upcoming Events

Date(s)	Event
20-22 October 2021	Virtual Seminar: Seminar on "Mitigating Climate Change Through Carbon Dioxide Capture and Utilization Technologies", COP26@ Lancaster University Festival

Welcome New SET Members

Dr Tan Kim Han

Research Fellow

Research Centre for Nano-Materials and Energy Technology

Dr Numan Arshid

Senior Research Fellow

Graphene and Advanced 2D Materials Research Group

Foong Yee Ling

Senior Executive - Administration

SET Admin

Md Nasrun Muhamad

Senior Executive - Laboratory

Department of Engineering

SUNWAY UNIVERSITY

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ENGINEERING DEGREES

Programme duration: 4 years

Towards recognition* by Board of Engineers Malaysia (BEM)

Through BEM, Malaysia is a signatory to the Washington Accord (WA). Following the WA agreement on mutual recognition of engineering qualifications, graduates from BEM-accredited engineering programmes will be mutually recognised for professional registration and eligible to perform professional engineering services in countries such as the US, Canada, UK, Australia, New Zealand, Korea, Taiwan, China, Hong Kong, Singapore, and more.

**Sunway University's Engineering programmes will attain the Board of Engineers Malaysia (BEM) accreditation upon graduation of its first cohort.*

In 2019, Electrical & Electronic Products are Malaysia's largest exports, contributing 38% to the total export, while chemical-related products constitute 22% of total exports. *Source: Matrade 2019*

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JPT/BPP(U)(N/524/6/0089/PA14248)01/28

Careers opportunities in oil & gas industries, oleochemicals (palm oil) industries, food industries, environment, health and safety.

Coming soon in March 2022

CONTEMPORARY SUBJECTS HIGHLIGHT:

Sustainable Engineering Design, Entrepreneurship, Engineering Design for Industrial Revolution 4.0, Environmental & Climate Change, Wastewater Engineering Technology

For more information, please enquire within.