

digest

January - April 2018 Issue



Experiencing German Culture And Innovation
p.4-9



Winner Of The World's Fastest Hyperloop
p.10-11



Industrie 4.0 Research Symposium
p.18

CONTENTS

IN THIS ISSUE

- 03 Director's Message
- 04 Experiencing German Culture And Innovation
- 10 Winner Of The World's Fastest Hyperloop
- 12 Building A More Sustainable World
- 14 Beyond the Classroom
- 16 Perspective Of A Railway Engineer
- 18 The Chatter



EXPERIENCING GERMAN CULTURE AND INNOVATION

Final year Bachelor students gain unique perspectives from their overseas exposure



WINNER OF THE WORLD'S FASTEST HYPERLOOP

The WARR team shares their inspiring journey to winning the world's fastest Hyperloop



BEYOND THE CLASSROOM

Students making industry site visits as part of their curriculum

ON THE COVER

Overseas Immersion Programme: Experiencing German Culture and Innovation - Nur Atiqah Binte Mohd Rashid (Photo 1)
Meet the WARR Hyperloop Team - WARR Hyperloop (Photo 2)
Industrie 4.0: Research Symposium - Israel Tan Photography (Photo 3)

This newsletter is published by:

Office of Corporate Communications
Technische Universität München Asia
SIT@SP Building
510 Dover Road #05-01
Singapore 139660

Tel: +65 6777 7407
Email: info@tum-asia.edu.sg
Website: www.tum-asia.edu.sg
Facebook: www.facebook.com/tum-asia

CPE Registration No. 200105229R (13/06/2017 - 12/06/2023)
German Institute of Science & Technology – TUM Asia Pte Ltd

director's message



As we celebrate the start of a new year, I would like to wish all our readers a Happy New Year. At TUM Asia, 2017 was marked with many special memories for our students, alumni, staff and industry partners. In this issue of DIGEST, we step into 2018 with some highlights from our student body and industry network.

Every year, our final-year Bachelor students eagerly await the arrival of September. This is when most of these students spend a semester in Germany for their Overseas Immersion Programme. It is an opportunity of a lifetime where they get to experience German culture, interact up close and personal in the TUM faculties, and gain exposure to modern German engineering and innovation. On top of these, they learn to prioritize their studies alongside new responsibilities like living on their own in a foreign country. The DIGEST team spoke with six of these students on their life in Munich. Hear from them in our feature interview on pages 4 through 9.

As a university that prides itself on entrepreneurship, we had the pleasure of hosting the WARR Hyperloop leadership team, who shared their inspiring journey from forming a student initiative team to winning the world's fastest hyperloop for two consecutive years in Elon Musk's SpaceX Hyperloop Pod Competition. To learn more about their incredible achievements, turn to page 10.

Industry site visits are common in a TUM Asia student's curriculum. They give our students valuable insight into the industry, along with opportunities to meet experts from renowned companies. In October 2017, we organised two site visits to our industry partners for our Bachelor and Master students. To read more, turn to page 14.

It is also important for us to highlight the study experiences of our students and alumni. The DIGEST team spoke to one of our graduates, Jeryl Yep, who started his own company shortly after graduating from his Bachelor degree, as well as Peng Hiong, a practising railway engineer who decided to pursue his Master degree in Transport and Logistics with a minor in Railway Engineering. To hear about Jeryl's entrepreneurship journey and Peng Hiong's study experience, read their interviews on pages 12 and 16 respectively.

As we step into 2018, I would like to thank our readers, alumni, students, and partners alike who have showed their support throughout the years. We feel honored to have your continuous support and we look forward to greater successes together! May you have an enjoyable read.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Markus Wächter'. The signature is fluid and cursive.

Dr. Markus Wächter
Managing Director, TUM Asia

FEATURE

Experiencing German Culture And Innovation



▲ Ang Shieh Ying

Bachelor of Science in
Chemical Engineering

▼ Nur 'Aisyah Binte Kuyob

Bachelor of Science in
Electrical Engineering &
Information Technology



◀ Ben Ho

Bachelor of Science in
Chemical Engineering

▼ Abdul Yasser Bin Abdul Karem

Bachelor of Science in
Electrical Engineering &
Information Technology



▶ Nur Atiqah Binte Mohd Rashid

Bachelor of Science in
Chemical Engineering

◀ Yu Feng

Bachelor of Science in
Electrical Engineering &
Information Technology

The Overseas Immersion Programme (OIP) is a highlight for most TUM Asia final-year undergraduates. Students spend three to five months at the home campus in Munich, Germany, taking in many new experiences while completing their Bachelor Thesis. In this issue, the DIGEST team catches up with six Bachelor students to learn more about their time in Europe.



Yasser (extreme right) and Yu Feng (second from right) together with their classmates in Germany

We are really happy to hear that you are settling in well in Germany! Can you give our readers an insight to your experience in Germany thus far?

Shieh Ying: I have to say that the study experience in Germany has been a fulfilling journey thus far. Being able to work with industry-sized lab facilities has enhanced my understanding of the various concepts learnt in Singapore. The TUM professors and PhD students explain the theory of the experiments during pre-lab sessions to simulate our thinking for the experiments itself, which is a different learning experience for all of us.

Ben: I agree with Shieh Ying. In Singapore, the lessons generally emphasize more on theory, while over here at the home campus, the lab sessions are more geared towards industrial applications. Despite being in a totally new environment, the learning experience has been fun and enjoyable for all of us.

Atiqah: I would say that being able to experience the German education here for a semester has been awesome. Working with state-of-the-art facilities at TUM have given us a greater exposure to the chemical industry. In addition, we had the chance to work with the German bachelor students, who are friendly and very willing to share their experiences with us. One thing I have learnt from them is to be more participative and vocal during pre-lab tests.

Yasser: It has been a unique experience doing my Bachelor Thesis here in Munich, where we get to experience first-hand what it feels like to be studying in TUM itself. The learning environment here is vibrant and diverse, with students coming not only from Germany but also different parts of the world.

Aisyah: I agree with Yasser. The environment is totally different here in Germany as you can find people from all over the world studying in the same campus as you. The Germans here are very friendly. Often not, I get “good morning” and help with getting around the campus from strangers. On the weekends, I get to enjoy leisure activities that Munich has to offer.

Yu Feng: Studying in Germany has definitely broadened my perspectives on the quality and excellence of German engineering. They offer a unique learning style that emphasizes in-depth understanding and problem solving. This allows us to build a strong theoretical foundation that is essential for tackling problems faced in the engineering industry.

How are you adapting to the culture and lifestyle in Germany? Tell us more about the enjoyable experiences you had so far.

Shieh Ying: In Germany, you will find that beer, butter pretzels and sausages are the common favourites amongst locals. The Germans particularly value punctuality, and you are expected to be on time for all your lab classes. As the culture here promotes work-life balance, shopping malls and supermarkets are usually closed on Sundays. However, you can plan day trips within Germany or travel out of Munich over the weekend to nearby countries that are easily accessible by Flixbus or even Deutsche Bahn trains.

Ben: The transition from a Singaporean lifestyle was easier than expected! The locals have been welcoming and helpful. I would say the food in Germany has been the highlight so far! The weather, on the other hand, required more time to get used to, at least for me.

Atiqah: I really love how environmental-friendly and well-disciplined the Germans are. Their recycle bags are bigger than their trash bags; their escalators are energy saving; their plastic bottles can be recycled with cash rebates at all supermarkets; and they bring their own bags when they shop. I enjoy the fact that I get to make a difference by playing my part to protect earth’s resources.

“Studying in Germany has definitely broadened my perspectives on the quality and excellence of German engineering. They offer a unique learning style that emphasizes in-depth understanding and problem solving.”

Yu Feng

“The TUM professors and supervisors are very friendly and approachable when it comes to sharing their time and knowledge with us. We learn new things every single day, some of which we do not get to learn in school.”

Nur 'Aisyah Binte Kuyob



Yasser: It is not quite as daunting as it seemed, as we had the freedom to plan our own schedule and work on our theses at our own pace. Moreover, I get to experience Munich with my fellow classmates from Singapore. This gives me a sense of familiarity and makes every day enjoyable and interesting!

Now that you are in Germany working with your professors and their staff in a field of research, what observations have you made?

Atiqah: I noticed that they are very interactive and knowledgeable. They would share more than the notes handed to us and help us relate the lessons with industrial applications. Even if you have the slightest questions on the subject, they are very willing to answer them and help clear your doubts.

Yasser: They provide us with huge insights to state-of-the-art technology used in modern industries, and how our thesis topics are relevant in providing advancements in these industries. Our professors' experience in their respective fields has been a great source of help in advancing our thesis research as well as gaining the practical know-how of modern technology.

Aisyah: The TUM professors and supervisors are very friendly and approachable when it comes to sharing their time and knowledge with us. We learn new things every single day, some of which we don't get to learn in school. Well, we get the best of both worlds!

Yu Feng: The German professors and supervisors whom I am assigned to for my Bachelor Thesis taught me the proper methodology to understand and tackle engineering problems. They are very meticulous, hardworking, and encouraged us to understand the background information related to our thesis. This independent form of learning differs from the style of learning back in Singapore. Personally, I have learned the most during this 3-month period of our education journey.



Yasser (right) enjoying the outdoors with his classmates



Atiqah (extreme left) experiencing winter with her classmates

Tell us more about your Bachelor Thesis and it's relevance to our environment.

Shieh Ying: My thesis requires me to analyse the performance of the NiAlOx catalyst using the carbon dioxide methanation reaction which requires a catalyst that is reactive at low temperature and would be selective to methane. Methane is being used as a fuel in industries for electricity production. By converting carbon dioxide into methane, it helps to reduce carbon dioxide in the atmosphere and reduce global warming.

Atiqah: I am investigating the topic of "Supported Transition Metal Catalysts for the Methanation of Carbon Dioxide". The methanation of carbon dioxide is an alternative method for energy storage besides wind and solar energy options. By investigating these catalysts, there are potentially more efficient ways of storing renewable energy and this would benefit us all in the long run. I chose this topic as I am interested in green chemistry.

Yasser: My topic is about implementing "Computed Torque Control with Gaussian Process Regression in Robotics". It is a method of control for robotic manipulators using a stochastic process which involves a multivariate Gaussian Distribution. I was inspired to choose this topic when I witnessed how the stochastic process - taught by our German lecturers - was being applied to real-life implementations and problems.

Aisyah: My thesis topic requires me to implement an Android application interface that will help users to visualize the stiffness of robots graphically. I chose this topic because I am interested in robotics. Also, I get to learn how to implement an Android application, which I have never tried before. It has been very fun to work with the project!

Yu Feng: My topic revolves around machine learning and artificial intelligence. It seeks to better understand the collaborative effort between a human and a robot in a specific task, such as assistive dressing. I chose this topic because I had an interest in machine learning and have always wanted to delve deeper into the topic and experience for myself how working in the field of machine learning would be like.



Photos: Ben, Yasser, Atiqah, Shieh Ying, Aisyah

What is the one thing you will miss the most about Germany when your OIP ends?

Atiqah: I will miss the fresh air and the scenic views a lot! Furthermore, Munich is close to many neighboring countries in Europe. I will definitely miss the luxury of crossing borders easily and exploring beautiful landscapes and cities.

Yasser: The weather of course! And the fact that there are many places you can visit both in and outside of Germany that are accessible from Munich itself. Some of the highlights for me are the Deutsches Museum, the world's largest museum of science and technology; the beautiful alpine Lake Königsee located in Berchtesgaden; Zugspitze, the highest mountain in Germany; and not forgetting the nearby European countries such as Austria, Italy and Switzerland.

Yu Feng: The one thing I would miss the most is being with my classmates throughout the entire programme. We constantly looked out for each other and shared many fond memories together, such as going to Oktoberfest together after lessons, and even going for short trips around Europe.

Now that you are coming to the end of your Bachelor studies, what are some of your thoughts looking back on your journey here in TUM Asia?

Shieh Ying: I am thankful for the opportunity to be part of the Student Management Committee as I had the chance to interact with my fellow schoolmates as well as to acquire new skills such as event planning. I am also grateful for a bunch of wonderful friends who made university life so much easier. Last but not least, I am fortunate to be able to learn from TUM professors who had flown in from Germany to share their experiences and knowledge personally with us. University life at TUM Asia has been very fulfilling for me and I would not trade this experience with anything else.

Yasser: It was not easy but it has been a rewarding journey. We were able to gain valuable knowledge from our German professors, who often challenged our limits in terms of critical thinking and problem solving. Due to the small class size here in TUM Asia, it was easy for us to approach and interact with our German lecturers, making the entire learning experience a fruitful one.



Yu Feng: How time flies! From entering TUM Asia as a freshman, to completing the journey together with my classmates, I vividly remember how more than half of the class stayed up overnight, slept in the classroom, and came back on the weekends to revise for exams. It was during such tough times when camaraderie was formed and I am glad to have such friends to go through university life with.

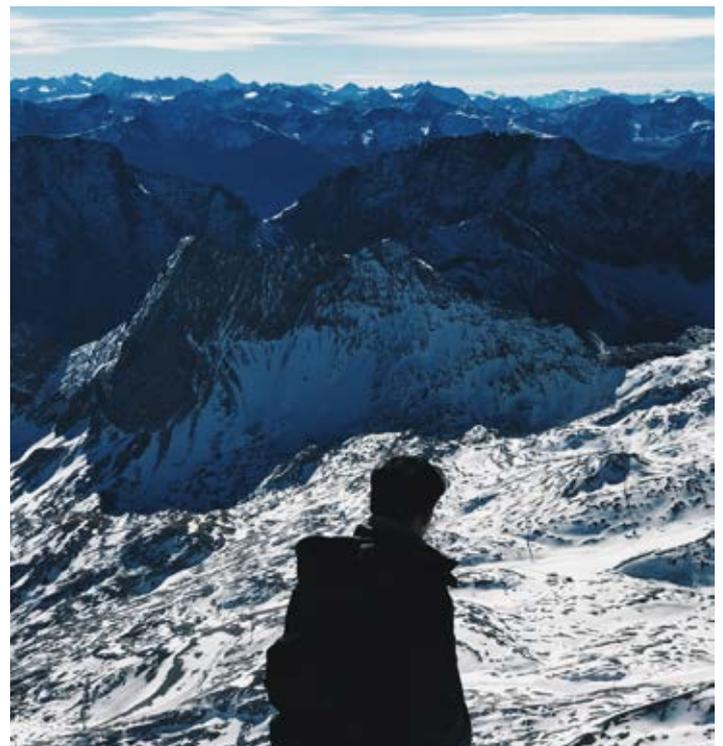
What advice will you share with your juniors as you complete your university journey?

Ben: Do try to balance time between study and play as the modules would come by very quickly. Also, having friends around was important for me, especially when I had to cope with difficult modules. Studying together and helping each other out would be my advice to any undergraduate student.

Atiqah: Germany's engineering and technology is one of the best in the world but this means it will also be challenging. It is important to have discipline while finding passion for what you study, as this is what will help you make your way through!

Yasser: It is a challenge itself to pursue a German bachelor degree, but the limitless number of takeaways and learning experiences one can gain from this course will prove to be useful not only in the aspect of future careers, but also the other aspects of life. I can confidently tell you that our German professors always provide us with tough but relevant problems that relates to real-life applications and these challenges make for a very fulfilling pursuit of education.

Yu Feng: I would say, go for it! Even though there will be challenges along the way, the learning experience and knowledge gained is worth it as you are able to learn from some of the best professors in the engineering field. Forge a strong bond with your classmates as they are the ones who will motivate you and push you through the final lap.



It is a challenge itself to pursue a German Bachelor degree, but the limitless number of takeaways and learning experiences one can gain from this course will prove to be useful not only in the aspect of future careers, but also the other aspects of life. ”

Abdul Yasser Bin Abdul Karem



I am fortunate to be able to learn from TUM professors who had flown in from Germany to share their experiences and knowledge personally with us. University life at TUM Asia has been very fulfilling for me and I would not trade this experience with anything else. ”

Ang Shieh Ying



Photos: Ben, Shieh Ying, Yasser

Winner Of The World's Fastest Hyperloop



WARR Hyperloop, winner of SpaceX Pod Competition 2017

“From Singapore to Kuala Lumpur in half an hour, that is the vision for the future of mobility.”

Hosted by TUM Asia, the WARR Hyperloop team from TUM was in Singapore on 9 and 10 November 2017 to share their success story of building the world's fastest hyperloop pods that have set two world-records. The speakers include Mariana Avezum, founder of the WARR hyperloop team, Thomas Ruck, project co-lead, as well as Manfred Schwarz, team lead of the formula student team.

The Hyperloop is a new transportation concept that allows pods to travel through low-pressure tubes at the speed of sound. The idea was first introduced in 2013 by Elon Musk, founder of PayPal, Tesla Motors, and SpaceX. The annual SpaceX Hyperloop Pod Competition challenges student teams from around the world to invent their own Hyperloop prototype and then race it against the other teams in the SpaceX Hyperloop Test Track. The WARR Hyperloop team won both previous competitions and achieved a world record for the fastest Hyperloop run in August 2017.

Over three sessions, the team shared valuable insights with students in Singapore on their journey. From assembling a full student-volunteer team, crowdfunding for over half a million Euros, and to building the actual pods, their innovative journey has been remarkable, yet it was not without challenges. One major hurdle the team had to overcome was adapting to the new set of rules applied in the second competition, focusing solely on 'maximum

speed'. Within a span of six months, the team worked on overhauling its previous prototype to produce a different and significantly lighter version. At the end of the competition, the team broke new grounds and secured a top speed of 324 km/h—the fastest speed ever reached by a Hyperloop pod.

What started as a student initiative is now taking steps towards advancing Elon Musk's vision for a Hyperloop high-speed transport system. The team will be taking part in the third SpaceX Hyperloop Pod Competition in 2018 and aims at continuing its success of winning. The team encouraged any TUM Asia student who will be heading to Munich for an internship or thesis to look for the opportunity to join and contribute to the success of the WARR team's pursuits in 2018.



Elon Musk with the WARR Hyperloop Team



Building A More Sustainable World

▼ **Jeryl Yep**
Class of 2017
Bachelor of Science in Chemical Engineering



Jeryl (left), with his classmates during his Overseas Immersion Programme in Munich

After graduating from TUM Asia with a Bachelor of Science in Chemical Engineering, Jeryl Yep went on to start his own company, Green Transition, with a vision to build a more sustainable world. In this issue of DIGEST, he shares the motivation behind his business idea.

Hi Jeryl, can you give our readers a short introduction about yourself?

Jeryl: I graduated last year from the Chemical Engineering programme at TUM Asia and proceeded to start work shortly after. During my work stint, my friend and I decided to start on a project that turned out to hold real potential for investment. This led to the start of our own company, named “Green Transition”. Currently, the company is still very much in its infancy stage. With time, we are working towards building a company that would be able to stand up to the challenges of climate change and global warming.

Congrats on your graduation earlier this year! Can you share with us what were some of the highlights of your Bachelor studies in TUM Asia?

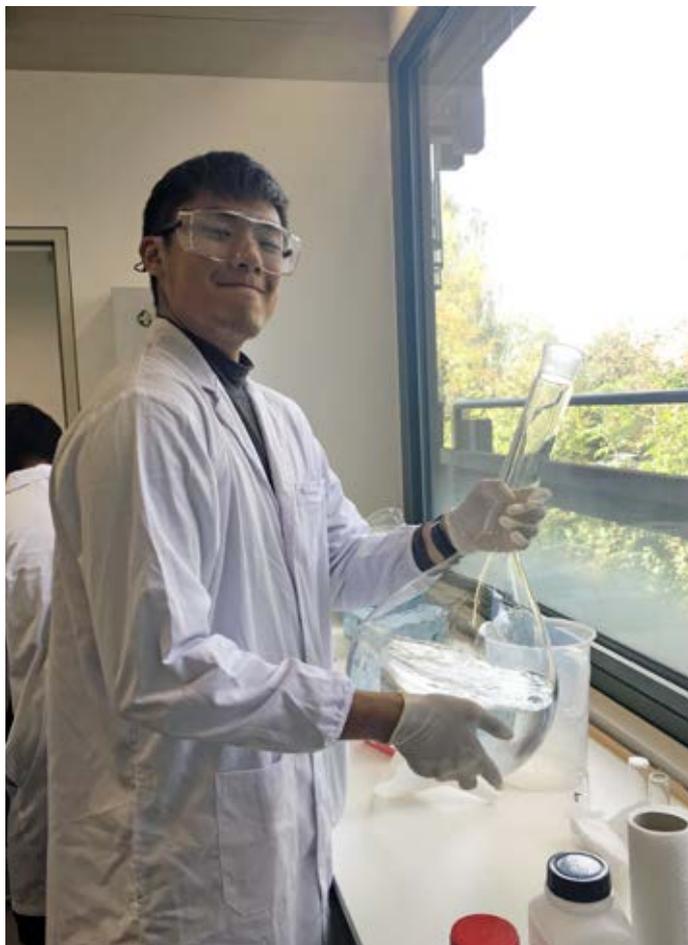
Jeryl: I look back on my studies and can proudly say that the best highlight for me was the Overseas Immersion Programme (OIP) that took place during

the last semester of our studies. Besides that, I enjoyed having classes taught by both local and German lecturers, who carry different sets of values and mindsets, but are equally competent and experienced in the field of engineering. This has helped me broaden my perspectives on Chemical Engineering.

Can you tell us more about your company and what was your inspiration behind this business idea?

Jeryl: Green Transition was founded with the aim of helping people from all over the world to live a greener and more sustainable lifestyle by providing them with the company’s very own innovative products and solutions. A huge inspiration for my co-founder and I would be our passion for the environment and the awareness of environmental problems such as climate change and global warming. We thought that a good way of doing so would be to get everyone involved. By providing sustainable alternatives to our everyday life, we can help to lower our impact on the environment. able to work together well.

“By asking questions, you are able find opportunities that others are missing, gaps in the market that needs to be filled, as well as solutions that are not yet discovered.”



Can you share with us an example of these sustainable alternatives in our daily life?

Jeryl: Unfortunately, our products are currently confidential right now and we are unable to give specific details. However, I can share that one of the ideas we are working on is a reinvented air conditioner that will use only a fraction of the power currently used by a commercial air-conditioner. By exploring alternative technology, air conditioning can be reinvented to provide thermal comfort to users with a much lower energy consumption, thus lowering its overall carbon footprint.

As an entrepreneur with a background in Chemical Engineering, how do you see yourself making an impact in the environment in the near future?

Jeryl: Having a background in Chemical Engineering has helped me understand and become aware of existing problems in the industry that affect the environment, such the carbon footprint of chemical or heavy industries. As we were well-trained in critical thinking and problem solving, I have learnt the need to go beyond seeing a problem to finding ways and solutions to overcome them. By leveraging on my understanding of industry processes, I can work on finding ways to lower the carbon footprint.

What advice would you give to students who are also considering setting up their own business after their studies?

Jeryl: My advice for them would be to always ask questions and seek answers. By asking questions, you are able find opportunities that others are missing, gaps in the market that needs to be filled, as well as solutions that are not yet discovered. Do not be afraid to challenge the status quo, because you can only make a difference when you are willing to make a change.



Photos: Jeryl

Beyond The Classroom: Industry Site Visits



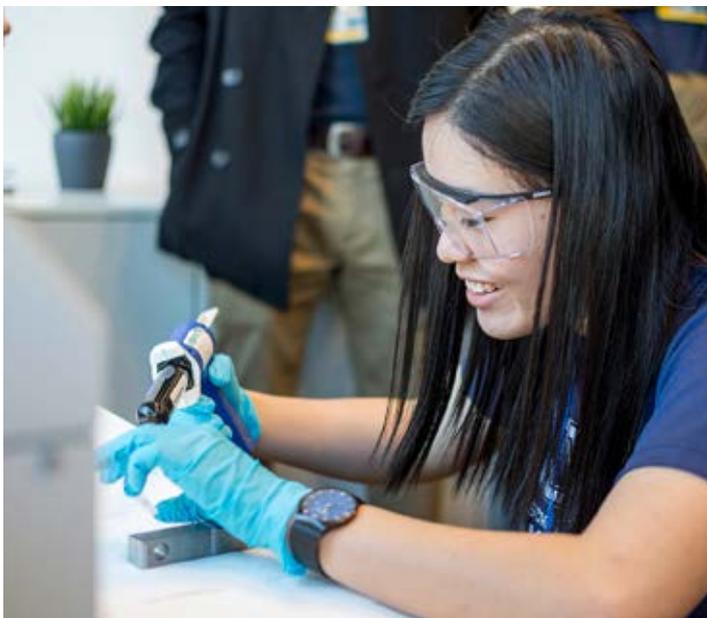
Chemical Engineering Undergraduate students at DELO Germany

It is important to learn industry-relevant theoretical concepts in the classroom. However, learning also takes place beyond the classroom. At TUM Asia, the university encourages students to not only learn through the guidance of their professors, but also to acquire real hands on practical experience. For this purpose, yearly site visits are conducted to help our students gain greater exposure to the industry, both within and outside Singapore.

On 11 October 2017, the Industrial Chemistry Master students paid a visit to the Singapore facilities of Linde Gas, a global leading company in the industrial gases market. From a field trip to the plant site to interactions with the experienced engineers

on site, the students gained a fruitful experience learning about the operations of the gas industry.

On 16 October 2017, a total of 62 Chemical Engineering students made a visit to DELO in Germany, during the students' Overseas Immersion Programme. DELO, a leading manufacturer of industrial adhesives for different sectors that has been in operations for more than 50 years, welcomed the students for a short visit. The students attended lectures on adhesive applications and laboratory practice and participated in company tours to find out more about the latest developments in the industry. Ms. Sabine Herold, Managing Director of DELO, was also present to meet the students during the visit.



Industrial Chemistry Master students at Linde Gas Singapore

STUDENT FEATURE

Perspective Of A Railway Engineer



Peng Hiong Tham ▼
Master of Science in Transport & Logistics

Peng Hiong (middle in blue), with his classmates and lecturer

With years of experience in the railway industry, Peng Hiong decided to pursue a Master degree in Transport & Logistics with a minor in Railway Engineering to enhance his knowledge and skills. The DIGEST team speaks to him to find out his more about his education journey so far.

Hi Peng Hiong, can you share with our readers a short background of yourself?

Peng Hiong: I am currently working with Land Transport Authority (LTA) of Singapore, a statutory board which spearheads all land transport development in Singapore. Over the years, I had the opportunities to be involved in several land transport projects such as the Driverless Mass Rapid System (North East Line), Sengkang and Punggol LRT, Boon Lay Extension, Circle Line, and Marina Coastal Expressway Project.

Out of the three specialisations offered in the Transport & Logistics programme, what made you decide to choose Railway Engineering?

Peng Hiong: As Singapore moves towards a 'car-lite' future, there will be many more railway projects coming up to achieve this vision. I want to be well trained and prepared for the challenges ahead, given the complexity of a fully automated transit system in Singapore. As TUM Asia offers a specialized Masters

programmed in Railway Engineering, I decided to pursue the opportunity to enhance my railway knowledge.

How has it been like studying in TUM Asia?

Peng Hiong: I had the chance to know many international friends from India, Germany, Spain, and China, and everyone is very friendly and helpful. There were also study trips organised by TUM Asia, which were not only informative, but also great fun for the class. The lecturers were friendly, approachable and very patient to explain the concepts taught during classes.

We hear that you are in Munich conducting your Railway Engineering semester. Can you share how that has been going for you?

Peng Hiong: I am currently attending elective modules for Railway Engineering and at the same time working on my Master Thesis in Munich. As my thesis involves building a simulation model of the

railway track system, I had to conduct tests in the laboratory to validate the results. The opportunity to witness these tests being carried out by experienced laboratory staff has been an eye-opening experience for me.

What are some of the highlights from the Railway Engineering modules?

Peng Hiong: The Railway Engineering modules provide a complete overview of various aspects of railway, from rail planning and design to the study of railway systems such as rolling stock, train control and signaling. We were also able to learn from the lecturers about the history of rail transport in Germany, which greatly enhanced our learning experience.

What do you think Railway Engineers need be prepared for with regards to overcoming the challenges in the industry?

Peng Hiong: The railway system is a complex system which requires multi-disciplinary types of engineers to work together to overcome challenges. It is important that railway engineers develop good communication skills in order to solve problems with engineers from other disciplines.

How do you see yourself making an impact to the engineering community in the near future?

Peng Hiong: With the new knowledge that I have acquired, I will be able to provide value-added engineering support to railway projects and contribute to the development of railway industry. With an increasing number of railway projects coming up, it is important that the railway systems provide a convenient, efficient and safe mode of travel for the



“With the new knowledge that I have acquired, I will be able to provide value-added engineering support to railway projects and contribute to the development of railway industry.”



Photos: Peng Hiong

The Chatter



Industrie 4.0 Research Symposium

Beyond the Hype: The Impact of Industrie 4.0 on our Social and Political Landscape

The Technical University of Munich Asia (TUM Asia) has partnered the Employment & Employability Institute (e2i) and the German Academic Exchange Service (DAAD) to host a Research Symposium in Singapore on the theme of “Beyond the Hype: The Impact of Industrie 4.0 on our Social and Political Landscape” at Devan Nair Institute for Employment and Employability from 16 to 17 October 2017. The one-and-a-half day symposium, jointly supported by the Embassy of the Federal Republic of Germany, hosted over one hundred participants across different organisations and institutions.

Speakers at the symposium included Prof. Dr. Christoph Luetge, Peter Löscher Professor, Chair of Business Ethics and Global Governance, Department of School of Governance, Technical University of Munich (TUM); Prof. Boh Wai Fong, Head of Division, Division of Information Technology and Operations Management, College of Business (Nanyang Business School), Nanyang Technology University (NTU); as well as Dr. Olga Sourina, Head of Cognitive Human-Computer Interaction, Fraunhofer Singapore. Prof. Dr. Christoph Luetge explored the political and ethical concerns of disruptive innovation in Industrie 4.0, while Prof. Boh Wai Fong discussed the future of changing enterprises and jobs as well as the strategies to respond to these changes. Dr. Olga Sourina also shared an interesting topic on “Human Factors in Industrie 4.0”, explaining how humans are a centre of interaction in the Cyber Digital and Physical worlds.

Through this symposium, the attendees were granted a comprehensive overview of social and political implications of Industrie 4.0 on the human capital eco-system as well as applications of disruptive technologies such as robotics and cybersecurity. As Singapore’s industrial sector continues to face unprecedented challenges amid global economic changes, the social and political implications created by these Industrie 4.0 disruptive innovations and technologies are not to be ignored. To be fully prepared for the changes ahead, there is a need for the industry to work together to create a strong socio-political-technological fabric to provide an environment where policies, strategies, businesses and research can be ready to adopt and leverage on new technologies to their advantage.

Photos: Israel Tan Photography



Photo: FESTO Didactic

1st Industrie 4.0 Specialist Diploma Offered In Singapore

With the rise of Industrie 4.0 (Industry 4.0), where the internet of things and automation are revolutionizing manufacturing, the industry is looking to upskill its workforce to further equip the next generation's workforce. In 2016, Festo Didactic SE and TUM Asia signed a Memorandum of Understanding (MoU) to explore and develop joint education programmes, for students and employees interested in upskilling themselves in the areas of Automation Technology and Industrie 4.0 in Singapore. One of the outcomes from the MoU is the launch of the Specialist Diploma in Advanced Digital Manufacturing, which is the first Industrie 4.0 Specialist Diploma being offered in Singapore.

The specialist diploma will commence in January 2018 and is open for individuals who are interested to upgrade their skills and learn from German experts who are the key drivers of Industrie 4.0. The modules will be taught by experts from TUM and qualified Festo Didactic trainers, with quality instructional time emphasized using a block teaching system. Participants will also be able to gain hands-on experience using Industrie 4.0 training equipment and be equipped with relevant Industrie 4.0 knowledge and skills to make an impact in the industry.

TUM Asia held an information session on 8 November 2017 to share with interested participants more information about the course details and module synopsis. It was a successful turn-out where engineers and professionals from the manufacturing sector and related industries were present to find out more about the benefits and opportunities that the course has to offer.



Photo: TUM Asia

To find out more about the Specialist Diploma, please contact the Office of Executive Development at exd@tum-asia.edu.sg or call +65 6777 7407.

WE GAVE THE WORLD REFRIGERATION TECHNOLOGY

Photo: The Linde Group; The testing station for refrigeration machines built in Munich in 1888, where the first trials in air liquefaction took place. In the foreground are two small air liquefiers.

With 150 years of academic excellence in engineering, the Technical University of Munich (TUM) is no stranger to engineering breakthroughs. In 1868, a young man named Carl von Linde was appointed as a professor at the TUM. Von Linde was drawn to the refrigeration research field and often included theories of refrigeration machines in his syllabus. He went on to invent refrigeration technology, resulting in the production of the modern refrigerator and other spin-offs such as air-conditioning machines.

Join the ranks of engineering greats at the Technical University of Munich, Germany's #1 University*.

Degree programmes available at TUM's Singapore campus:

- Bachelor of Science** (Chemical Engineering) by Technical University of Munich
- Bachelor of Science** (Electrical Engineering & Information Technology) by Technical University of Munich
- Master of Science (Aerospace Engineering) by Technical University of Munich and Nanyang Technological University
- Master of Science (Green Electronics) by Technical University of Munich and Nanyang Technological University
- Master of Science (Industrial Chemistry) by Technical University of Munich and National University of Singapore
- Master of Science (Integrated Circuit Design) by Technical University of Munich and Nanyang Technological University
- Master of Science (Transport & Logistics) by Technical University of Munich

Admission for Bachelor and Master degrees are open.
Visit www.tum-asia.edu.sg to find out more.

 [facebook.com/TUMAsia](https://www.facebook.com/TUMAsia)

 info@tum-asia.edu.sg

*As ranked in the 2015 QS Rankings and the 2011, 2012, 2013 and 2016 Shanghai Rankings (ARWU)

**In partnership with Singapore Institute of Technology (SIT).

TUM Asia is a 100% subsidiary of the Technische Universität München / www.tum.de. TUM Asia is recognized as an Institute of Higher Learning (IHL) in Singapore.
CPE Registration No. 200105229R / Reg. Period: 13/06/2017 - 12/06/2023

TUM Asia