

# M o m e n T U M

TUM ASIA EVENTS, HIGHLIGHTS  
& ALUMNI STORIES

2020 | Edition 02

TECHNICAL  
UNIVERSITY  
OF MUNICH (ASIA)



Organised By

TUM Asia

In Partnership With

FESTO

Supported By

SKILLSfuture SG

## EXECUTIVE EDUCATION COURSES INDUSTRY 4.0

APPLICATION TO THE 2020 INTAKE IS NOW OPEN

We invite you to further your engineering skills with executive education courses from the **Technical University of Munich (TUM) Asia**. Benefit from our industry-relevant executive education offerings, partnerships with the industry and funding support of **up to 90% SkillsFuture funding available**.



### OUR TOP INDUSTRY 4.0 COURSES

#### Specialist Diploma in ADVANCED DIGITAL MANUFACTURING

*6 Modular Certificates, 280 Contact Hours*

- Gain an overview of the essentials of advanced manufacturing systems
- Obtain deep insights on effective organisation of manufacturing processes
- Develop skills and experiences required in designing IIOT systems
- Apply software development approaches for development of CP systems with integrated Industry 4.0 features

#### LEARN Programme (Stage 1)

#### ENGINEER YOUR SMART FACTORY BLUEPRINT

*3-Day Workshop, 24 Contact Hours, 6 Hours Pre-Assessment*

- Understand and apply SIRI and the Prioritisation Matrix
- Understand core principles, frameworks and methodologies of i4.0
- Determine aspirational state of company guided by business objectives
- Generate actionable problem statements in Industry 4.0 focus areas
- TÜV SÜD solution taxonomy and Fraunhofer digital media technology

#### CREATE YOUR COMPETITIVE EDGE FOR INDUSTRY 4.0

Be ready for i4.0 job roles  
with the right skills!

For more information or to find out more about the latest course schedule, please contact:

TUM Asia, Office of Executive Development  
Ms. Zara Mohd  
exd@tum-asia.edu.sg  
6777 7407 ext 138



Find out more at  
[www.tum-asia.edu.sg/exd](http://www.tum-asia.edu.sg/exd)

## PRESIDENT EMERITUS AND DIRECTOR'S MESSAGE



**G**reetings to all our readers! Since publishing the first issue of the MomenTUM newsletter, in the blink of an eye, much has changed in the world. Many activities around the world have come to a standstill due to the COVID-19 pandemic. Companies had to close their physical offices, while those that continued to operate had to find new ways to continue their operations remotely from home.

At Technical University of Munich (TUM) Asia, we worked together to adhere to advisory guidelines laid out by the Singapore Government that were imposed due to concerns over escalating COVID-19 infections in the country. Back in February 2020, we started implementing initiatives to do our best to keep our TUM Asia family as safe as possible. This TUM Asia family comprises our staff, lecturers, and students. We switched to remote learning for all our programmes and conducted our lectures over Zoom to ensure the safety of our students and lecturers. Another reason why we had to adopt remote learning early and familiarise ourselves with new interactive platforms was due to Singapore's restrictions on short-term travellers from all countries, which meant that our TUM professors could no longer fly to Singapore to teach.

By offering our lecture content digitally, we have been able to allow our students and professors to stay safe in the comfort of their homes, with students continuing to benefit from the same quality of education.

All lessons are conducted through live streaming on secured online platforms and are also available as recorded video content. The live streaming sessions are managed centrally by TUM Asia to enforce standardised security settings consistently across all teaching staff. These measures enhance the security of our online lessons to ensure a safe teaching and learning environment for our students and teachers, while allowing lectures to remain interactive like they were on campus.

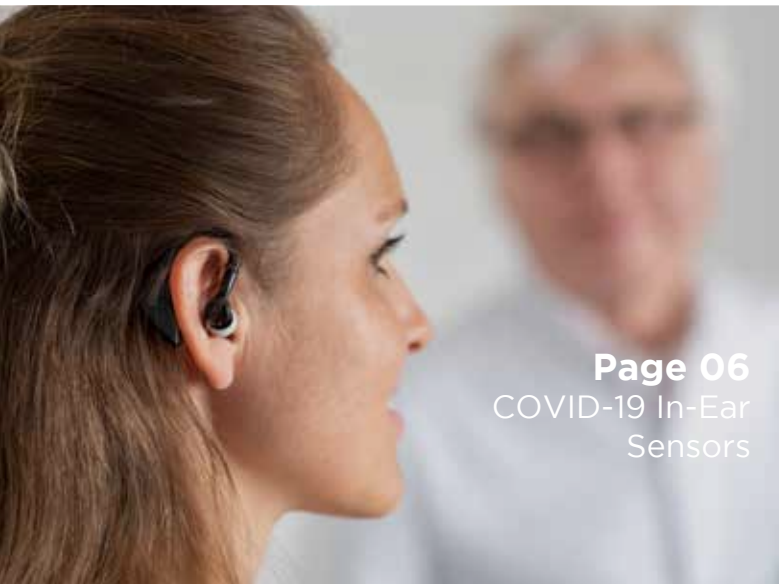
In this issue of MomenTUM, we speak to some of our students who share their thoughts on their time at TUM Asia. They also talk about how they have been adapting to the changes in their lessons and share encouraging messages to the TUM Asia community. Be sure to check out their messages in this issue.

We also hear from one TUM professor who has developed an in-ear wearable sensor with his team to contribute to TUM's fight against COVID-19. This device aims to speed up the detection of worsening symptoms in COVID-19 patients, so that promptness of treatment can ease the burden on the healthcare system and reduce the need for intensive treatment. Read more about the details of the in-ear sensors in this issue.

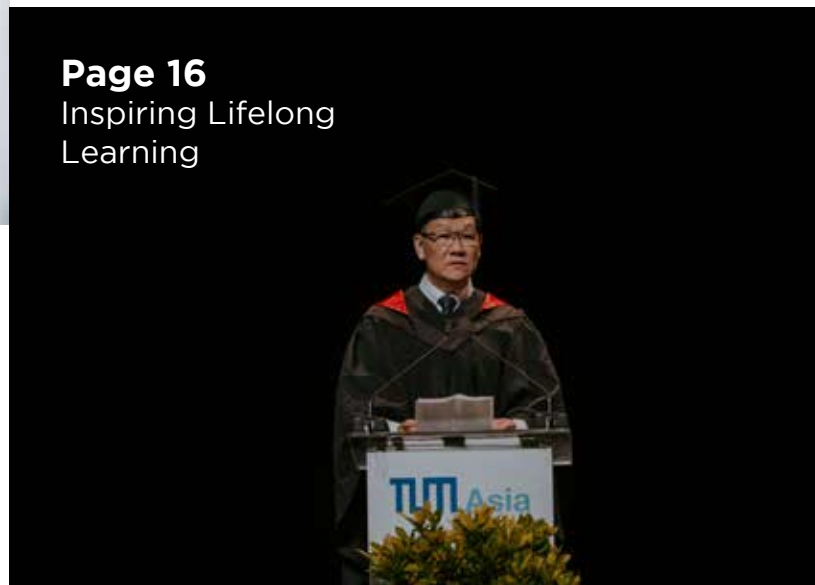
TUM Asia has never been defined by a physical location, but a shared love for the place we call home. Whether near or far, our community is strengthened by this resilience. We hope that this situation can be overcome very quickly and that we would all emerge stronger after this crisis. With this, I would like to wish all our readers to stay safe and in good health!

**Prof. Dr. Wolfgang A. Herrmann**  
President Emeritus,  
TUM

**Dr. Markus Wächter**  
Managing Director,  
TUM Asia



**Page 06**  
COVID-19 In-Ear  
Sensors



**Page 16**  
Inspiring Lifelong  
Learning

## TABLE OF CONTENTS

---

### **6 COVID-19 In-Ear Sensors**

Can continuous monitoring provide protection for patients?

### **9 QRONITON Covid-19 Tracing Service Developed At TUM**

How do we track the spread of COVID-19 efficiently without losing our privacy?

### **10 Rising Above Adversity amid COVID-19**

We delve into the thoughts of our students on the current COVID-19 situation.

### **16 #WeMissTUMAsia**

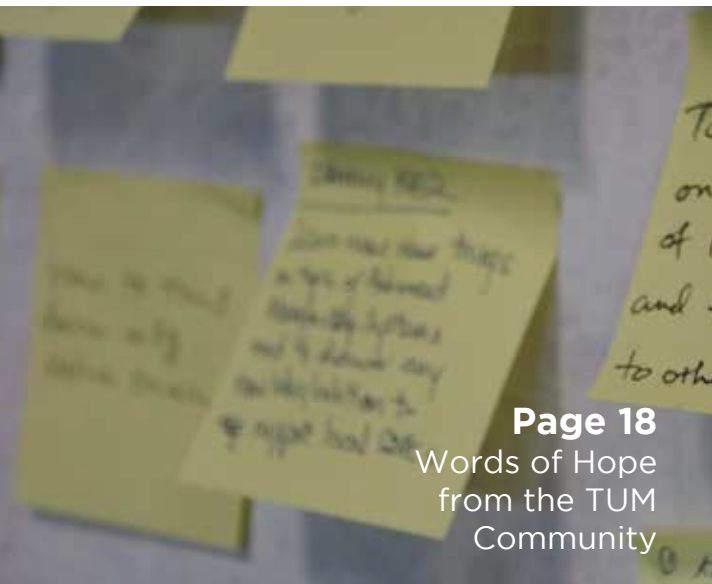
Here are some photos of the TUM Asia's family to reminisce on the fun experiences you've had in class!

### **18 Inspiring Lifelong Learning**

Hear more from Danny, a 62-year-old veteran in the industry, on why he continues to upskill and pursue TUM Asia's Specialist Diploma.

### **21 Words of Hope from the TUM Community**

Our very own TUM Asia's students share inspirational messages to encourage our TUM Asia community and society at large.



**Page 18**  
Words of Hope  
from the TUM  
Community



**Page 26**  
Remote Learning @  
TUM: Frequently Asked  
Questions

**23 Highlights: SIT-TUM's Bachelor of Engineering Programme (Honours)**

We share some of our programme's highlights that make us stand out from the crowd.

**26 In the Hunt for New Treatments against the Coronavirus**

Find out how TUM's newly developed online data analysis platform helps research groups to know which existing drugs might be suitable for the treatment of COVID-19.

**28 Remote Learning @ TUM: Frequently Asked Questions**

How will COVID-19 affect your studies or MSc application at TUM Asia?

© MomentUM

Published on: August 2020

**Photo Credits:**

- Cover Page: iCaption
- Page 06 - 08: TUM, Andreas Heddergott
- Page 09: TUM, Uli Benz
- Page 10 - 15: iCaption
- Page 16 - 17: Israel Tan Photography, iCaption
- Page 18 - 20: TUM Asia, Israel Tan Photography
- Page 21 - 22: TUM Asia, Sim Li Gek Julie, Ali Hassan Khan, Ng Zhi Heng Nicholas, Dias Neil Clyde Sergie
- Page 23 - 25: TUM Asia
- Page 26 - 27: TUM, Photographer Ricky John Molly, Tom Schulte (FOM)
- Page 28 - 29: TUM Asia
- Back Page: TUM Asia



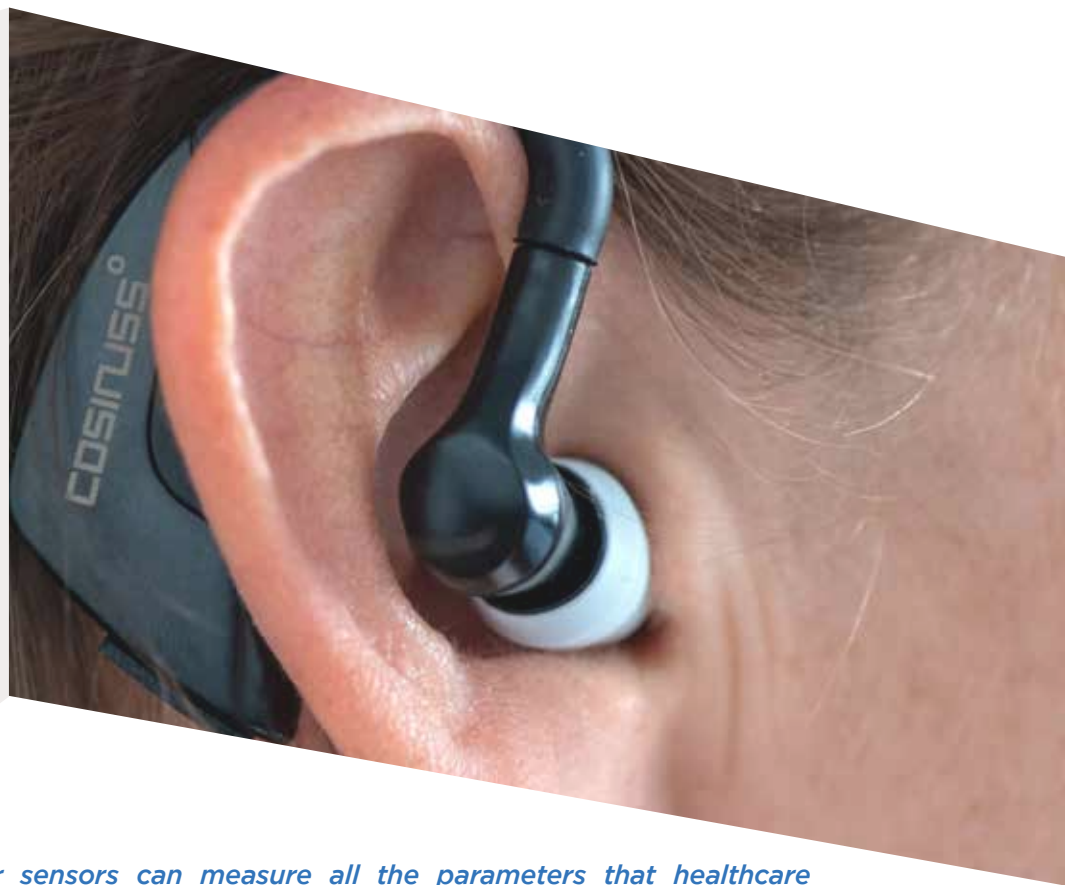
**PROF. GEORGE SCHMIDT**  
HEAD OF BIOSIGNAL ANALYSIS WORKING GROUP  
TECHNICAL UNIVERSITY OF MUNICH (TUM)  
KLINIKUM RECHTS DER ISAR

# COVID-19 IN-EAR SENSORS

## *Can Continuous Monitoring Provide Protection for Patients?*

Prof. Georg Schmidt, head of the Biosignal Analysis Working Group at TUM's university hospital, shared with us more about the high-tech biometric sensors developed by his team, which enables effective 24-hour monitoring of COVID-19 patients in home isolation.

**“Compared with smartwatches, in-ear sensors can provide particularly meaningful data.”**



► *The in-ear sensors can measure all the parameters that healthcare professionals require and transmit the information to a small computer via a Bluetooth connection before forwarding it for analysis.*

**Hi Prof. Dr. Georg Schmidt, can you share with us more about your role at TUM?**

I am Co-Director of the Department of Cardiology, Head of the Biosignal Analysis Working Group and Chair of the TUM's Ethics Committee.

**What are your thoughts about the COVID-19 coronavirus?**

The illness caused by the new coronavirus, COVID-19, can be roughly divided into two stages. During the first stage, in which symptoms are not acute, infected individuals can generally remain at home. In serious cases, this is followed by a second stage with worsening symptoms in which some patients develop severe pneumonia. In these cases, patients must be admitted to a hospital as quickly as possible. The sooner they receive good medical treatment, the better the prognosis.

**Your team plans to use in-ear sensors to monitor COVID-19 patients. How did this idea come about?**

For more than 20 years, my team and I have been developing algorithms for risk prediction

in different clinical settings. We preferably used biosignals that could be taken non-invasively from the body surface without damaging the skin. Examples are signals that can be continuously recorded, such as electrocardiogram (ECG), blood pressure, temperature, oxygen saturation and acceleration in space. We were also interested in using sensors that provide particularly good and stable biosignals. In our search for such sensors, we came across a sensor that could be placed in the outer ear channel. At the beginning of 2020, our preparations were completed for a large study on risk prediction in elderly general population, in which this ear sensor would be used as a data source.

In the spring, when COVID-19 hit the world at full force for the first time, I realised that our sensor was particularly well suited for monitoring COVID-19-positive patients in domestic isolation, since it allows for an early detection of a deterioration of the patient's condition.

We also hope that prompt treatment will ease the workload of intensive care units by eliminating the need for intensive treatment, including mechanical ventilation, in some cases.

## What would typically happen if a patient's health worsens?

The sensor is inserted into the ear canal, similar to a hearing aid. The patient is asked to wear the device 24 hours a day in order for us to continuously monitor their vital parameters measured by the sensor. These parameters include blood oxygen saturation, heart rate, respiration rate and body temperature. If one or more parameters start to cause concern, we will contact the patient to prepare them for a possible hospitalisation.

## What are the implications of these in-ear sensors?

It will further enhance the close cooperation between science, first responders and the healthcare department. Under a doctor's supervision, a team of specially trained medical students in a "TeleCovid-19 center" at Klinikum rechts der Isar tracks the incoming data 24/7. In case the data, checked against pre-defined parameters, indicate that a patient's condition is deteriorating, this will be reported directly to first responders to ensure that the patient will be immediately transported to a hospital.

## Were there any scientific/technical challenges that you faced while implementing this study? How did you overcome

At the beginning of our study, we had to rely on data from South Korea to define acceptable limits to the vital parameters for this disease. With experience and validation studies in our department, we have been able to gain confidence in both the defined limits and the quality of the measurement.

## How is the progress of the study going so far?

The study got off to a quick start thanks to donations from TUM's patrons and supporters. After a first wave, the incidence of COVID-19 in Germany has been quite low for some time. We used this time period to optimise our workflow. We are confident that we are now well prepared for the possible second wave.

## Would there be any challenges to implement your invention on a large scale in the event of an extremely huge outbreak?

In the event of a major, localised outbreak, we are already able to continuously monitor quarantined patients with our system. Since we are expecting



▲ Prof. Schmidt has been cooperating with *cosinuss*, a Munich-based start-up that originated with a doctoral thesis topic at TUM, for some time. The company's in-ear wearable sensors use optical processes, among other technologies, to capture biodata.

a nationwide second wave, we are planning a multicentre study which we will conduct together with the Charité Berlin and the University Hospital Heidelberg. The respective preparations have now been largely completed.

## How do you think that engineers, such as students from TUM, can prepare themselves to contribute in the fight against COVID-19, or to overcome any other threats to the world?

I think that passion is an especially important quality. Find something you are passionate about and try to educate yourself as much as possible. We need engineers and scientists who are not just experts in a very narrow field, but who are open-minded and always ready to tackle new challenges.

---

PROF. GEORGE SCHMIDT

---

*"I think that passion is an especially important quality. Find something you are passionate about and try to educate yourself as much as possible. We need engineers and scientists who are not just experts in a very narrow field, but who are open-minded and always ready to tackle new challenges."*

---



# QRONITON COVID-19 TRACING SERVICE DEVELOPED AT TUM



The latest regulations require restaurants to record the contact details of their guests to help the authorities to issue warnings in case of COVID-19 infections. A team at the Technical University of Munich (TUM) has developed an IT service that simplifies the registration and contact tracing process while protecting personal data.

In these days of the COVID-19 pandemic, visits to public places generally involve filling out forms. These require users to scan QR codes or to complete online forms. “In both cases, unauthorised persons can access personal data, which may have serious consequences especially in connection with a critical issue such as an infection,” says Georg Carle, Professor of Network Architectures and Services at TUM.

Still, effective contact tracing is important for successfully limiting the spread of pandemics, says Prof. Carle. In search of a solution, he worked with his former doctoral candidate Johann Schlamp to develop QRONITON. This service, which uses QR codes that can be scanned with a mobile phone, will enable organisations to meet their documentation obligations and help public health authorities to identify endangered individuals quickly. Any location can be provided with an individual QR code. When scanned by a user, the code is captured along with a time stamp and contact data.

**What sets this solution apart from similar approaches is a sophisticated, multi-stage encryption system that protects the data.**

#### Restricted access

“The data are stored centrally on a server,” says

Georg Carle. “However, it is encrypted in a form that cannot be read by the server operator, and which the authorities can access only in the form of subsets – and even then, only with the consent of the concerned parties.”

**If an infection is reported to a public health authority, it will provide a personal authorisation code to the infected individual. The authority can access data on the places visited and the direct contact persons only if the infected person enters the code in QRONITON.**

QRONITON is a browser-based tool, which means that the user does not need to install an app. It also means that users can be sure that data are not being collected in the background.

The project was closely monitored by researchers at the TUM Munich Center for Technology in Society (MCTS), who focused in particular on issues surrounding the acceptance of such systems. They also helped to ensure that QRONITON is compatible with the German General Data Protection Regulation.

“The system is now ready to be rolled out for everyday use,” says Prof. Carle.”

*Source: TUM.de, TUM Asia*



## RISING ABOVE ADVERSITY AMID COVID-19

In this issue, we interview three TUM Asia students and find out more about their motivations to join TUM Asia, what they hope to achieve after graduation, as well as their thoughts on the current COVID-19 situation.

### WU QING, MASTER OF SCIENCE IN INTEGRATED CIRCUIT DESIGN

---

**Hi Wu Qing, tell us more about yourself!**

Hi, I am Wu Qing from the 2019 cohort of Master of Science in Integrated Circuit Design (ICD).

**What motivated you to come to Singapore and study a Master's degree?**

I heard about the TUM ASIA ICD programme from my senior during the fourth year of my undergraduate studies. This programme sounded really interesting to me, inspiring me to find out more about graduate education in Singapore. Eventually, I chose to study in Singapore as both TUM Asia and NTU enjoy a high academic reputation all over the world.

The ICD programme is a good choice for me to pursue my graduate studies here as I can benefit a lot from this experience and gain insights that would last a lifetime. Another reason is that Singapore experiences a beautiful summer throughout the year, providing an enjoyable time for all international students.

**What is one thing that you miss about your home country?**

I think I really miss Taobao in China, which is such a big online shopping website and brings lots of convenience to my life. One can buy everything from this magical website.

***“Thanks to additional precautionary measures implemented by the Singapore government and TUM Asia, we are able to study in a safe conducive environment during this crisis. We feel safe and assured.”***



**How have your classes and life been these days amidst the current situation (COVID-19)?**

Because of COVID-19, all courses have changed to online learning. Though the arrangement is alright for us, I do feel that sometimes, online classes result in lesser communication and interaction between the professor and students, compared to face-to-face classes. Thanks to additional precautionary measures implemented by the Singapore government and TUM Asia, we are able to study in a safe and conducive environment during this crisis. We feel safe and assured.

**What do you hope to achieve after graduating from TUM Asia?**

I hope I can gain as much knowledge as possible and make friends with my foreign classmates. For me, my utmost concern is to obtain an ideal job after completing my studies.

**Any encouraging message for your fellow students?**

The joint TUM Asia-NTU ICD programme is really

useful. You can learn lots of new modules and we also have two lab modules in which you can apply theory into practice. Half of our professors are from TUM while the other half are from NTU, hence you can experience two different kinds of teaching styles and gain different perspectives. Hope you can join us soon!

---

**WU QING**

---

***“The joint TUM Asia-NTU ICD programme is really useful. You can learn lots of new modules and we also have two lab modules in which you can apply theory into practice.”***

---



## DELANO DEAN BROWN, MASTER OF SCIENCE IN RAIL, TRANSPORT, AND LOGISTICS AND LOGISTICS

### **Hi Delano, tell us what inspired you to study logistics with TUM in Singapore?**

I am from Portmore, Jamaica. I have previously obtained a Bachelor of Science in Civil Engineering from the University of the West Indies, and am currently studying Masters of Science in Rail, Transport and Logistics (RTL) at TUM Asia.

### **What motivated you to come to Singapore and study a Master's degree?**

I wanted to learn more about transport and how we can move people and goods more effectively. It wasn't so much about the country, but the courses offered by the TUM Asia RTL programme. Being in Singapore has been helpful. Observing Singapore's public transport system and learning how the transport demand

is being managed has reinforced some of the lessons learned in the course.

### **What is one thing that you miss about your home country?**

I miss my family as I have a tight-knit family and enjoy being around them. We communicate as often as possible through digital means, but I still miss them.

### **How have your classes and life been these days amidst the current situation (COVID-19)?**

Since the outbreak of COVID-19, our classes and exams have moved online. I actually prefer the face-to-face interaction with the lecturers, so I'm still adapting to this new form of learning. Fortunately, I have completed most of my classes before COVID-19.



***“Access to these opportunities (Education, Healthcare, Career) is important in bridging this disparity. I can do my part by contributing to the development of sustainable transport systems.”***

**What is one challenge faced by the world that you wish you could solve and how would you do it?**

One pressing challenge I wish I could solve is the disparity between wealth and opportunity. Many factors contribute to this; one of which is the ability of one to access such opportunities. Access to these opportunities (Education, Healthcare, Career) is important in bridging this disparity. I can do my part by contributing to the development of sustainable transport systems.

It has been more than 7 amazing years living in Singapore! I feel most comfortable, most at home in this country. But of course, occasionally I do miss the snow!

**What do you hope to achieve after graduating from TUM Asia?**

I would love to contribute to transport issues in my country. Major improvements can be made to our public and active transport systems. This may include improving pedestrian spaces, introducing bicycle lanes or rationalisation of public transport to include some form of rapid transit. I'm also fascinated with handcarts (as used in Jamaica) and would like to explore possibilities to improve their operation.

**Any encouraging message for your fellow students?**

Changes in learning, loss of part-time jobs and the uncertainty of finding internships during this period have made the past few months trying. The uncertainty of the future can be stressful, but it also provides us with opportunities to adapt and be inventive. I would encourage everyone to stay hopeful, be positive and remember the reasons why you chose to embark on this journey in the first place. And in these times let us be our brother's keepers.

---

**DELANO DEAN BROWN**

---

***“I would encourage everyone to stay hopeful, be positive and remember the reasons why you chose to embark on this journey in the first place. And in these times let us be our brother's keepers.”***

---



## LO PANG-KAI, MASTER OF SCIENCE IN INDUSTRIAL CHEMISTRY

---

### **Hi Pang-Kai, tell us more about yourself!**

Hi! I'm an outgoing youth from Taiwan. You can also call me Banker. After the first year of coursework, I started my internship as a data analyst at Air Liquide Southeast Asia Cluster in Singapore. My hobby is playing basketball. We play basketball once a week in NUS with our Singaporean or Taiwanese friends, and this has become one of my best memories in Singapore. Also, I love adventuring, travelling and scuba diving. I have just become a certified advanced open water diver in Malaysia last November, and I can't wait to explore more of this world. I believe that the world is so big that if you never try to explore it, you will never know how tiny you are.

### **What motivated you to come to Singapore and study a Master's degree?**

I love to embrace challenges. I have always yearned to leave my comfort zone to pursue an international career. TUM Asia helps me to achieve exactly what I want! The TUM-NUS joint programme in Industrial Chemistry gives me not only a degree from recognised and reputable

world-class universities, but also practical and novel knowledge that correlates strongly with industry experience. What really attracted me to the IC programme was the chance to start our career in both Germany and Singapore! Singapore is one of the leading countries in the Asia-Pacific region, and engineering graduates can have more opportunities in the fields of semiconductors, petrochemistry, or Fast-Moving Consumer Goods Industry, etc. Compared with other countries, I truly get more options in Singapore, and I'm really looking forward to demonstrating my capabilities in the Lion City!

### **How do you stay positive during this COVID-19 pandemic?**

It's hard to deny that COVID-19 has severely affected how the whole world operates. But, as an international student, we cannot concede defeat. If we think differently, we would realise that the Circuit Breaker also provides us with more time for ourselves. Besides the remote courses from TUM Asia, I have also used my free time to learn Python (a programming language) from online platforms as this skill would come in



***“I have always yearned to leave my comfort zone to pursue an international career. TUM Asia helps me to achieve exactly what I want!”***

handy during my internship. Indeed, this is the best time for us to strive for excellence in what we do!

**How have your classes and life been these days amidst the current situation (COVID-19)?**

There are still some interactions. Although lectures remain the same, what the professors bring to us during online lessons is still different. In our previous face-to-face classes, some professors would bring relevant experiments to class to help us to understand better what is being taught. Moreover, if we knew our professors well enough, we might even be able to seize the chance to talk about our Master theses or have general discussions about our learning trajectory. With no sign of the COVID-19 crisis easing, professors and students may no longer be as close as before.

**What is one challenge faced by the world that you wish you could solve and how would you do it?**

As a frequent traveller and an avid scuba diver, environmental issues are some of the challenges I care most about. When I just arrived in Singapore, I was really shocked that people could get more than three or even four plastic bags in a single transaction at the supermarket. Styrofoam packaging and straws are being used everywhere. This situation is a far cry from what I am used to in Taiwan. Being a potential chemical engineer, it is our responsibility to dedicate ourselves to eco-friendly material development and process optimisation to reduce chemical waste, air pollution, and other pollutants that may be emitted in the production process.

**What do you hope to achieve after graduating from TUM Asia?**

For me, I hope to find a job as an engineer in

a global enterprise in Singapore or Europe to continue gaining industrial experience and knowledge of the latest technology after graduating. After this, I hope to switch careers to a management or other positions that can help the company in its decision-making processes. This is also what I've been taught at TUM Asia and NUS: Try to do something grander beyond just engineering in our career!

**Any encouraging message for your fellow students?**

I'd like to share a catchphrase: “Why Not?”, from my favorite basketball player, Russell Westbrook, a point guard for the Houston Rockets in NBA. His words and story helped me to understand that when I meet any obstacles or challenges in my career or future, I should always maintain a positive attitude and believe “Why am I not the chosen?” to face these!

---

**PANG KAI**

---

***“I hope to switch careers to a management or other positions that help the company in its decision-making processes. This is also what I've been taught at TUM Asia and NUS: Try to do something grander beyond just engineering in our career!”***

---

# #WEMISSTUMASIA



*We are missing our TUM Asia campus at the SIT@SP building. Take care of yourselves! #WeMissTUMAsia #Stayhomestaysafe #Practicesocialdistancing #Circuitbreaker*

During the COVID-19 period, lessons are being held online. We understand that many of you miss meeting your friends during face-to-face lessons, and miss TUM Asia as well. Fear not! As we ride through this pandemic, we will emerge as a stronger TUM Asia family. In the meantime, here are some photographs of the TUM Asia family where you can reminisce on the fun experiences you've had in class!



We miss our TUM professors, who fly from Germany to Singapore to teach! We miss seeing all of our students in class too!

Featuring photo of Dr.-Ing. Michael Joham at TUM Asia, who teach in our Electrical Engineering Bachelor's programme.

#Throwback #WeMissTUMAsia  
#Stayhomestaysafe #Homebasedlearning



The TUM Asia community has never been defined by a physical location, but instead a shared love for the place we call home. Whether near or far, our community is strengthened by this resilience.





## INSPIRING LIFELONG LEARNING

**DANNY KER, STUDENT, SPECIALIST DIPLOMA IN  
ADVANCED DIGITAL MANUFACTURING**

TUM Asia offers a wide selection of Executive Education courses. One of our offerings is our Specialist Diploma in Advanced Digital Manufacturing, taught under the direct guidance of German industry experts, which equips participants with relevant Industry 4.0 knowledge and skills as well as hands-on experience with Industry 4.0 training equipment to prepare them for more complex job roles to meet new technological challenges in the Advanced Manufacturing Industry. We interviewed a participant of the programme, Danny Ker, and asked him about his experience. Let's hear more from him.

**Hi Danny! Do share with us about the company you work in and your current role and responsibilities.**

My company is TÜV SÜD PSB Pte Ltd. A recognised testing body, TÜV SÜD PSB is a

service provider for a comprehensive and integrated suite of product testing, inspection and certification services. Its test reports and product certification marks are well accepted by manufacturers, third-party buyers and government authorities worldwide. There are



▶ *Learning never stops: Even at the age of 62 years old, Danny continues to learn and acquire knowledge to stay ahead of the changing landscape.*

more than 500 employees in my organisation. Over at TÜV SÜD PSB Pte Ltd, I am the Vice President for Quality Management. I manage and oversee all the ASEAN branches for quality control, quality assurance and regulatory compliance. I also provide quality oversight for all testing, inspection, certification and auditing activities in line with our corporate laboratory, quality and safety management systems and in compliance to applicable international and local regulatory and statutory guidelines. In addition, I also oversee development, improvement and implementation of laboratory, quality and safety improvement plans and drive continuous monitoring and process improvements for ASEAN countries. I manage six staff at the Singapore office and five staff across ASEAN. I strive to achieve customer satisfaction, compliance and legal standards, and certification in my work.

**How do you see TUM Asia’s Specialist Diploma helping you achieve your career aspirations?**

The decision to take up TUM Asia’s Specialist Diploma came about at a time when I wished to expand my expertise and continue learning to enhance my knowledge and keep pace with the changing business environment, so as to stay ahead of the changing landscape, notwithstanding the fact that I am 62 years old.

Furthermore, the Singapore government is moving towards realising its vision of a Smart Nation by integrating technology into the management of infrastructure and industries. In this regard, TUM Asia’s Specialist Diploma can help me to achieve my aspirations. Through capitalising on what I have learnt from various professors and applying the knowledge I have gained, I can implement these emerging

technologies and arrive at new solutions to support the industries I manage.

**What motivated you to continue with your learning journey even though you are already successful in your career?**

My motivation has always been to pursue lifelong learning to keep myself relevant to market needs and add value to the industries in ASEAN.

Many people may feel that holding the Vice President position represents a successful career. In my view, I don’t consider myself having reached the peak of a successful career. Instead, my career development strategy is based on the target I set out to achieve in the early stages of my career planning - specifically in 1978 - that is to attain one to two professional certificates per year and to acquire incremental knowledge.

**At which point in your career did you decide to do that?**

I started my first job when I completed National Service in 1979. I realised that many of my servicemates landed well-paying jobs because they had either diploma or degree certificates, which enabled them to find a job easily or switch jobs without difficulty. For me, I hailed from a poor family and did not have the luxury to further my studies. This situation motivated me to work in the day and study in the evening then. Even till today, I continue to strive to keep on learning. My commitment to lifelong learning has driven me to acquire more than 58 professional certificates to date.

**Besides TUM Asia's Specialist Diploma course, what other options are you considering?**

Currently, I am considering taking a course on Python programming for high-level programming language to develop desktop graphical user interface (GUI) applications, websites and web applications for machine learning. This will complement the Industry 4.0 revolution and Singapore's journey towards a Smart Nation nicely.

**What triggered you to start looking for a programme like the one offered at TUM Asia?**

TUM is amongst the most prestigious and best universities in Europe, and perhaps in the world too. Furthermore, the Industry 4.0 initiative was pioneered in Germany. German Engineering is recognised for its quality, excellence and assurance worldwide. Initially, I wanted to propose to my management to sponsor my study leave for a couple of years in Germany. However, after browsing TUM Asia's website, I came across information about TUM Asia's Specialist Diploma and made the decision to sign up for it.

**What has been the greatest benefit you have received from the programme since graduation?**

Some of the greatest benefits I received from the programme was that I have gained a clearer understanding of the application and implementation of Industry 4.0 concepts in industries, which complements my experience and background on excellence in business management. I have also gained knowledge on how to support industries and SMEs on how to move towards digitalisation to further improve their productivity and efficiency.

---

DANNY KER

---

*“Some of the greatest benefits I received from the programme was that I have gained a clearer understanding of the application and implementation of Industry 4.0 concepts in industries, which complements my experience and background on excellence in business.”*

---

**As Singapore continues to adopt Industry 4.0, what are some exciting things that the industry can expect?**

Some of the exciting things we can expect in the near future is how machine learning can enable learning, reasoning and decision-making outside of human interaction. Machine learning is a subset of artificial intelligence that can help people and businesses achieve key goals, drive critical decision-making, and create new and innovative products and services for customers. Both machine learning and artificial intelligence complement Industry 4.0 initiatives. It is indeed going to be interesting to see how the future pans out with these technological breakthroughs.



*“My motivation has always been to pursue lifelong learning to keep myself relevant to market needs and add value to the industries in ASEAN.”*

## WORDS OF HOPE FROM THE TUM COMMUNITY

In this section, our very own TUM Asia students share inspirational messages to encourage our TUM Asia community and society at large. Let's take a look at what they have to say to uplift our spirits!



**Sim Li Gek Julie**  
**Student, Masters of Science in Rail, Transport and Logistics**



*“The coronavirus outbreak occurred during our second semester and with the commencement of Singapore’s ‘circuit breaker’ measures, our classes were shifted online in March. However, the transition to home-based learning turned out to be surprisingly smooth. Students and lecturers alike made extra efforts to be more ‘present’ during our Zoom sessions and we adapted quickly to the new normal. Our lecturers also leveraged technology effectively to bring the classes to life, including the use of additional cameras to sketch scenarios and illustrate train movements.*”

*Our cohort is fortunate to have had Semester 1 on campus where we had the opportunity to bond with fellow classmates in person, and forge friendships and camaraderie. Let’s continue to stay positive and connected to support one another. I am sure we will emerge from this situation stronger together, and be ready for new challenges ahead as we embark on our theses and internships in the coming months!”*

**Ali Hassan Khan**  
**Student, Bachelor of Science in Electrical Engineering and IT**

*“This pandemic has indeed been a challenge for us all, more so for some than for others. However, it has also allowed us to look at life in a different manner – to care a little more, to connect a little more. It has shown us that no matter how technologically advanced we get, we have to remember our roots. We have to look out for each other and help each other out. Together as one regardless of race, religion or background, we can overcome anything. So, donate, communicate and most importantly, stay safe.”*



**Ng Zhi Heng Nicholas**  
**Student, Bachelor of Science in Electrical Engineering and IT**



*“One of the things that I am most excited about when the pandemic situation eases would be to catch up and have meals with friends and to cherish some quality time with them. To be able to have some laughs while hanging out together will definitely be something for me to look forward to. Personally, I think that this pandemic has taught me how to deal with sudden changes that arise and how I can better deal with such changes in the near future. Remember a saying by Robert Schulle: ‘Tough times don’t last, tough people do’.”*

**Dias Neil Clyde Sergie**  
**Student, Masters of Science in Aerospace Engineering**

*“The COVID-19 pandemic certainly hinders face-to-face interactions but also facilitates digital learning through online means. In a virtual learning environment, we have the opportunity to learn together and even raise queries during lectures. Professors are best able to understand the questions conveyed through Zoom chat and e-mail, thus facilitating an appropriate study atmosphere. This situation potentially allows us to effectively allocate our time to pursue a cross-disciplinary online course, to set a weekly schedule for ourselves, and to return to a hobby we are passionate in. The virtual classes also offer a forum to develop our communication skills and inspire us to break out of our comfort zone.”*



# HIGHLIGHTS: SIT-TUM'S BACHELOR OF ENGINEERING PROGRAMME (HONOURS)



► *TUM's new 4-year Honours programmes - Bachelor of Engineering in Chemical Engineering and Bachelor of Engineering in Electronics and Data Engineering - combine the best of East and West to equip students with the necessary skills and competencies to address future needs of the world.*

Ever dream of engineering the next invention or pioneering the next revolution in Information Technology? If you do, TUM-SIT's new Bachelor of Engineering Programmes may well be perfect for you! Nurturing enablers to take on the unknown of tomorrow, TUM has rolled out two new 4-year Honours programmes in partnership with SIT: Bachelor of Engineering with Honours in Chemical Engineering and Bachelor of Engineering with Honours in Electronics and Data Engineering.

# BACHELOR OF ENGINEERING WITH HONOURS IN CHEMICAL ENGINEERING

## Combining German Engineering with Asian Relevance

The Bachelor of Engineering with Honours in Chemical Engineering programme is the first and only course in Singapore that equips budding chemical engineers with relevant chemical Industry 4.0 skill set. Students will be equipped with the skills needed to manufacture products through intelligent processes, allowing them to thrive and adapt in the ever-changing and fluid local and global chemical industry. Through this programme, students will gain knowledge in digital value chain integration, seamless asset lifecycle management, and business-to-plant production control. All students will have the option to specialise in either Data Engineering or Additive Manufacturing. Students who select the additive manufacturing specialisation will be taught 3D-printing design, formulation and engineering principles. This programme will therefore train future chemical engineers to integrate digital systems with smart or additive manufacturing seamlessly and effectively. Graduates will thus be equipped for roles in the fine, specialty and petrochemical industries.



◀ *The new joint programme is the first and only course in Singapore that equips budding chemical engineers with relevant chemical Industry 4.0 skill sets.*





# BACHELOR OF ENGINEERING WITH HONOURS IN ELECTRONICS AND DATA ENGINEERING

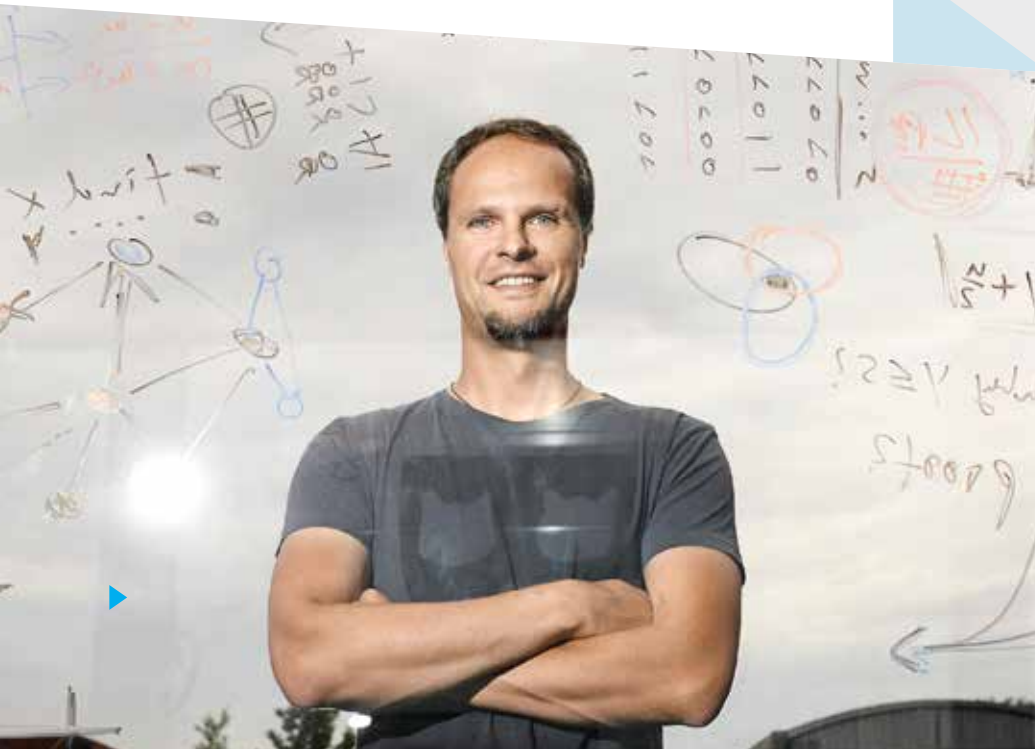


## Riding the Wave of Digital Revolution

The Bachelor of Engineering with Honours in Electronics and Data Engineering programme is a course that combines electronics and data engineering concepts to equip students with the requisite skills and competencies in the emerging digital market. Students will be equipped with deep knowledge in semiconductor physics and circuit design, along with intensive mathematics, to enable them to take on important roles in the data science and machine learning industries. Through these focus areas, students can apply emerging digital technologies set to revolutionise the electronics and semiconductor manufacturing industry, and contribute to new avenues of growth, such as Artificial Intelligence, Internet of Things, data analytics, robotics and automation. Graduates will be fully equipped for roles in technology, particularly electrical and electronics engineer, data engineer, process engineer, Integrated Circuit production and test engineer, as well as application engineer.



# IN THE HUNT FOR NEW TREATMENTS AGAINST THE CORONAVIRUS



**Prof Jan Baumbach, Head of the department of Experimental Bioinformatics**

---

Currently, the coronavirus pandemic is dominating the entire social narrative in many other parts of the world. We are working flat out in order to better help the more than one hundred thousand seriously ill people in hospitals. One promising approach to extending current treatment methods is to use existing and approved drugs to combat the virus.

---

In order to find out which existing drugs might be suitable for the treatment of COVID-19, numerous research groups from all over the world are working on systems medicine approaches. A research team from the Chair of Experimental Bioinformatics (ExBio) at the TUM School of Life Sciences of the Technical University of Munich (TUM) has now developed the first online data analysis platform for this purpose.

## **Systems Medicine and Artificial Intelligence for data analysis**

The so-called Coronavirus Explorer (CoVex) integrates the virus-human interactome for

SARS-CoV-2 and SARS-CoV. CoVex is designed to help provide a comprehensive understanding of the infection mechanisms and focuses not only on the virus and its direct interaction partners, but in particular involves the host-protein interaction network.

“The goal of CoVex is to make data more accessible and analysable with the help of Artificial Intelligence, even for non-computer scientists such as virologists. The virus-host interactome of SARS-CoV-2 serves as the basis for our systems medicine approach,” explains Prof. Jan Baumbach, head of the Department of Experimental Bioinformatics.

## Identification of drug repurposing candidates for treatment of COVID-19

“In particular, candidates for the reuse of known active substances are to be identified using CoVex. These do not target - as most of the existing drugs - directly the proteins of the virus, but against interaction partners in human cells. This makes it more difficult for the virus to escape treatment by mutating its own genome. This can be of great importance in possible future epidemic waves,” said Baumbach.

“Our network-based approach can significantly accelerate the identification of potential drugs for the treatment of COVID-19,” said Prof. Baumbach.

### Data analysis platform publicly available

CoVex is therefore available to biological, medical and computer-based researchers as well as to the general public. Users can already view the latest available molecular data on SARS-CoV-2 and perform systems medicine analyses at <https://exbio.wzw.tum.de/covex/>.

However, Prof. Baumbach emphasises that CoVex is a method for predicting possible future drugs for COVID-19, which have not yet undergone more intensive preclinical or clinical validation. “Under normal circumstances, we would not have gone public with CoVex at this point in time, but since the main functionality is implemented, we believe that this first version is already extremely useful for many researchers,” said the chair holder.

In the coming weeks, CoVex will be continuously updated, for example by incorporating the latest experimental data for COVID-19 and implementing new functionalities. Furthermore, predicted candidates for new COVID-19 drugs will also be pre-clinically tested and investigated.

---

PROF. BAUMBACH

---

*“Our network-based approach can significantly accelerate the identification of potential drugs for the treatment of COVID-19.”*

---



▲ *Find out more about how CoVex works and how it makes data more accessible and analysable with the help of Artificial Intelligence, even for non-computer scientists such as virologists.*



# HOW WILL COVID-19 AFFECT MY STUDIES OR MSC APPLICATION AT TUM ASIA?



In line with the COVID-19 measures set in place by the Singapore government, TUM Asia's campus will continue to remain closed. The TUM Asia office will still be contactable online during office hours for this period.

Following the latest updates from the Ministry of Education, the safe re-opening of education institutions (including TUM Asia) will be done in phases. For the period immediately following 2 June, lectures and tutorials will still be conducted online, and students can return only primarily for practical and lab sessions, including capstone and final-year projects. Please check your emails regularly for more updates.

TUM Asia will take a cautious and gradual

approach in the resumption of our operations, with reduction of physical interaction and implementation of safe management measures to ensure a safe environment for the TUM Asia community. Students will be brought back progressively in a careful and safe manner. However, students will continue having lectures and tutorials online. Measures will be taken to reduce inter-mingling between students on campus.

All lecture content will be delivered digitally and there will be no written examinations for our Bachelor and Master students till at least 1 June 2020, or until further notice.

## Campus Opening & Closing Hours

The SIT@SP building is open from 8am to 6pm on weekdays, and closed on weekends and public holidays. All unauthorised personnel are to leave the campus by 6.30 pm on weekdays, and overnight stay is not allowed.

### Entry Points & Temperature Screening

SIT@SP: Temperature screening will be done at the Polytechnics' entrances and TUM Asia office. Please note that only staff and students on the nominal roll will be allowed entry to the Polytechnics' campuses. All staff are required to display their staff pass at the entry points for identification purposes.

### SafeEntry & TraceTogether

SafeEntry will be deployed at SP's entrances for contact tracing purposes. All personnel entering and exiting the campus will be required to check-in and check-out by scanning a QR code. You are also encouraged to install the TraceTogether app and keep it turned on when leaving home.

SafeEntry & TraceTogether

### Important Declarations to Note

In line with the latest advisory, persons who display fever or flu-like symptoms, or have a family or household member who is unwell, on Quarantine Order or Stay-Home Notice, should not return to campus.

Only those who are back on campus are required to submit their temperature and health declarations on Digital Workplace, on top of checking-in via SafeEntry. They have to do so twice a day, with the first declaration in the morning, and the second after 12.00pm.

Do pay attention to the signs that will be placed at the entry points, listing the declarations that are deemed to be made when you check-in with SafeEntry. SIT takes a serious stance on health and travel declarations. Those who fail to comply or provide false information could face disciplinary actions.

### Safe Distancing & Wearing of Masks

Staff and students who are returning to campus are requested to ensure a safe distance of 1 metre apart wherever possible and refrain from physical interaction with each other. The wearing of masks while on campus is mandatory. Teaching staff may use face shields where applicable.

### What is home-based learning (HBL) and how is it carried out?

During this period, the safety of our TUM Asia community is our top priority and we have rapidly shifted to deliver all lessons digitally. Our students and lecturers are able to stay safe from the comfort of their homes and continue to benefit from the same quality of education.



▲ *During phase 2 of circuit breaker period, students may still return primarily for practical and lab sessions, including capstone and final-year projects.*  
*Disclaimer: Photo was taken before circuit breaker.*

All lessons are conducted through live streaming through Zoom and also available as recorded video content. The live streaming sessions are managed centrally by TUM Asia to enforce standardised security settings consistently across all teaching staff. These measures will enhance the security to ensure a safe teaching and learning environment for our students and teachers, while allowing lectures to remain interactive like they were on campus.

**Q: How are assessments and examinations conducted during this period?**

Presently, not all examinations may be taken electronically. As such, all on-campus written examinations will not be conducted at least until after 1 June 2020. For assessments (e.g. tests, quizzes) and examinations that can be conducted online, instructions will be communicated to you by TUM Asia through email. Please check your TUM Asia email as we will update you regularly.

**Q: Will the quality of the programme/lessons be compromised?**

No, our lessons are still able to continue with the same number of teaching hours. The only difference is that our lecturers and students do not need to commute physically to our campus for lessons, and they are able to benefit from the same quality of education safely at home.

**Q: Can teaching hours be increased (slightly) for us to adapt to home-based learning?**

Teaching hours are tied to the credits that each module carries. There will not be an increase in teaching hours regardless of the delivery mode of the lecture content.

**Q: What is online instruction and what does it mean for me?**

Online instruction comprises digital content through synchronous and asynchronous teaching formats, as well as relevant electronic examinations. You will require internet access and a computer to attend your lessons, access online materials and take electronic exams from home.

**Q: What do I need to know about digital teaching and copyrighted work?**

The materials and presentations made available to students are for educational purposes and are copyrighted work. Students should observe the applicable copyright laws and only use these materials for study purposes. Any further use of these materials

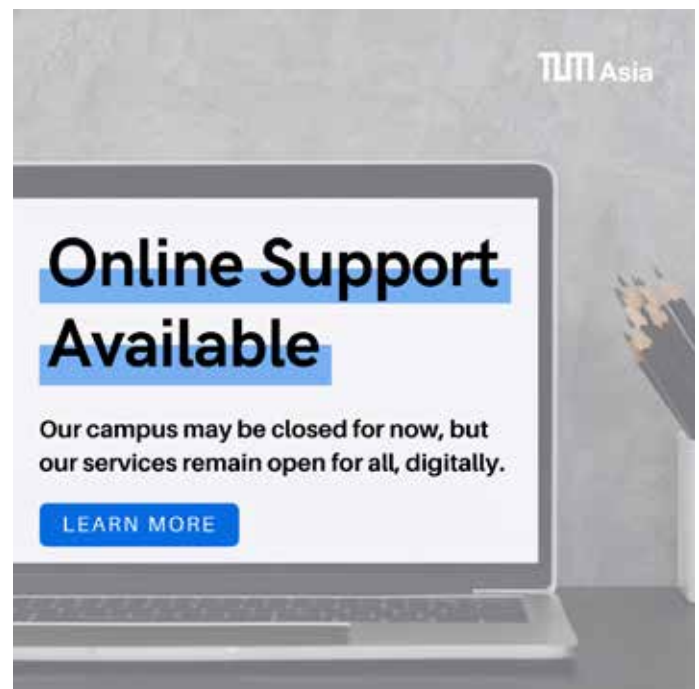
requires the explicit prior consent of the copyright holder. It is forbidden to record or share any digital content with third parties, reproduce them publicly, or use them for commercial purposes.

**Q: I miss interacting with our professors. Will there be any opportunities to connect with them on a face-to-face basis?**

Yes, when things go back to normal, our faculty will be able to travel to Singapore. We will keep our students informed when they are in Singapore and you may make an appointment to meet them in person to clear any doubts related to your modules or for any other learning opportunities. However, for now, do contact them through online means or arrange for a virtual one-on-one video call with them.

**Q: Is there any additional support or study materials available so that we can gain a deeper understanding of our modules?**

Yes, your lecturer will be able to provide some additional resources or advice on platforms to gain access to more materials. You may also research on other study materials and verify these with your lecturer.



150 Years  
culture of  
excellence

**TUM** Asia

# TODAY'S STUDENTS, **TUM**MORROW'S ENGINEERS

Engineer the future with the Singapore campus of  
**Germany's #1 University\***,  
**Technical University of Munich (TUM) Asia**

**BACHELOR  
OF ENGINEERING  
DEGREES**

**MASTER  
OF SCIENCE  
DEGREES**

**EXECUTIVE  
EDUCATION  
PROGRAMMES**

FIND OUT MORE AT [WWW.TUM-ASIA.EDU.SG](http://WWW.TUM-ASIA.EDU.SG)



\*As rated by 2019 ARWU & 2019 QS Rankings.

# TUM ASIA: The Entrepreneurial University in Singapore



**MomentTUM © 2020**

**Published by:**

Technical University of Munich Asia  
Office of Marketing Communications  
SIT@SP Building  
510 Dover Road #05-01  
Singapore 139660

**Tel:** +65 6777 7407 | **Email:** [events@tum-asia.edu.sg](mailto:events@tum-asia.edu.sg)

**Website:** [www.tum-asia.edu.sg](http://www.tum-asia.edu.sg) | **Facebook:** [www.facebook.com/tumasia](http://www.facebook.com/tumasia)

German Institute of Science & Technology - TUM Asia Pte Ltd  
CPE Reg. No. 200105229R (13.06.2017 - 12.06.2023)