Technische Universität München
Undergraduate Programmes

Bachelor of Science in Chemical Engineering
Bachelor of Science in Electrical Engineering & Information Technology
TU MÜNCHEN: THE ENTREPRENEURIAL UNIVERSITY

Founded in 1868, Technische Universität München (TUM) is ranked as Germany’s #1 University* & sits among the Top 50 Universities in the world**. Known as The Entrepreneurial University, TUM has produced 13 Nobel Laureates to date and has groomed many notable inventors, including Rudolf Diesel (Inventor of the Diesel Engine) and Carl von Linde (Inventor of the Refrigeration Technology).

In line with TUM’s entrepreneurial spirit, TUM Asia was set up in 2002 to bring German academic excellence to Asia. Graduates receive the same TUM degree as those in Germany and are able to secure reputable offers from companies anywhere in the world.

Known as a premier address in Europe, a TUM education holds the key to unlock a world of possibilities.

*As rated by Academic Ranking of World Universities 2011, 2012 & 2013 and QS World Rankings 2012/13
**As rated by Academic Ranking of World Universities 2013
This system allows you to focus on one subject at a time, rather than a spectrum of subjects throughout the semester.

Instead of sitting in a lecture hall with hundreds of students, our classes are limited in size to ensure a better learning experience. You get to know your lecturers personally and clarify your doubts in class.

A healthier learning environment where you will be graded solely on your ability to grasp the subject rather than against your peers!

**OUR UNIQUE PEDAGOGY**

**SMALL CLASS SIZE**

**NO BELL CURVE**

**BLOCK TEACHING**
TUM professors have years of experience in the industry and bring with them great knowledge, posing questions for students to solve based on past experiences, which in turn, is highly applicable in the workforce.

GERMAN ENGINEERING
German Engineering is well regarded as the standard of quality worldwide. A German degree equips you with industry relevant skills and knowledge.

ENGLISH, NOT GERMAN!
As the Bachelor programmes are taught in German language at TUM, you benefit by studying in Singapore as the exact programme is taught in English.
BACHELOR OF SCIENCE PROGRAMMES

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This Chemical Engineering degree programme is largely focused on industrial chemistry, dealing with upstream processes of Chemical Engineering.

Students will be exposed to the development and design of chemical processes through laboratory experiments and analysis.

A strong focus is placed on the fundamentals of inorganic and organic chemistry to provide noble solutions to the petrochemical, pharmaceutical and environmental industries.

The Faculty of Chemistry at TUM is ranked first in Germany*

Nobel Prize winners have been produced in this faculty

Placed 13th worldwide in Chemistry*

*As ranked by Academic Ranking of World Universities 2012/2013

GERMAN DEGREE
Conferred by Technische Universität München (Germany) in 2.5 to 3 years

ASIAN RELEVANCE
German engineering excellence combined with modules tailored to suit the Asian industry

INDUSTRY RELEVANCE
Our professors are actively involved in research and cooperation projects with leading industrial companies, allowing them to base the curriculum around the latest technological trends and knowledge

OVERSEAS IMMERSION PROGRAMME
You are required to complete your Bachelor Thesis in Munich at TUM spending 3 to 5 months there
UNDERGRADUATE DEGREE OVERVIEW (180 credits)
Foundation Modules (82 credits): Mathematics (17 credits) + Basic Natural Sciences & Mechanics (20 credits) + Chemistry (45 credits)
Advanced Modules (84 credits): Core Modules (72 credits) + Bachelor Thesis (12 credits)
Professional Qualifications (14 credits): Internship (8 credits) + Cross Discipline (6 credits)
Exemption Package for Articulated Diplomas (18 credits): Biology (4 credits) + Internship (8 credits) + Cross Discipline (6 credits)
DURATION
2.5 years (5 semesters)

COURSE OUTLINE

Year 1
- Advanced Mathematics 1, 2 & 3
- Physics
- Engineering Thermodynamics
- CAD and Technical Drawing
- General & Inorganic Chemistry
- Information Technology 1
- Analytical Chemistry*
- Advanced Inorganic Chemistry*
- Chemical Thermodynamics

Year 2
- Engineering Mechanics 1 & 2
- Materials Science & Engineering
- Chemical Engineering Principles
- Chemical Engineering Design Course
- Basic Quantum Mechanics & Spectroscopy
- Chemical Reaction Engineering and Catalysis
- Organic Chemistry 1 & 2*
- Information Technology 2
- Thermal Process Engineering
- Heat Transfer Phenomena
- Biochemical Process Engineering
- Mechanical Process Engineering

Final Year (1 Semester)
- Chemical Engineering 1* & 2*
- Fluid Mechanics
- Chemical Thermodynamics*
- Bachelor Thesis (Conducted at TUM, Germany)

*Lab Coursework will be required in these modules

PROGRAMME STRUCTURE

For Articulated Diplomas

PROGRAMME STRUCTURE

COURSE OUTLINE

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DURATION
2.5 years (5 semesters)

World-class chemistry & German engineering from Germany’s top university will give the students a bright future for prospective jobs not only in Singapore, but also around the world.

Prof. Kai-Olaf Hinrichsen
Dean, Chemistry Department, Head of Chair of Chemical Engineering (TUM) / Teaching Professor at TUM Asia
For Non-Articulated Diplomas, GCE ‘A’ Levels Graduates, International Baccalaureate & International Students

PROGRAMME STRUCTURE

COURSE OUTLINE

Year 1
- Advanced Mathematics 1, 2 & 3
- Biology
- Physics
- Engineering Thermodynamics
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- General & Inorganic Chemistry
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- Fluid Mechanics
- Materials Science & Engineering
- Chemical Thermodynamics*
- Cross Discipline
- Bachelor Thesis (Conducted at TUM, Germany)
- Industrial Internship

*Lab Coursework will be required in these modules

UNDERGRADUATE DEGREE OVERVIEW (180 credits)

Foundation Modules (82 credits): Mathematics (17 credits) + Basic Natural Sciences & Mechanics (20 credits) + Chemistry (45 credits)

Advanced Modules (84 credits): Core Modules (72 credits) + Bachelor Thesis (12 credits)

Professional Qualifications (14 credits): Internship (8 credits) + Cross Discipline (6 credits)

DURATION
3 years (6 semesters)
Chemical Engineering

CAREER PROSPECTS

WE BREAK THE RULES

Instead of only thinking about your career pathway after graduation, the German education system is designed to be industry relevant from the start.

You will have lecturers and professors with a strong industry background to introduce you to the needs & demands of the industry. Coupled with networking sessions and our close cooperation with internationally renowned companies, you will be a step ahead of your peers when graduation comes round.

Education at TUM encompasses current knowledge of applied sciences with strong ties to industrial application. Our teaching focuses on the most important topics of today's chemical research while supporting creative and independent thinking.

Prof. Dr. Stephan A. Sieber
Chair of Organic Chemistry II (TUM) / Teaching Professor at TUM Asia

TUM achieved a score of 96.1 for “Employer Reputation” in the QS World Rankings 2013/2014.

Singapore is one of the world's leading chemical hubs, and with the extensive development of Jurong Island (attracting investments in excess of S$35 billion), the demand for a well-trained pool of technically skilled engineers is on the rise.

For more information on Career Prospects in the Chemical sectors, do log onto www.tum-asia.edu.sg/prospects-after-graduation
Bachelor of Science in
ELECTRICAL ENGINEERING & INFORMATION TECHNOLOGY

PROGRAMME STRUCTURE

Electrical Engineering & Information Technology forms the foundation of the digital age and are among the prime engines of technological and economic progress.

Students are offered a head start on the challenges of the future in areas as diverse as automotive technology, power engineering and electronics engineering, with applications ranging from green energy to electronics, medical technology, space satellites and household appliances.

The rapid developments in information and communications technology in particular underscore the tremendous importance of Electrical Engineering & Information Technology.

1. TUM is ranked first in Germany for Engineering & Technology*
2. Fourth-best among all Technical Universities in Europe*
3. Placed 17th worldwide in Engineering**

*As ranked by Academic Ranking of World Universities 2012/2013 and 2013/2014 **As ranked by QS World Rankings 2013/2014

GERMAN DEGREE
Conferred by Technische Universität München (Germany) in 2.5 to 3 years

ASIAN RELEVANCE
German engineering excellence combined with modules tailored to suit the Asian industry

INDUSTRY RELEVANCE
Our professors are actively involved in research and cooperation projects with leading industrial companies, allowing them to base the curriculum around the latest technological trends and knowledge

OVERSEAS IMMERSION PROGRAMME
You are required to complete your Bachelor Thesis in Munich at TUM spending 3 to 5 months there
PROGRAMME STRUCTURE

For Articulated Diplomas

**UNDERGRADUATE DEGREE REQUIREMENTS** (180 credits)

**Foundation Modules** (120 credits):
- Physics (24) + IT (16) +

**Advanced Modules** (42 credits):
- Electives (30) + Bachelor Thesis (12)

**Professional Qualifications** (18 credits):
- Internship (12 credits) +
- Cross Discipline (6 credits)

**Exemption Package for Articulated Diplomas** (18 credits):
- Internship (12 credits) + Cross Discipline (6 credits)

**DURATION**
2.5 years (5 semesters)

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**COURSE OUTLINE**

**Year 1**
- Calculus 1 & 2
- Linear Algebra
- Circuit Theory 1 & 2
- Digital Technology
- Algorithms and Data Structures
- Computer Technology
- Physics
- Electricity & Magnetism

**Year 2 & Year 3**
- Calculus 3
- Discrete/Numerical Mathematics (Choose either)
- Measurement & Sensor Technology
- Electrical Energy Technology
- Electronic Devices
- Signal Representation
- Stochastic Signals
- Communication Engineering
- Control Engineering 1
- Electromagnetic Field Theory
- Materials for Electrical Engineering
- Electives
- Bachelor Thesis (Conducted at TUM, Germany)

*Lab Coursework will be required in these modules

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This programme delivers competencies based on the 5 pillars of Electrical Engineering & Information Technology (Mathematics, Physics, Electrical Engineering, Information Technology and Signals & Systems), together with specialisations in Systems & Sensors and Integrated Circuit Design.

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**ELECTIVES**

**Integrated Circuit Design**
- Cryptology & IT-Security
- Signal Processing Systems
- Lab Course Analog Circuit Design
- Lab Course Digital Circuit Design

**Systems & Sensors**
- Micro System Technologies (MEMS Components)
- Real-Time and Embedded Systems
- Dynamic Systems & Control 2
- Control & Automation Laboratory

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**Articulated Diplomas**

The graduates of the following Polytechnic Diploma Programmes are eligible to apply for an exemption package up to 18 credits.

**Nanyang Polytechnic**
- Diploma in Biomedical Engineering / Electrical Engineering with Eco-Design / Electronics, Computer & Communications Engineering / Engineering Informatics / Information Technology / Cyber Security & Forensics (formerly known as Information Security) / Mechatronics Engineering / Multimedia & Infocomm Technology / Nanotechnology & Materials Science / Telematics & Media Technology

**Ngee Ann Polytechnic**

**Republic Polytechnic**

**Singapore Polytechnic**

**Temasek Polytechnic**
- Diploma in Aerospace Electronics / Biomedical Engineering / Biomedical Informatics & Engineering / Clean Energy / Computer Engineering / Electronics / Infocomm & Network Engineering / Microelectronics / Mechatronics / Media & Communication Technology / Telecommunications

*Other relevant diplomas not listed will be considered on a case-by-case basis.
COURSE OUTLINE

Year 1
- Calculus 1 & 2
- Linear Algebra
- Circuit Theory 1 & 2
- Digital Technology
- Algorithms and Data Structures
- Computer Technology
- Physics
- Electricity & Magnetism

Year 2 & Year 3
- Calculus 3
- Discrete/Numerical Mathematics (Choose either)
- Measurement & Sensor Technology
- Electrical Energy Technology
- Electronic Devices
- Signal Representation
- Stochastic Signals
- Communication Engineering
- Control Engineering 1
- Electromagnetic Field Theory
- Materials for Electrical Engineering
- Electives
- Cross Discipline Modules
- Bachelor Thesis (Conducted at TUM, Germany)
- Industrial Internship (Minimum of 8 weeks)

*Lab Coursework will be required in these modules

ELECTIVES

Integrated Circuit Design
- Cryptology & IT-Security
- Signal Processing Systems
- Lab Course Analog Circuit Design
- Lab Course Digital Circuit Design

Systems & Sensors
- Micro System Technologies (MEMS Components)
- Real-Time and Embedded Systems
- Dynamic Systems & Control 2
- Control & Automation Laboratory

UNDERGRADUATE DEGREE REQUIREMENTS (180 credits)


Advanced Modules (42 credits): Electives (30) + Bachelor Thesis (12)

Professional Qualifications (18 credits): Internship (12 credits) + Cross Discipline (6 credits)

DURATION
3 years (6 semesters)
CAREER PROSPECTS

WE BREAK THE RULES

Instead of only thinking about your career pathway after graduation, the German education system is designed to be industry relevant from the start.

You will have lecturers and professors with a strong industry background to introduce you to the needs & demands of the industry. Coupled with networking sessions and our close cooperation with internationally renowned companies, you will be a step ahead of your peers when graduation comes round.

Our experience with TUM graduates has been positive so far. The graduates come in with a good foundation and confidence to adapt quickly to their new job. TUM graduates are a good source of Engineering talent comparable with graduates from the top universities in Singapore.

Rohde & Schwarz Asia Pte Ltd

TUM achieved a score of 96.1 for “Employer Reputation” in the QS World Rankings 2013/2014.

Graduates from the programme will be able to find opportunities in the fields of Integrated Circuits, Electronics, Intelligent Energy Networks, Electromobility, Human Machine Interaction, Robotics, Media Technology, Communications Engineering & more.

For more information on Career Prospects in the Electronics sectors, do log onto www.tum-asia.edu.sg/prospects-after-graduation
As part of TUM Asia’s undergraduate degree requirements, every student will complete his/her Bachelor Thesis in the home campus of TUM after successfully completing his/her coursework. Each student will have the opportunity to spend three to six months living and studying in Munich, as part of the Overseas Immersion Programme (OIP) experience.
This experience is designed not only for the benefit of the student's academic learning, but also for the development of lifeskills. Living abroad & caring for oneself's needs will enable every student to pick up soft skills that will never be learnt in the classroom. Students will also pick up basic German for day-to-day living & learn the tact of assimilating into another culture - a key skill in today's globalized workforce.

The city of Munich, is home to two of the most elite universities in Europe. Munich attracts a strong number of international students each year as the city is safe and easily accessible by public transport (the trains run till 3am!). Munich is centrally located to the neighbouring countries such as Switzerland, Austria, France and Italy, which makes short leisure trips possible on weekends. Our professors have also commented that Singapore can be extremely similar to Munich - apart from the weather! Turn the page to find out more about what Munich has to offer you.
Munich is home for the annual Oktoberfest, a world-known beer festival which occurs for two weeks at the end of September. It also coincides with the time that students fly over for their Overseas Immersion Programme.

Munich’s most famous soccer team, FC Bayern München, is also the most successful club in German soccer history.

The Allianz Arena is also located in Munich and is widely known as the first stadium in the world with a full color-changing color exterior. Students will get the opportunity to watch their famous stars play some of the top teams in the world.

Entrepreneurship is highly respected in Munich. Start-up weekends are regularly held to allow individuals to develop innovative ideas with the help of professionals. TUM promotes the same entrepreneur spirit, and students are able to be immersed in this culture during their stay in Munich.

Munich, or München is the third largest city after Berlin and Hamburg, with a population of approximately 1.4 million people.
Undergraduate Programmes

INDUSTRIES
Reputable global companies such as BMW, Linde AG and Siemens are homegrown to Munich. Other well-known companies such as Rohde & Schwarz and TÜV SÜD have made Munich their company headquarters.

DEUTSCHES MUSEUM
Munich boasts the largest museum of Science & Technology in the world. It displays more than 28,000 objects in 50 exhibition areas.

STUDENT-FRIENDLY
Munich is a student-friendly city and is ranked top 10 in the QS world cities for students. Munich also has a very efficient public transport system, making it easy to travel around.

INTERNATIONAL
Munich is very international and it is easy to come across many Asian, Turkish eateries and supermarkets. The student suberb is an excellent place to find wallet friendly prices for students.
My thirst for knowledge has been fueled and empowered during my studies. Our professors may be experiencing jet-lag from their long flights from Germany, however they never fail to put in 101% for our classes. They recognize the value in every student and everyone has ample opportunities to clarify their doubts.

Though the curriculum is challenging, it has sharpened critical thinking skills and a strong theoretical foundation, which has prepared me to take on the challenges in the industry. Chemicals are a big part of our lives & I want to create a sustainable world through what I do.

Lee Poh Sein  
Manufacturing Engineer  
Baxalta Manufacturing SARL Singapore Branch  
BSc Chemical Engineering (Best Student, Class of 2014)

TUM is not only the #1 German University, but is also strongly connected with significant industry partners who are supportive of the quality and rigour of our academic curriculum. We are able to secure internship and career opportunities not only in Singapore, but also around the world with our TUM degree.

At TUM Asia, learning is not solely about understanding theoretical knowledge, but also knowing how to apply them. The hands-on experience during our thesis work in Germany, and the knowledge that I learnt at my internship has certainly prepared me well for a head start in my career.

Lim Wei Ting  
Software Engineer  
Continental Automotive Singapore Pte Ltd  
BSc Electrical Engineering & I.T. (Best Thesis, Class of 2014)

TUM has prepared me to be ready for the workforce. I like the teaching style which really grooms the students to be professional, critical, and assertive. Moreover, the system in TUM encouraged the students to work together and to have a strong interaction with the professors.

Andy Sutanto  
Process Engineer, Plastic Additives, Jurong Island  
BASF South East Asia Pte. Ltd.  
BSc Chemical Engineering
Joining TUM Asia was one of the best decisions of my life! As I am representing Singapore for volleyball, the flexible schedule allowed me to make time for school and travelling for team trainings. I was able to embrace the complete experience of university life.

Michelle Tan
Undergraduate, Bachelor of Science (Chemical Engineering)
Singapore Polytechnic

The most memorable time during my undergraduate studies was working on my Bachelor Thesis in Munich, Germany. Weekend trips to nearby cities such as Vienna and Berlin with my classmates were an added bonus! The experience exposed me to new technologies and perspectives, which contributed to my internship at Rohde and Schwarz Asia. My current job allows me to make practical applications of what I studied.

Benjamin Ng Zhi Wei
Undergraduate, Bachelor of Science (Electrical Engineering & Information Technology)
Catholic Junior College

Studying in TUM Asia was a unique learning experience for me. My peers in other universities often contacted tutors or teaching assistants as it was rare to interact with their professors due to their busy schedules. At TUM Asia, there were plenty of opportunities to communicate with my professors, be it during or after lectures. The pace of the lectures are catered to the learning of the class, which helped us to grasp new concepts better.

Teo Yin Song Gerald
Undergraduate, Bachelor of Science (Electrical Engineering & Information Technology)
Meridian Junior College

My academic journey has been a fruitful and truly international experience. Completing my Bachelor Thesis in a foreign country taught me to be adaptive, independent and self-motivating. I am proud that I took on the challenges to pursue engineering with a world-class university.

Goh Qi Yao
Undergraduate, Bachelor of Science (Chemical Engineering)
Singapore Polytechnic
ELECTROMOBILITY IN TROPICAL MEGACITIES

TUM is known for its research capabilities and strength in innovation. As such, TUM Asia spearheaded the set up of TUM CREATE as a base for research here in Singapore. TUM CREATE is a joint research programme between Technische Universität München (TUM) and Nanyang Technological University (NTU). It is part of the Campus for Research Excellence And Technological Enterprise (CREATE) programme funded by the National Research Foundation, an agency of the Prime Minister’s Office in Singapore.

The electromobility research institute brings together the expertise and knowledge of Germany and Singapore, to drive innovation to shape the future of sustainable mobility by tackling issues ranging from the molecules to the megacity.

Graduates from the TUM Asia undergraduate programmes have the opportunity to apply for positions at TUM CREATE, especially if your interest lies in research/electromobility.

We combine German expertise from TUM with Singapore’s existing knowledge in our cutting edge research at TUM CREATE. Our goal is to develop knowledge, build capacity and contribute to the local R&D landscape.

Professor Dr. Maria-Elisabeth MICHEL-BEYERLE
Chief Executive Officer, TUM Create

Merely after two years of research and development, TUM CREATE unveiled the electric taxi prototype EVA that was designed and built from the ground up. It features the technologies and innovations developed by their scientists and engineers. In 2015, EVA, the world’s first electric taxi for tropical megacities was launched.
How to apply

Applications for our undergraduate programmes are facilitated by Singapore Institute of Technology (SIT). You may apply online via SingaporeTech.edu.sg. Kindly refer to SIT’s website for tuition fees and other relevant admission criteria.

Contact us

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