



BACHELOR OF ENGINEERING WITH HONOURS in Chemical Engineering

Joint undergraduate programme by Singapore Institute of Technology (SIT)
and Technical University of Munich (TUM)



SINGAPORE INSTITUTE OF TECHNOLOGY

Singapore Institute of Technology (SIT) is Singapore's university of applied learning. SIT's vision is to be a leader in innovative learning by integrating learning, industry and community. Its mission is to nurture and develop individuals who build on their interests and talents to impact society in meaningful ways.

SIT offers applied degree programmes targeted at growth sectors of the economy with a unique pedagogy that integrates work and study. SIT's degree programmes feature a 6 to 12-month Integrated Work Study Programme (IWSP) which exemplifies the best of university-industry collaboration.

Since its establishment in 2009, SIT has grown from its inaugural batch of 500 students in 10 degree programmes to over 7,000 students in 42 degree programmes from across SIT and 9 overseas university partners. These degree programmes are grouped into five clusters – Engineering (ENG), Chemical Engineering and Food Technology (CEFT), Infocomm Technology (ICT), Health and Social Sciences (HSS), as well as Design and Specialised Businesses (DSB).

SIT also aims to cultivate in its students four distinctive traits, or the SIT-DNA, which will prepare them to be 'thinking tinkerers', who are 'able to learn, unlearn and relearn', be 'catalysts for transformation' and finally, become 'grounded in the community'.

www.singaporetech.edu.sg

TECHNICAL UNIVERSITY OF MUNICH

#1 Technical University in Germany



Rankings

#1
university

TUM is ranked as the #1 University in Germany*

#6
in employability

TUM ranked #6 in the Global Employability Survey[^]

17 Nobel Prize recipients

17 scientists & alumni of TUM have received the Nobel Prize

TOP 50
universities

TUM is ranked among the world's Top 50 Universities[#]

The Technical University of Munich (TUM) was founded in 1868 and is one of Europe's leading technical universities. Ever since its founding, TUM has been at the forefront of science and innovation, playing a vital role in Europe's technological advancement.

Acting as an entrepreneurial university that promotes talents and creates value for society, TUM has produced 17 Nobel Prize winners since 1927, most notably Ernst Otto Fischer (Chemistry) and Rudolf Mößbauer (Physics). In international rankings, TUM is regularly placed among the best universities in Germany, and is the only university to have won recognition as a German "Excellence University" in every round since 2006.

With this unwavering commitment, TUM Asia was set up in 2002 as the first academic venture abroad by a German university, bringing German academic excellence to Asia.

Offering Bachelor, Master courses and a series of executive education courses, TUM Asia strives to be on the front edge of change by

constantly scanning the industry landscapes in Asia, refining its approach on education to remain relevant to the industry. The TUM portion of the joint Bachelor degree with SIT is managed by TUM Asia, the Singapore campus of TUM.

TUM professors come from as far as Germany, and their wealth of knowledge from various fields provide a spectrum of experience for the students to glean from.

More than a thousand students have come through the doors of TUM Asia and now ply their trades in top research institutes and companies across the globe.

⁺ As rated by QS World Ranking 2015 -2019 and Academic Ranking of World Universities (Shanghai ranking) 2011 - 2013, 2016

[^] As ranked in the 2018 Global University Employability Ranking by Times Higher Education

[#] As rated by QS World Ranking 2018 and Academic Ranking of World Universities (Shanghai ranking) 2016 - 2018



TUM Asia

www.tum-asia.edu.sg | www.tum.de

ABOUT THE PROGRAMME








The Bachelor of Engineering with Honours in Chemical Engineering is a four-year degree programme jointly offered by Singapore Institute of Technology (SIT) and Technical University of Munich (TUM). This joint degree equips students with relevant Industry 4.0 skillsets to thrive in the local and global chemical industry. Co-developed by both universities, the programme will be taught by SIT and TUM faculty and commences in September each year.



Why this Programme?

The new joint programme will be the first and only course in Singapore to equip budding chemical engineers with relevant chemical Industry 4.0 skillsets, which aims to manufacture products through intelligent processes. These include digital value chain integration, seamless asset lifecycle management, and business-to-plant production control. Students in the additive manufacturing specialisation will learn 3D-printing design, formulation and engineering principles. This new programme thus trains future chemical engineers to integrate digital systems with smart or additive manufacturing seamlessly and effectively.

Transformation Map of the Energy & Chemicals Industry

	VISION & 2025 Target: Building a Competitive Energy & Chemicals Hub in the Global Market		Earn S\$12.7 billion in value-added revenue		Create 1,400 new jobs		
	SPECIALTY CHEMICALS		PETROCHEMICALS		CRACKERS		REFINERIES
Across end markets: Consumer, Oilfield & Water, AgroChem, Animal Nutrition & Lube Additives		Extensive range of petrochemicals: Polyolefins, Oxo-chemicals & Elastomers		4 million tonnes of ethylene per annum		1.3 million barrels per day	

	TRANSFORM	EXPAND & DIVERSIFY
	<ul style="list-style-type: none"> • Revolutionise existing base through the adoption of innovative technologies • Zero in on at least 20 plants, including all crackers & refineries to adopt Advanced Manufacturing technologies by 2020 • Advance productivity, rejuvenate assets & optimise resources through the adoption of digital technologies & automation 	<ul style="list-style-type: none"> • Expand & grow innovation capabilities to help companies speed up innovation cycles & advance capabilities • Focus on at least 20 expanded or new application development centres by 2023 with an increase of \$55 million in business expenditure on R&D • Upgrade & diversify product slate towards high value-added specialty chemicals & petrochemicals
	CREATING GOOD JOBS FOR SINGAPOREANS	CHAMBERS & TRADE ASSOCIATIONS AS PRIMARY PARTNERS
	Bring government initiatives & programmes to help Singaporeans over the course of their career, such as Earn & Learn, Professional Conversion Programmes & Skills Framework	To further develop the industry, encourage closer collaborations with the Association of Process Industry (ASPRI) & Singapore Chemical Industry Council (SCIC)

THE PLAN

PROGRAMME & CURRICULUM STRUCTURE



Trimester 1 Sep - Dec

Trimester 2 Jan - Apr

Trimester 3 May - Aug

YEAR 01

Fundamentals

- Physics
- Advanced Mathematics 1
- General & Inorganic Chemistry
- CAD & Technical Drawing
- Biomolecular Science

Fundamentals

- Advanced Mathematics 2
- Analytical Chemistry & Advanced Inorganic Chemistry
- Analytical Chemistry & Advanced Inorganic Chemistry Lab Course
- Chemistry Thermodynamics
- Organic Chemistry

Break + Fundamentals

- Instrumentation
- Information Technology 1
- Technical Communication*

YEAR 02

Fundamentals & Core

- Chemical Engineering Principles
- Heat Transfer Phenomena
- Organic Chemistry Lab Course
- Engineering Mechanics
- Change Management*

Fundamentals & Core

- Chemical Reaction Engineering & Catalysis
- Material Science & Engineering
- Information Technology 2
- Engineering Thermodynamics
- Basic German*

Break + OIP & Core

- Overseas Immersion Programme (OIP)
- Chemical Engineering Lab Course 1 & 2
- Mechanical Process Engineering
- Thermal Process Engineering

YEAR 03

Core

- Sustainable Energy Systems
- Process Safety
- Biochemical Process Engineering
- Fluid Mechanics
- Career & Professional Development Module

Specialisation

- Process Control
- Plant Design 1
- Internet of Things or Basics in Polymer Engineering
- Industrial Automation or Polymers & Polymer Technology
- Project Management & Engineering Ethics

Specialisation

- Plant Design 2
- Data Processing & Analytics or Material & Failure Analysis
- Industrial Software Engineering or 3D Printing
- Practical Course in Industrial Automation or Practical Course in Additive Manufacturing
- IP & Technopreneurship or Operational Excellence*

YEAR 04

IWSP + Bachelor Thesis

- Integrated Work Study Programme (IWSP)
- Bachelor Thesis

IWSP + Bachelor Thesis

- Integrated Work Study Programme (IWSP)
- Bachelor Thesis



Integrated Work Study Programme (IWSP)

The Integrated Work Study Programme (IWSP) allows students to work full-time in a host company for eight months, blending theory and practice to obtain valuable industrial know-how.

Students will have the opportunity to work with local or overseas companies that offer exposure to relevant fields such as chemistry, process, products, automation, and data analysis.



Overseas Immersion Programme (OIP)

The three-week Overseas Immersion Programme (OIP) in Germany aims to widen students' global outlook as they undertake projects in Germany to develop their interpersonal and technical skills, while exposing them to current industry challenges. Students may visit the main TUM campus, experience cross-cultural exchanges with German faculty and students, and learn industry best practices through educational site visits.



Programme Highlights

- German engineering with Asian relevance
- Broad-based Chemical Engineering Curriculum with I4.0 Topics
- Applications of Data Engineering and Additive Manufacturing
- Unique SIT - TUM Partnership
- 8-month Integrated Work Study Programme (IWSP)
- 3-week Overseas Immersion Programme (OIP) in Germany
- Professional Degree to be accredited by EAB Singapore

ADMISSION CRITERIA



FOR POLYTECHNIC DIPLOMA HOLDERS

Diploma holders from any of the five local polytechnics are welcome to apply.

FOR GCE 'A' LEVELS HOLDERS & INTERNATIONAL STUDENTS

Applicants who graduate with GCE 'A' Levels qualifications are eligible to apply for the Chemical Engineering degree programme. Students with other qualifications (completed a formal 12-year education equivalent to A-Levels) are eligible to apply as well.

How to Apply

Apply from January - March each year. For more details, visit www.singaporetech.edu.sg.

Career Opportunities



Process Engineer



Manufacturing Engineer



Validation Engineer



Safety Engineer



Research Scientist



Materials Scientist