BACHELOR OF ENGINEERING WITH HONOURS

in Electronics & Data 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

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.

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#

+ *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 Electronics and Data Engineering is a four-year degree programme jointly offered by SIT and Technical University of Munich (TUM). Combining electronics and data engineering, this programme is aimed to equip students with the necessary skills and competencies in the emerging digital workforce.

Graduates from this programme will be equipped with deep knowledge in semiconductor physics and circuit design, along with intensive mathematics for data science and machine learning. Leveraging on TUM's expertise in areas such as Semiconductor Physics, Circuit Design and Sensors and Power Electronics, students can apply emerging digital technologies set to revolutionise the electronics and semiconductor manufacturing industry.
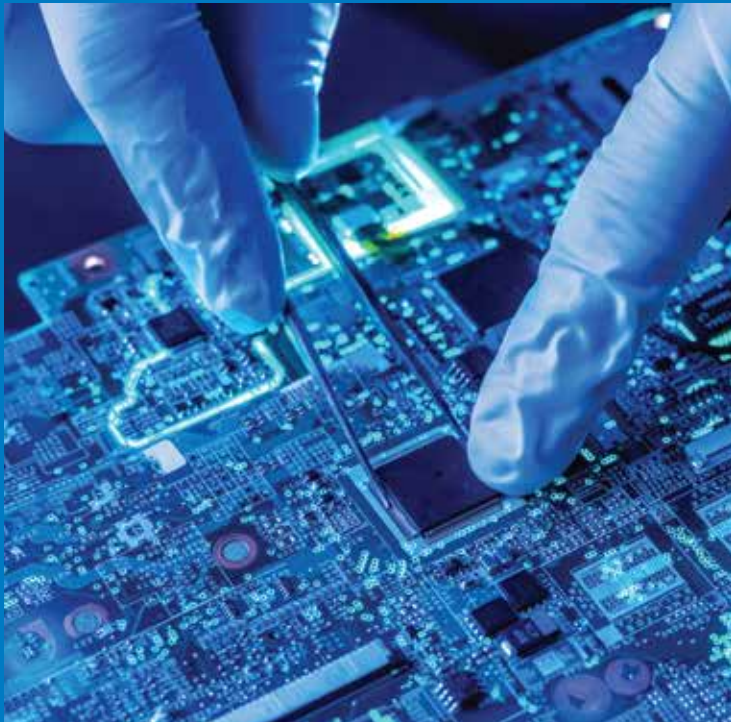
Why this Programme?

The Electronics Industry Transformation Map (ITM) launched by Ministry for Trade and Industry in 2017 identifies the electronics industry as a key sector of continual growth for Singapore's economy. Graduates proficient in Artificial Intelligence (AI), Internet of Things (IoT), data analytics, robotics, and automation are especially sought after to meet emerging demands.

Developed in response to the growing demands of the Singapore and global electronics industry, the unique programme combines electronics and data engineering concepts to equip students with the necessary skillsets for the digital workforce. Students will be equipped with the fundamentals of electronics and emerging technologies to revolutionise electronics manufacturing operations. Some examples of the emerging technologies covered in the syllabus include AI, IoT, data analytics, robotics and automation.

Electronics Industry Transformation Map

Vision
– Building the Electronics Industry of the Future

2020 Target
– $22.2 Billion Manufacturing Value-Add
– Generate 2,100 jobs (Professional, Managerial, Executive & Technical)

The Plan
– TRANSFORM & EXPAND
• Advance productivity through the adoption of automation & robotics
• Encourage companies to undertake advanced manufacturing innovation
• Engage & keep high value-added manufacturing activities

– DIVERSIFY
Enhance the innovation ecosystem to harness new growth opportunities
• Set Singapore as an innovation hub for new solutions & products
• Expand into new growth markets such as healthcare & urban mobility

PROGRAMME & CURRICULUM STRUCTURE

	Trimester 1 Sep - Dec	**Trimester 2** Jan - Apr	**Trimester 3** May - Aug
YEAR 01	**Fundamentals** • Engineering Mathematics 1 • Programming • Engineering Physics • Digital Electronics • Engineering Mathematics 2	**Fundamentals** • Circuit Theory • Discrete Mathematics • Data Structures & Algorithms • Electricity & Magnetism • Analogue Electronics	**Break + Fundamentals** • Engineering Mathematics 3 • Circuit Design Fundamentals • Technical Communication*
YEAR 02	**Fundamentals & Core** • Engineering Mathematics 4 • Object Oriented Programming • Semiconductor Physics • Database & Information System • Control Engineering • Change Management*	**Fundamentals & Core** • Digital Signal Processing • Probability & Statistical Signal Processing • Sensor Electronics • Power Electronics • Real-Time & Embedded Systems • Basic German*	**Break + OIP & Core** • Overseas Immersion Programme (OIP) • Digital Filters System Theory • Introduction to IT Security
YEAR 03	**Core** • Data Analytics • Machine Learning • Semiconductor Devices • Internet of Things • Group Design Project • Career & Professional Development*	**Specialisation** • Automation & Robotics • Industrial Electronics* • Semiconductor Fabrication* • Bioelectronics* • Digital Communications* • Project Management & Engineering Ethics*	**Specialisation** • RF Electronics* • Semiconductor Device Reliability* • Reliability of Learning Systems* • Manufacturing Management* • 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	

* Elective Modules

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 circuits, systems, products experimentation, data analysis and simulation.

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

- Gain necessary skillsets and competencies for the emerging digital workforce
- Acquire deep knowledge in semiconductor physics and circuit design
- 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 Electronics & Data Engineering degree programme. Students with other qualifications (completed a formal 12-year education equivalent to A-Levels) are eligible to apply as well.
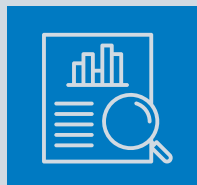
How to Apply

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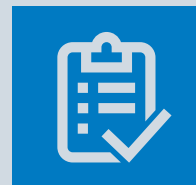
Career Opportunities

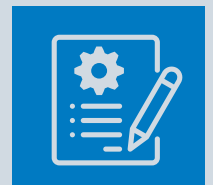Electrical & Electronics Engineer

Data Engineer

Process Engineer

IC Production & Test Engineer

Application Engineer