CHEMICAL ENGINEERING AND FOOD TECHNOLOGY
Singapore Institute of Technology (SIT) is Singapore’s University of Applied Learning. With a mission to nurture and develop individuals who impact society in meaningful ways, SIT aims to be a leader in innovative learning by integrating learning, industry, and community.

SIT offers applied degree programmes targeted at growth sectors of the economy with a unique pedagogy that integrates work and study. Applied research is weaved into students’ learning experiences, where they work on real industry problems and create solutions to meet industry needs.

As part of the university’s advocacy for the work-learn continuum, SIT strives to instil within its students a culture of lifelong learning and places an emphasis on skills needed by industry. SIT also aims to cultivate in its students four distinctive traits that form the SIT-DNA: Thinking Tinkerers; Able to Learn, Unlearn and Relearn; Catalysts for Transformation; and Grounded in the Community.
WHY PURSUE CHEMICAL ENGINEERING AND FOOD TECHNOLOGY

KEY PILLARS IN SINGAPORE’S ECONOMY

The chemical, energy, pharmaceutical, and food sectors form the key pillars of the Singapore economy. There is a great demand for well-trained graduates with the expertise to solve complex interdisciplinary problems in the chemical, energy, pharmaceutical, and food industries.

OUR APPLIED LEARNING PEDAGOGY

Through the seven- to eight-month Integrated Work Study Programme (IWSP), students will get to contextualise their learning from the classroom in the industry and integrate theoretical knowledge with industry-relevant skills.

SPECIALISED TRAINING

At SIT, we offer programmes in Chemical Engineering, Pharmaceutical Engineering and Food Technology, where we scaffold specialist training onto fundamental grounding to endow our students with practical knowledge that is built on the rudiments of the discipline.

INDUSTRY-CENTRIC

Our unique pedagogy, coupled with an industry-centric curriculum, will give our students a competitive edge in the job market. They can apply their integrated knowledge in science, technology, and engineering to develop and improve products and processes in a sustainable way, without compromising the environment or safety.

MEANINGFUL CAREER PROSPECTS

By developing a range of specialist and transferable skills, graduates can look forward to careers that will contribute towards the sustainable production of chemicals, pharmaceuticals, and food. They will also address energy and food security challenges, and develop innovative solutions and new products that will meet today’s challenges and tomorrow’s needs.
My passion for science and food is what motivated me to pursue a Diploma in Applied Food Science and Nutrition. Although I did not perform well academically, my interest in food science did not falter. I went on to pursue an Advanced Diploma in Applied Food Science under the SkillsFuture Earn-and-Learn Programme (ELP) and was attached to Tate and Lyle Asia Pacific as a food technologist. After working for three years, I realised the need to deepen my technical skills and knowledge in understanding how a complex food system works. SIT’s applied learning approach caught my eye as I learn better through experiential learning, where I can apply what I have learnt in class to industry work scenarios. Initially, I was fearful of not being able to adapt to university life. That fear soon faded away when I realised that some of my peers had also chosen to work before pursuing their degree. In class, we look out for one another and unreservedly share our knowledge and experiences, making my learning journey truly meaningful.

FONG JIA WEI, CASSANDRA
Year 3
Food Technology

Scan the QR code to find out more.
During my polytechnic days, I took a module on ‘Good Manufacturing Practices’, which gave me a glimpse into how pharmaceutical products were manufactured. This inspired me to pursue Pharmaceutical Engineering as it fit my criteria of working hands-on, whilst being able to help others through the creation of pharmaceutical drugs. The programme syllabus is closely related to the operations of the pharmaceutical manufacturing plant, enabling me to assimilate seamlessly into the workforce. As a manufacturing associate, I am responsible for the running of the company’s plant, where we develop life-changing medicine, such as Prolia and XGEVA, a human monoclonal antibody for the treatment of osteoporosis and skeletal-related events due to multiple myeloma.

LIM XUN XIANG BRYAN
Graduate (2019)
Pharmaceutical Engineering
Manufacturing Associate I
Amgen Singapore Manufacturing Pte Ltd

Scan the QR code to find out more.
HEAR WHAT THE INDUSTRY SAYS

In the past two years, I have supervised four SIT IWSP students from both Pharmaceutical and Chemical Engineering programmes. They are excellent and have exceeded my expectations in a lot of areas, such as their mature attitude towards job assignments and teamwork, their capability in learning and applying new knowledge within a short period of time, and their innovative skills in solving practical challenges in projects. My sincere thanks to SIT for training and preparing the students well for the industry.

MR CHEN ZHENKANG
Head of Industrial Services
TÜV Rheinland Singapore Pte Ltd

As an industrial adjunct faculty, I found that SIT students perform well in my operational excellence class. We certainly look forward to seeing them apply their knowledge during their IWSP to improve industry processes.

MR SANKAR DHARMARAJ
Head PMO and Site Operation Excellence
Novartis Pharmaceuticals

Partnering with SIT offers collaborators access to students who are enthusiastic and have a specific interest in Pharmaceutical Engineering. This is beneficial for industry partners as the students have a good understanding of the processes used in the industry, and some practical experience in using relevant equipment and technology. SIT’s IWSP has provided us with the opportunity to train students and identify future employees for the company. As the students have already spent time working in the company, they are familiar with the environment and the processes, which will enable a smooth transition without additional training required.

DR ANDY T KUSUMO
Director of Science and Technology
Monde Nissin Singapore Pte Ltd

We have employed six SIT graduates since 2015. These young engineers exhibit strong technical competency and good problem-solving skills. We are glad to have them contributing their knowledge and skills for the progress and growth of our company.

MS NG MEE LIN
Manager
PP Manufacturing/HSE, Tech Coordination
The Polyolefin Company (S) Pte Ltd

Since 2017, we have partnered and collaborated closely with SIT’s Food Technology programme. The quality of the faculty and programme is reflected through the impactful performance that SIT interns and graduates have constantly displayed in KH Roberts. Independence, applied competence and possessing a result-oriented mindset are qualities that we have observed in SIT students and graduates. We value these qualities and trust that SIT graduates will be the transformational talents of tomorrow in the industry.

DR PETER KC ONG
Chief Executive Officer
KH Roberts

I have hired five SIT graduates in my team as field service engineers over the past five years. They are eager to learn, hardworking, team players, independent and possess great leadership skills. Their polytechnic background has enhanced their ability to be hands-on, which is very important in our industry. The first two graduates that I have hired are currently taking on heavy responsibilities in the team and contributing to the company. The younger engineers are also showing good performance and potential. Overall, my experience with SIT graduates has been very positive and I would certainly recommend others to consider hiring them.

MR LAWRENCE YEO
Lead Service Resource Manager
Water and Process Technologies
SUEZ — Water Technologies and Solutions

CHEMICAL ENGINEERING AND FOOD TECHNOLOGY
CHEMICAL ENGINEERING

PROGRAMME INFORMATION

Degree Programmes
- BEng Chemical Engineering — Jointly offered by SIT and Newcastle University
- MSc Chemical Engineering — Solely offered by SIT

Campus Locations
- SIT@Dover
- SIT@NP Building

Eligibility
- Polytechnic Diploma Holders
- A Level/IB Diploma/NUS High School Diploma Holders
- Other Year 12 Equivalent Qualification Holders

Visit SingaporeTech.edu.sg for the list of relevant qualifications.

PROGRAMME HIGHLIGHTS

- **GAIN WORK EXPERIENCE WHILE STUDYING** through the 26-week Integrated Work Study Programme (IWSP)
- **GET OVERSEAS EXPOSURE** through the three-week Overseas Immersion Programme (OIP) at Newcastle University
- **PRACTICAL BIAS** and the Use of Computational Tools

The SIT and Newcastle University (NU) joint degree programme in Chemical Engineering aims to produce graduates with a clear understanding of Chemical Engineering, combining a sound theoretical grasp of the subject with practical experience, and an awareness of their responsibility to society and the environment. Consisting of key, traditional Chemical Engineering topics, such as Transfer Processes and Unit Operations, Reactor Engineering, Process Control, as well as contemporary and globally important subjects, such as Sustainable Design and Clean Technology, students will learn how to critically analyse real-world process engineering problems with computational tools used by practising chemical engineers.

Assessment will be based on several components such as coursework, laboratory practice, and written examinations. Students will have the opportunity to creatively apply what they have learnt to solve challenges posed in their final-year capstone project on plant design. The academic training and soft skills acquired through the programme will produce capable graduates for the chemical and process industries. Graduates may also eventually choose to pursue industrial research to develop new solutions and innovative processes, or a postgraduate route to an academic career.

Graduates of this programme with good academic results and relevant work experience may also pursue the MSc Chemical Engineering, offered by SIT.

Note: This undergraduate programme will be admitting its last intake in AY2021/22.

1 This is a direct honours degree programme, subject to students meeting academic requirements.
# CHEMICAL ENGINEERING

## CURRICULUM STRUCTURE

### YEAR 1

<table>
<thead>
<tr>
<th>TRIMESTER</th>
<th>Courses</th>
</tr>
</thead>
</table>
| 1         | Engineering Mathematics 1  
|           | Statistics  
|           | Mass and Energy Balance  
|           | Biomolecular Science  
|           | Technical Writing and Effective Communication |
| 2         | Engineering Mathematics 2  
|           | Organic Chemistry  
|           | Organic Chemistry Laboratory  
|           | Computing and Simulation  
|           | Career and Professional Development |
| 3         | Break |

### YEAR 2

<table>
<thead>
<tr>
<th>TRIMESTER</th>
<th>Courses</th>
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</table>
| 1         | Heat and Mass Transfer  
|           | Reactor Engineering 1  
|           | Separation Processes 1  
|           | Thermodynamics  
|           | Engineering Practice |
| 2         | Engineering Practice (Lab)  
|           | Process Measurement, Dynamics and Control  
|           | Process Safety  
|           | Reactor Engineering 2  
|           | Separation Processes 2 |
| 3         | Fluid Mechanics  
|           | Sustainable Industry, Design and Manufacture  
|           | Overseas Immersion Programme  
|           | Integrated Work Study Programme |

Note: This undergraduate programme will be admitting its last intake in AY2021/22.
Chemical Engineering

Curriculum Structure

Year 3

1st Trimester
- Integrated Work Study Programme

2nd Trimester
- Integrated Work Study Programme
- Renewable Energy Tech and Clean Tech Applications
- Process Design, Economics and Project Management
- Chemical Process Optimisation
- Solids Handling
- Plant Design

3rd Trimester
- Process Control 2
- Chemical Process Optimisation
- Plant Design

Year 4

1st Trimester
- Core
  - Advanced Mathematical Methods in Chemical Engineering
  - Advanced Thermodynamics
  - Elective 1

2nd Trimester
- Core
  - Advanced Process Control
  - Advanced Reaction Engineering
  - Elective 2
  - Elective 3

3rd Trimester
- Specialisation
  - Advanced Separation Processes
  - Advanced Transport Phenomena
  - Elective 4

Note: This undergraduate programme will be admitting its last intake in AY2021/22.

^ The MSc Chemical Engineering is solely awarded by SIT.
WHAT TO EXPECT

Each five-credit module will involve about 36 hours of lectures/tutorials over 12 weeks of classes. In tutorials, students will discuss ideas in depth with experienced faculty members and guest lecturers from the industry. Students will be expected to spend a considerable amount of time in developing their own understanding of the topics covered in lectures, answering questions designed to check their understanding, and preparing for tutorials, assignments and assessments. As the programme progresses, they will also work in small teams of up to six people on more specialised topics for projects.

In the second and third year, students will undertake a 26-week Integrated Work Study Programme with a company. They will also be going for a three-week Overseas Immersion Programme at Newcastle University, UK. In the final year, students will be expected to work on their capstone project, based on a current industry problem with their team members.

CAREER OPPORTUNITIES

Graduates can look forward to working in, but not limited to, the following occupational fields:

- Oil and Gas Processing
- Fine Chemicals
- Petrochemicals
- Waste and Water Management
- Pharmaceutical Manufacturing
- Biotechnology/Biopharmaceutical

Note: This undergraduate programme will be admitting its last intake in AY2021/22.

The Chemical Engineering programme offered by SIT and Newcastle University shares the same Industry Advisory Committee members as the Pharmaceutical Engineering programme. Please refer to Page 22 of this booklet.
The SIT and Technical University of Munich (TUM) joint degree programme in Chemical Engineering is the first in Singapore to be imbued with Industry 4.0 topics relevant to the current and future needs of the chemical industry. This four-year degree programme aims to address the growing manpower demands of the local and global chemical industry by equipping students with deep skills in data engineering and additive manufacturing through intensive laboratory experiments and analysis.

Upon graduation, students will be globally-ready and competent hands-on chemical engineers with data engineering or additive manufacturing capabilities. They will be employable in companies in the general and specialty chemicals, pharmaceutical, petrochemical, environmental industries, research, as well as government agencies. They may also choose to continue pursuing postgraduate research and academia.

**PROGRAMME INFORMATION**

**Degree Programme**

- BEng Chemical Engineering¹

**Campus Location**

- SIT@Dover

**Eligibility**

- Polytechnic Diploma Holders
- A Level/IB Diploma/NUS High School Diploma Holders
- Other Year 12 Equivalent Qualification Holders

Visit [SingaporeTech.edu.sg](https://www.SingaporeTech.edu.sg) for the list of relevant qualifications.

**PROGRAMME HIGHLIGHTS**

- **GAIN RELEVANT WORK EXPERIENCE** through the eight-month Integrated Work Study Programme (IWSP)

- **GET OVERSEAS EXPOSURE** through the three-week Overseas Immersion Programme (OIP) at TUM

- Option to **SPECIALISE IN DATA ENGINEERING OR ADDITIVE MANUFACTURING** in the third year of studies

- Emphasis on **INDUSTRY 4.0 TOPICS, SYSTEMS WITH ANALYTICAL AND VISUALISATION CAPABILITIES**, that enable integration of predictive manufacturing and technical problem-solving with process design, alongside hazard analysis, environmental impact mitigation, as well as energy efficiency and safety

¹ This is a direct honours degree programme, subject to students meeting academic requirements.
## CHEMICAL ENGINEERING CURRICULUM STRUCTURE

### YEAR 1

<table>
<thead>
<tr>
<th>TRIMESTER</th>
<th>Courses</th>
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<tbody>
<tr>
<td>1</td>
<td>Physics</td>
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<td></td>
<td>Mathematics 1</td>
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<tr>
<td></td>
<td>Introduction to General and Inorganic Chemistry</td>
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<td></td>
<td>CAD and Technical Drawing</td>
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<tr>
<td></td>
<td>Biomolecular Science</td>
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<tr>
<td>2</td>
<td>Mathematics 2</td>
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<tr>
<td></td>
<td>Analytical Chemistry and Inorganic Chemistry</td>
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<td></td>
<td>Analytical Chemistry and Inorganic Chemistry Lab Course</td>
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<td></td>
<td>Chemical Thermodynamics</td>
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<td></td>
<td>Organic Chemistry</td>
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<tr>
<td>3</td>
<td>Break</td>
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<tr>
<td></td>
<td>Instrumentation</td>
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<tr>
<td></td>
<td>Information Technology 1</td>
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<td></td>
<td>Technical Communication</td>
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### YEAR 2

<table>
<thead>
<tr>
<th>TRIMESTER</th>
<th>Courses</th>
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<tbody>
<tr>
<td>1</td>
<td>Chemical Engineering Principles</td>
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<tr>
<td></td>
<td>Fluid Mechanics</td>
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<td></td>
<td>Organic Chemistry Lab Course</td>
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<td></td>
<td>Engineering Mechanics</td>
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<td></td>
<td>Change Management</td>
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<tr>
<td>2</td>
<td>Chemical Reaction Engineering and Catalysis</td>
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<tr>
<td></td>
<td>Heat Transfer Phenomena</td>
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<td></td>
<td>Information Technology 2</td>
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<tr>
<td></td>
<td>Engineering Thermodynamics</td>
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<td></td>
<td>Basic German (Elective)</td>
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<tr>
<td>3</td>
<td>Break</td>
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<tr>
<td></td>
<td>Overseas Immersion Programme</td>
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<tr>
<td></td>
<td>Chemical Engineering Lab Course 1 and 2</td>
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<tr>
<td></td>
<td>Mechanical Process Engineering</td>
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<td></td>
<td>Thermal Process Engineering</td>
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</tbody>
</table>
## CHEMICAL ENGINEERING

### CURRICULUM STRUCTURE

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<thead>
<tr>
<th>YEAR</th>
<th>TRIMESTER</th>
<th>Courses</th>
</tr>
</thead>
</table>
| 3    | 1         | - Sustainable Energy Systems  
- Process Safety  
- Biochemical Process Engineering  
- Materials Science and Engineering  
- Career and Professional Development |
|      | 2         | - Process Control  
- Plant Design 1  
- Internet of Things or Basics in Polymer Engineering  
- Industrial Automation or Polymers and Polymer Technology  
- Project Management and Engineering Ethics |
|      | 3         | - Plant Design 2  
- Data Processing and Analytics or Materials and Failure Analysis  
- Industrial Software Engineering or 3D Printing  
- Practical Course in Industrial Automation or Practical Course in Additive Manufacturing  
- IP and Technopreneurship or Operational Excellence (Elective) |
| 4    | 1         | - Integrated Work Study Programme  
- Thesis |
|      | 2         | - Integrated Work Study Programme  
- Thesis |
WHAT TO EXPECT

During the first year of the programme, students will divide their time between lectures and tutorials each week, in addition to practical/laboratory sessions. In tutorials, students will discuss ideas in depth with experienced faculty members and guest lecturers from the industry. They will be expected to spend a considerable amount of time developing their own understanding of the topics covered in lectures, answering questions designed to check their understanding, and preparing for tutorials. As the programme progresses, students will also work in small teams of up to six people on more specialised topics for projects.

In the second year, students will go for a three-week Overseas Immersion Programme at the TUM campus. In the final year, they will undertake an Integrated Work Study Programme with a company for up to eight months and work on their bachelor thesis, based on a current industry problem.

CAREER OPPORTUNITIES

Graduates can look forward to working in, but not limited to, the following occupational fields:

- Process Engineer
- Manufacturing Engineer
- Validation Engineer
- Safety Engineer
- Research Scientist
- Materials Scientist
The Food Technology joint degree programme with honours, offered by SIT and Massey University, provides a curriculum focused on Food Product Technology, combining food science, food engineering, and food business. The programme educates and equips students with the fundamentals of food science and applied food technology skills required for a global career in the food industry. Apart from lectures and tutorials, there will be practical laboratory and workshop sessions, where students are taught fundamental techniques and also how to troubleshoot and solve technical issues in the food industry. Students will obtain hands-on experience in food processing plants under the mentorship of highly qualified lecturers, who have valuable work experience in the food industry.

With the growing worldwide focus on health and well-being, there is an increasing consumer demand for healthy and safe food products. Food Technologists have an important role to play in the development and manufacturing of these food products. Graduates are sought after by multinational corporations, as well as small and medium enterprises, for their technical expertise.

PROGRAMME INFORMATION

Degree Programme
- B Food Technology

Campus Location
- SIT@Dover

Eligibility
- Polytechnic Diploma Holders
- A Level/IB Diploma/NUS High School Diploma Holders
- Other Year 12 Equivalent Qualification Holders

Visit SingaporeTech.edu.sg for the list of relevant qualifications.

PROGRAMME HIGHLIGHTS

- PRACTISE FOOD TECHNOLOGY from Day One
- INTEGRATED CURRICULUM OF SCIENCE, TECHNOLOGY AND BUSINESS
- GAIN WORK EXPERIENCE WHILE STUDYING through the 28-week Integrated Work Study Programme (IWSP)
- Learn through PROBLEM-SOLVING
- Approach Food Technology with a BUSINESS AND MANAGEMENT FOCUS
- Undergo the OVERSEAS IMMERSION PROGRAMME (OIP) at Massey University

1 This is a direct honours degree programme, subject to students meeting academic requirements.
FOOD TECHNOLOGY

CURRICULUM STRUCTURE

YEAR 1

1 TRIMESTER

Fundamentals 1
- Chemistry for Food Technology
- Biochemistry
- Mass and Energy Balance
- Food Technology 1 and 2: Global and Creative Solutions
- Engineering Mathematics 1

2 TRIMESTER

Fundamentals 2
- Engineering Fundamentals (Mechanics and Electricity)
- Food Technology 3: Product Development
- Programming for Engineering
- Industrial Microbiology
- Break

3 TRIMESTER

YEAR 2

1 TRIMESTER

Core 1
- Chemical Energetics
- Molecules to Materials
- Technical Writing and Communication
- Heat and Mass — Conservation and Transfer
- Fluid Flow and Particle Technology

2 TRIMESTER

Core 2
- Food Technology 4: Manufacturing
- Food Technology 5: Food Microbiology and Safety
- Food Chemistry
- Career and Professional Development
- Engineering Mathematics 2

3 TRIMESTER

Specialisation 1
- Food Technology 6: Food Characterisation
- Food Formulation Technology
- Nutrition and Food Choice
- Statistical Modelling for Engineers and Technologists
FOOD TECHNOLOGY

CURRICULUM STRUCTURE

YEAR 3

TRIMESTER 1

Specialisation 2
- Food Packaging Engineering and Legislation
- Industrial Systems Improvement
- Process Engineering Operations
- Reaction Technology and Process Modelling

TRIMESTER 2

- Integrated Work Study Programme

TRIMESTER 3

- Integrated Work Study Programme

YEAR 4

TRIMESTER 1

Development and Management
- Food Technology Project
- Prescribed Elective (Students to choose one):
  - Added-Value Processing of Food Products*
  - International Food Production Systems*
  - Crystallisation in Foods^*
  - Food Law and Regulations^*
  - Conventional and Emerging Food Processing Technologies^*

TRIMESTER 2

Development and Management
- Advanced Food Technology
- Innovative Food Design and Development

* Students will complete this module in Massey University.
^ Students will complete this module in SIT.
WHAT TO EXPECT

During the first two years of the programme, students will build their fundamental and core knowledge in Food Technology through lectures, tutorials and practical sessions. During these trimesters, they are expected to have up to 17 hours of lectures and tutorials and up to nine hours of practical sessions per week. For most modules, students are expected to work on individual assignments, as well as group projects.

In the third year, students will take on specialisation modules and fulfil a 28-week Integrated Work Study Programme with a company in the food industry. In the final year, they will complete three compulsory Development and Management modules and one elective module. For ‘Food Technology Project’, students can opt to complete their capstone project over a 15-week duration, either at Massey University in New Zealand, or locally at SIT. In the ‘Innovative Food Design and Development’ module, students will work in groups on another capstone project to design and develop a food product for a company.

CAREER OPPORTUNITIES

Graduates can look forward to working in, but not limited to, the following occupational fields:

- Quality Control and Assurance
- Food Manufacturing
- Food Microbiology and Safety
- Sensory, Nutrition and Regulatory
- Product Development
- Research

INDUSTRY ADVISORY COMMITTEE

The members of the Industry Advisory Committee for this programme are:

**MR PHILIP HO**
Commercial Lead Asia Pacific
Tereos Asia Pte Ltd

**MR LEE KIOW SENG**
Director
Seagift Food Pte Ltd

**DR ALLAN LIM**
Group Manager
Front End Innovation and Partnerships
Nestlé R&D Center (Pte) Ltd

**DR PETER ONG**
Chief Executive Officer
KH Roberts Pte Ltd

**DR SAW LIN KIAT**
Chief Executive Officer
Faesol
Built on an interdisciplinary curriculum that intersects engineering, life sciences and chemistry, the Pharmaceutical Engineering (PharmE) programme aims to deliver a rigorous education with a strong industry focus. The goal of this programme is to produce graduates who are both theoretically-grounded and practice-oriented for the knowledge-intensive pharmaceutical industry and related sectors.

Distinguished by a curriculum that is strongly girded with cutting-edge, industry-compliant concepts and know-how, students will be trained in core competencies in the development and manufacturing of the two largest classes of pharmaceutical drugs — (i) biologics and (ii) small molecule drugs (SMD). The curriculum’s strong grounding in both engineering and science will strengthen the programme’s foundation, upon which students will be trained in the full spectrum of skill sets pertinent to drug manufacturing. This ranges from drug development and production to process development, operations, validation, regulation and compliance.

Modules to develop students’ business and management acumen will also be offered to add breadth to the technical specialisation of the programme, allowing them to gain an understanding of the expectations in commercial environments and productivity management. The translational nature of the curriculum will allow students to readily apply their science and engineering knowledge to the highly advanced and regulated pharmaceutical manufacturing environment, thus grooming graduates who can make impactful contributions to industry.
## CURRICULUM STRUCTURE

### YEAR 1

#### TRIMESTER 1
- **Fundamentals**
  - Engineering Mathematics 1
  - Chemistry
  - Statistics
  - Mass and Energy Balance
  - Biomolecular Science 1

#### TRIMESTER 2
- **Core 1**
  - Engineering Mathematics 2
  - Organic Chemistry
  - Organic Chemistry Lab
  - Programming for Pharmaceutical Engineering
  - Engineering Principles 1 (Heat and Mass Transfer)

#### TRIMESTER 3
- **Core 2**
  - Engineering Mathematics 3
  - Engineering Thermodynamics
  - Engineering Principles Lab
  - Biomolecular Science 2
  - Engineering Principles 2 (Fluid Mechanics)
  - Career and Professional Development 1

### YEAR 2

#### TRIMESTER 1
- **Core 3**
  - Operational Excellence
  - Current Good Manufacturing Practices
  - Technical Writing and Communication
  - Engineering Principles 3 (Reaction Engineering)
  - Career and Professional Development 2

#### TRIMESTER 2
- **Biologics Specialisation 1**
  - Expression Engineering
  - Bioprocess Engineering
  - Cell Culture Lab
  - Bioseparations 1 (Primary Purification)
  - Foundations of Finance

#### TRIMESTER 3
- **SMD Specialisation 1**
  - Medicinal Chemistry
  - Unit Operations 1 (Reactor Design, Distillation, Extraction)
  - Unit Operations 2 (Purification and Isolation)
  - Downstream Processing 1 (Particle Technology)
  - Foundations of Finance
## CURRICULUM STRUCTURE

### YEAR 3

<table>
<thead>
<tr>
<th>TRIMESTER</th>
<th>Biologics Specialisation 2</th>
<th>SMD Specialisation 2</th>
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<tbody>
<tr>
<td>1</td>
<td>Bioanalyticals</td>
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<td>Bioseparations 2</td>
<td>Downstream Processing 2</td>
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<td>(Secondary Purification)</td>
<td>(Blending and Tableting)</td>
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<td></td>
<td>Bioseparations Lab</td>
<td>Unit Operations Lab</td>
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<td>Process Safety</td>
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<td>Process Monitoring,</td>
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<td>Automation and Control</td>
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<td>2</td>
<td>Integrated Work Study</td>
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<td>Programme</td>
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<tr>
<td>3</td>
<td>Capstone Project</td>
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<td>Capstone Project</td>
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### YEAR 4

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<tbody>
<tr>
<td>1</td>
<td>Process Validation</td>
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<td>Plant Design and</td>
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<td>Operations</td>
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<td>Quality by Design in</td>
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<td>Development</td>
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<td>Project Management</td>
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</tbody>
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Students will be able to enrich their learning experience by embarking on various international programmes, such as the Overseas Exposure Programme (OEP), International Internship Programme (IIP), Student Exchange Programme (SEP), and Overseas Integrated Work Study Programme (OIWSP). They will have the opportunity to embark on a training attachment at pharmaceutical manufacturing facilities overseas, and work with modern industrial-scale unit operations in Good Manufacturing Practice (GMP) or GMP-simulated pharmaceutical manufacturing environments. Students will also have the opportunity to pick up state-of-the-art analytical technologies for pharmaceutical product monitoring and certification, gaining an insider’s view to the pharmaceutical industry. Through these carefully crafted international programmes, students can gain a global perspective of the industry’s best practices to inspire them further.

WHAT TO EXPECT

During the first year of the programme, students will build their fundamental and core knowledge in Pharmaceutical Engineering through lectures and tutorials, as well as project work and laboratory sessions. In tutorials, they will discuss ideas in depth with experienced faculty members and guest lecturers from the industry. Students will be expected to spend a considerable amount of time developing their own understanding of the topics covered in lectures, answering questions designed to check their understanding, and preparing for tutorials, projects and laboratory works. They are expected to work in teams of two to seven members on projects.

In the third year, students will undertake an eight-month Integrated Work Study Programme or an Overseas Integrated Work Study Programme with a company. They will also have the opportunity to go for Overseas Exposure Programme, International Internship Programme, Student Exchange Programme during their trimester break. In the final year, students will be expected to work on their final-year design project with their team members.

CAREER OPPORTUNITIES

Aside from the Pharmaceutical industry, graduates can look forward to working in, but not limited to, the following occupational fields:

- Chemicals
- Biotechnology and Life Sciences
- Flavours and Fragrances
- Nutraceuticals
The members of the Industry Advisory Committee for the SIT and Newcastle University Chemical Engineering and SIT Pharmaceutical Engineering programmes are:

**MR LIM HOCK HENG (CHAIRPERSON)**  
Vice President and Managing Director  
Glaxo Wellcome Manufacturing, Singapore

**ER GO HENG HUAT**  
Senior Consultant  
Occupational Safety and Health Division  
Ministry of Manpower

**MS GOH WAN YEE**  
Executive Director  
Healthcare and Wellness  
Economic Development Board

**MR TERENCE KOH**  
Executive Director  
Singapore Chemical Industry Council

**MR NORMAN LEE**  
Founder  
ACTSYS Process Management Consultants Pte Ltd

**ER LOI KHENG SEONG**  
Vice President  
Chemical Specialties Limited

**ER LUCAS NG**  
General Manager of Plant  
Petrochemical Corporation of Singapore

**DR KPP PRASAD**  
Vice President/Site Leader  
Tessa Therapeutics Pte Ltd

**MR JOSE SANCHEZ**  
Site Head  
Novartis Singapore Pharmaceutical Manufacturing Pte Ltd

**MR JOHN SMITH**  
Managing Director  
MSD International GmbH (Singapore)
SIT adopts an aptitude-based approach in assessing applicants for admission by considering the following criteria:

**MEETING THE MINIMUM ACADEMIC REQUIREMENTS***

- Diploma from any local polytechnic
- GCE A Level
- International Baccalaureate Diploma (IB)
- NUS High School Diploma
- Other Year 12 Equivalent Qualifications

**INTERVIEW PERFORMANCE**

All shortlisted applicants will be assessed through interviews. For specific degree programmes, applicants may have to submit portfolios or essays, and/or be assessed through written or technical tests.

*To help us understand the academic pathway you have taken, please fill in the details of both your entry qualification (i.e. Polytechnic Diploma/A Level/IB or equivalent Year 12 results), and your GCE O Level or equivalent Year 10 results/ITE (Nitec and Higher Nitec), when you apply for admission to SIT. SIT accepts applicants who did not sit for their GCE O Level examination, and have come through other forms of secondary or post-secondary education such as the Polytechnic Foundation Programme (PFP).
## ADMISSION REQUIREMENTS

<table>
<thead>
<tr>
<th>QUALIFICATION</th>
<th>Chemical Engineering (SIT &amp; NU Joint Degree)*</th>
<th>Chemical Engineering (SIT &amp; TUM Joint Degree)*</th>
<th>Food Technology</th>
<th>Pharmaceutical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIPLOMA FROM ANY LOCAL POLYTECHNIC</strong></td>
<td>Applicants with Chemical Engineering or closely related diplomas may apply for module exemptions.</td>
<td>Applicants with Chemical Engineering or closely related Science and Technology diplomas are strongly encouraged to apply. Subject to approval, diploma applicants may be granted module exemptions, based on the modules taken during their diploma.</td>
<td>Applicants with relevant diplomas (i.e Diploma in Food Science and Nutrition, Diploma in Food Science and Technology, Diploma in Applied Food Science and Nutrition), may apply for module exemptions of up to a maximum of three trimesters in the first year.</td>
<td>Applicants with relevant diplomas may apply for module exemptions. Exemptions may also be considered for relevant professional or industrial certifications.</td>
</tr>
<tr>
<td><strong>GCE A LEVEL</strong></td>
<td>Offered General Paper (GP) or Knowledge &amp; Inquiry (KI) in the same sitting, while satisfying the Mother Tongue Language (MTL) requirements.</td>
<td>Obtained a pass in General Paper (GP) or Knowledge &amp; Inquiry (KI) in the same sitting, while satisfying the Mother Tongue Language (MTL)* requirements.</td>
<td>Offered General Paper (GP) or Knowledge &amp; Inquiry (KI) in the same sitting, while satisfying the Mother Tongue Language (MTL) requirements.</td>
<td>A good pass in any three of the following H1/H2 subjects: (Biology, Chemistry, Physics and Mathematics)</td>
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<tr>
<td></td>
<td>A good pass in one H2 Mathematics</td>
<td>A pass in one H2 Mathematics</td>
<td>A good pass in one H2 Mathematics</td>
<td>A good pass in any three of the following H1/H2 subjects: (Biology, Chemistry, Physics and Mathematics)</td>
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<tr>
<td></td>
<td>A good pass in one H2 Science subject (Biological, Chemistry or Physics)</td>
<td>A pass in one H2 Science subject (Biological, Chemistry or Physics)</td>
<td>A good pass in one H2 Science subject (Biological, Chemistry or Physics)</td>
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<tr>
<td><strong>INTERNATIONAL BACCALAUREATE DIPLOMA (IB)</strong></td>
<td>Obtained the IB Diploma, while satisfying the Mother Tongue Language (MTL) requirements.</td>
<td>Obtained the IB Diploma, while satisfying the Mother Tongue Language (MTL)* requirements.</td>
<td>Obtained the IB Diploma, while satisfying the Mother Tongue Language (MTL) requirements.</td>
<td>Obtained the IB Diploma, while satisfying the Mother Tongue Language (MTL) requirements.</td>
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<tr>
<td></td>
<td>A good pass in HL Mathematics</td>
<td>A pass in one HL Mathematics</td>
<td>A good pass in HL Mathematics</td>
<td>A good pass in any three of the following SL/HL subjects: (Biology, Chemistry, Physics and Mathematics)</td>
</tr>
<tr>
<td></td>
<td>A good pass in HL Science subject (Biological, Chemistry or Physics)</td>
<td>A pass in one HL Science subject (Biological, Chemistry or Physics)</td>
<td>A good pass in HL Science subject (Biological, Chemistry or Physics)</td>
<td></td>
</tr>
<tr>
<td><strong>NUS HIGH SCHOOL DIPLOMA</strong></td>
<td>Obtained the NUS High School Diploma, while satisfying the Mother Tongue Language (MTL) requirements.</td>
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</tr>
<tr>
<td><strong>OTHER YEAR 12 EQUIVALENT QUALIFICATIONS</strong></td>
<td>Completed at least 12 years of formal education deemed as acceptable, equivalent qualifications to be considered for admission.</td>
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</tbody>
</table>

*Graduates of this programme may choose to continue taking the MSc Chemical Engineering.

*GCE A Level/IB applicants need to fulfil the language requirements, as stipulated by the German Higher Education System. GCE A Level applicants must have taken two language subjects, out of which one must be at H1 to fulfil the language requirements, as stipulated by the German Higher Education System. If you have been exempted from taking MTL for your GCE A Level, you can retake the subject to fulfil the language requirements. Additionally, there are specific conditions which IB applicants are required to fulfil (details are listed on the website). For further enquiries on the various requirements, please contact TUM Asia Admissions Office at admission@tum-asia.edu.sg.

For up-to-date information, please refer to SingaporeTech.edu.sg.
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OPERATING HOURS

The operating hours for all hotlines are from Mondays to Fridays, 11:00 am to 3:00 pm. Closed on Saturdays, Sundays and Public Holidays.

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