VISION
A great global engineering college for education, research and innovation.

MISSION
To nurture creative and entrepreneurial leaders through broad-based, research-infused engineering education, advance knowledge and create innovative and sustainable solutions for the benefit of industry and society.

CONTENTS
What is Engineering? 02
Why Engineering? 02
Top Reasons to choose NTU College of Engineering 03
Programmes at a Glance 05
Minimum Subject Requirements for Admissions 10
School of Civil and Environmental Engineering (CEE) 14
School of Electrical and Electronic Engineering (EEE) 18
School of Mechanical and Aerospace Engineering (MAE) 22
School of Materials Science and Engineering (MSE) 26
School of Chemical and Biomedical Engineering (SCBE) 30
School of Computer Science and Engineering (SCSE) 34
What is Engineering?

Engineering is the application of mathematical, scientific, economic, social and practical knowledge to solve problems to improve the world around us.

Why Engineering?

Engineers make a **DIFFERENCE** to the world we live in, through new and enhanced solutions that improve lives and environment.

Engineering education equips you with knowledge and skills that are highly transferable across all sectors.

Engineers are in growing demand.1, 2

2 “Singapore’s long game in innovation,” The Straits Times, August 2017.
TOP REASONS
to choose NTU College of Engineering

World Leader in Engineering Education and Research

1st in Asia* | 5th Globally*

internationally-renowned engineering schools ranked in the world’s TOP 21 by subject

Multidisciplinary and Well-rounded Curriculum

Robust Professional Internship and Attachment Programmes

Gain real-world and professional experience at companies like Rolls-Royce and BMW

Vibrant Campus Life

2-Year Residential Living guaranteed for all freshmen

Wide variety of F&B options and comprehensive retail and service stores
Global Exposure

8 in 10 students undergo overseas immersion at least once during their studies

Internationally-renowned Faculty and World-class Research and Learning Facilities

Exciting Student Life

Over 100 student clubs to cater to diverse interests

Experiential Learning Opportunities

Numerous opportunities such as the Undergraduate Research Experience on Campus (URECA) and other International/National-level competitions to stretch the potential of students

Making and tinkering spaces for students to explore and create

* QS World University Rankings by Subject 2018
Programmes at a Glance

NTU College of Engineering offers a broad-based and multidisciplinary curriculum which integrates engineering with arts, humanities, business and social sciences. We equip students with not only technical knowledge but also analytical, problem-solving, entrepreneurial and communication skills that are highly valued and sought after by employers.

Students can choose from 14 single degree programmes. In addition, students can also read a minor, second major or double degree.

<table>
<thead>
<tr>
<th>Single Degrees (Direct Honours)</th>
<th>Minors</th>
<th>Second Majors</th>
<th>Double Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE</td>
<td>Civil Engineering&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Food Science and Technology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental Engineering&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Medical Biology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maritime Studies&lt;sup&gt;6&lt;/sup&gt;</td>
<td>Pharmaceutical Engineering</td>
<td></td>
</tr>
<tr>
<td>EEE</td>
<td>Electrical and Electronic Engineering&lt;sup&gt;7&lt;/sup&gt;</td>
<td>Society and Urban Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information Engineering and Media&lt;sup&gt;8&lt;/sup&gt;</td>
<td>Engineering and Economics</td>
<td></td>
</tr>
<tr>
<td>MAE</td>
<td>Aerospace Engineering&lt;sup&gt;9&lt;/sup&gt;</td>
<td>Computer Engineering/Computer Science and Business</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanical Engineering&lt;sup&gt;10&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSE</td>
<td>Materials Engineering&lt;sup&gt;11&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bioengineering&lt;sup&gt;12&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCBE</td>
<td>Chemical and Biomolecular Engineering&lt;sup&gt;13&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer Engineering&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Computer Science&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Science and Artificial Intelligence&lt;sup&gt;8&lt;/sup&gt;</td>
<td></td>
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<td>Mathematical and Computer Sciences&lt;sup&gt;4&lt;/sup&gt;</td>
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</table>

Additional programmes include:
- Bachelor of Science Programme
- Bachelor of Engineering Programme

* Bachelor of Engineering Programme
All Bachelor of Engineering programmes are accredited by the Institution of Engineers Singapore, the Singapore signatory of the Washington Accord, through its Engineering Accreditation Board. The Washington Accord is an international agreement for mutual recognition of the substantial equivalence of engineering academic programmes in satisfying the academic requirements for the practice of engineering at the professional level.

<sup>1</sup> Bachelor of Engineering Programme
<sup>2</sup> Bachelor of Science Programme
In addition to their single degree, students are also able to pursue a minor to broaden their knowledge and skills, beyond what their major disciplines may provide. Students can choose from a wide range of minor programmes such as Computing and Data Analysis, Entrepreneurship, Finance, Life Sciences, Linguistics and Multilingual Studies, Public Policy and Global Affairs, Psychology, Sociology, etc.

For the full list of minor programmes available, please refer to: www.coe.ntu.edu.sg/Minor_Programme

Second Majors

Second Major in Business

Jointly offered by the College of Engineering and Nanyang Business School, this programme equips students with soft skills of management and leadership inherent to Business studies, in addition to the technical competencies of their Engineering or Maritime Studies major.

Right from Year 1, students take Business foundation courses alongside their Engineering major or Maritime Studies major courses. At the end of Year 1, students can continue with the Second Major in Business (Mainstream) or branch into the International Trading Programme (ITP) under the second major via an ITP Opt-In Exercise.

Students taking the Second Major in Business (Mainstream) will not only acquire relevant knowledge in understanding how business decisions are made in the real world, but are also exposed to a holistic education that helps them become technically skillful, managerially competent leaders with a business-oriented outlook. Students taking the Second Major in Business (International Trading Programme) can look forward to a comprehensive curriculum in international trading, practical industry-related training, and extensive networking opportunities that prepares them for an exciting and rewarding spectrum of career opportunities available in the entire value chain of the international trading sector.

Please refer to the following for more information.

- Engineering in a chosen major with a Second Major in Business: www.coe.ntu.edu.sg/EngBizMajor
- Maritime Studies with a Second Major in Business: www.coe.ntu.edu.sg/ms
Second Major in Food Science and Technology

The programme is a collaboration between NTU and the prestigious Wageningen University from the Netherlands, whose Food Technology programme is one of the best and most innovative in Europe. Five core courses will be taught by the faculties from Wageningen University with coordinators at NTU. Students will be at the forefront of resolving current and future challenges in food security for Singapore and beyond. These include system integration for enhanced food production, novel technologies for food waste reduction and conversion, food nutrition for an ageing population, as well as risk analysis and management in food safety. This Second Major will open up myriad career opportunities in food industries including multinational corporations, government regulatory agencies, research institutions and local organisations.

For more information on the programme, please refer to: www.ntu.edu.sg/fst

Second Major in Medical Biology

Jointly offered by the College of Engineering and College of Science, this programme is a collaboration between NTU and the prestigious Wageningen industries, in addition to biomedical industries both locally and abroad.

Second Major in Society and Urban Systems

Jointly offered by the College of Engineering and College of Humanities, Arts and Social Sciences, the programme offers students an insightful interdisciplinary study on contemporary urban systems. Students will acquire understanding and develop appreciation for the rationale and processes behind the emergence, growth and evolution of the urban built environment from its natural environment. In addition to engineering and technological aspects, students will also study the social, political, economic and cultural facets of urban systems planning and policy-making. With this programme, students will be able to integrate, synthesise and develop perspectives and solutions for a sustainable urban built environment. Graduates can look forward to broad and diverse career options in the built environment sector.

For more information on the Second Major in Society and Urban Systems, please refer to: www.coe.ntu.edu.sg/SUS

Second Major in Pharmaceutical Engineering

Students in this programme will acquire specialised knowledge in drug design and development. They will also have opportunities to work with leading biopharmaceutical companies to gain first-hand experience in drug design and development. This programme prepares students for exciting and meaningful careers in the pharmaceutical industries, spanning key sectors such as pharmacy and biotechnology, biomedical and clinical sciences, healthcare and research and development.

For more information on the programme, please refer to: www.coe.ntu.edu.sg/PE

Second Major in Society and Urban Systems

For more information on the Second Major in Society and Urban Systems, please refer to: www.coe.ntu.edu.sg/SUS

Double Degrees

Double Degree in Engineering and Economics

This double degree programme, jointly offered by the College of Engineering and the College of Humanities, Arts and Social Sciences, equips students with excellent knowledge and competency in engineering and economics over the programme duration of 5 years. Armed with two honours degrees – Bachelor of Engineering (Honours) in a chosen major and Bachelor of Arts (Honours) in Economics, graduates can expect wider career options in engineering and economics-related industries and beyond. Engineers who have strong economic knowledge are also better equipped for management positions as they move up the corporate ladder. To the enterprising individuals, technical prowess and a good grasp of economic principles are essential for the sustenance of free enterprises and entrepreneurship.

For more information on the double degree programme in Engineering and Economics, please refer to: www.coe.ntu.edu.sg/DEEngEcon

Double Degree in Computer Engineering/Computer Science and Business (with specialisation in Business Analytics)

A collaboration with the Nanyang Business School, these double degree programmes allow students to hone their business management skills and excel at software application or computer engineering and development skills within the typical candidate period of 4 years. Students will develop strong foundations in business and computer engineering or computer science disciplines and acquire relevant skills that are much sought after in today’s job market. At the end of 4 years, students will graduate with 2 honours degrees – Bachelor of Engineering (Honours) in Computer Engineering or Computer Science and Bachelor of Business (Honours) (with specialisation in Business Analytics). With the mix of business skills and technical knowledge, graduates can play dual roles and expect great career advancements by being IT-savvy and possessing strong business acumen.

For more information on the double degree programme in Computer Engineering/Computer Science and Business (with specialisation in Business Analytics), please refer to: www.coe.ntu.edu.sg/nbsdd

Double Degree in Computer Engineering/Computer Science and Economics

For more information on the double degree programme in Computer Engineering/Computer Science and Economics, please refer to: www.coe.ntu.edu.sg/DDEngEcon

Double Degree in Computer Engineering/Computer Science and Business (with specialisation in Business Analytics)

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For more information on the double degree programme in Engineering and Economics, please refer to: www.coe.ntu.edu.sg/DEEngEcon
Please refer to the minimum subject requirements for single degree Engineering programmes stated above.

Bachelor of Science (B.Sc) Programmes

- Data Science and Artificial Intelligence
- Computer Science
- Mathematics and Computer Science

Double Degree Programmes

- Bachelor of Engineering/Bachelor of Science in Engineering (BEng/BS) and Bachelor of Business (with specialisation in Business Analytics)
- Bachelor of Engineering in Biomedical Engineering and Bachelor of Business (with specialisation in Business Analytics)

Second Majors

- Bachelor of Engineering in your chosen major with a Second Major in Business
- Bachelor of Engineering in Biomedical Engineering and a Second Major in Health Science and Technology
- Bachelor of Engineering in Materials Engineering with a Second Major in Medicine
- Bachelor of Engineering in Biomedical Engineering with a Second Major in Pharmaceutics
- Bachelor of Engineering in Materials Engineering with a Second Major in Pharmaceutical Engineering
- Bachelor of Engineering in Civil Engineering and a Second Major in Engineering with a Second Major in Society and Urban Systems
- Bachelor of Science in Materials Studies with a Second Major in Business

Part-Time Bachelor of Engineering (B.Eng) Programmes

- Computer Science
- Electrical and Electronic Engineering
- Mechanical Engineering
CEE

School of Civil and Environmental Engineering
Mobilising Resources to Build Better Environments
Be in the vanguard of committed civil, environmental or maritime professionals overcoming challenges to bring a better life to the many discrete societies of the world.

Clean water to homes in remote corners of the earth, renewable sources of energy and water reclamation – your field covers all these areas and much more, in addition to building bridges and other infrastructure which are key to any progressive economy. Imagine the world as you would like it to be and then take the step to make it happen.

At the School of CEE, you will find a technologically stimulating environment conducive to education and research. Through collaborations with industry partners and overseas institutions, our programmes are professionally oriented and provide opportunities to contribute to industry and society.

DEGREE PROGRAMME IN CIVIL ENGINEERING

The Civil Engineering curriculum equips students with the professional knowledge and skills needed to excel in a challenging career as a civil engineer. In this programme, students will acquire knowledge in areas such as geotechnical planning, construction technology and data management, as well as offshore and coastal engineering.

Areas of Specialisation

• Coastal Engineering
• Construction Technology and Processes
• Environmental Engineering
• Foundation Engineering
• Geotechnical Engineering
• Ground Engineering
• Highway Engineering
• Structural Engineering
• Traffic Engineering
• Water Resources Engineering

Industries and Career Opportunities

• Airport Engineering
• Concrete and Building Technology
• Construction Management
• Fire Engineering
• Infrastructure Planning
• Land Development and Improvement
• Project Management
• Protective Engineering
• Seismic Engineering
• Transportation Planning
DEGREE PROGRAMME IN ENVIRONMENTAL ENGINEERING

This programme imparts knowledge, skills and capabilities across a wide spectrum of environmental engineering domains. You will gain an in-depth perspective into the role you can play in building and maintaining sustainable living environments. Under this programme, you will acquire knowledge in areas such as sustainable resources management, environmental monitoring and data management, as well as aquatic ecosystems and marine environment.

Areas of Specialisation
- Air Pollution Control Engineering
- Membrane Water Reclamation Technology
- Solid and Hazardous Waste Management
- Wastewater Engineering
- Water Resources Management
- Water Supply Engineering

Industries and Career Opportunities
- Desalination
- Environmental Technologies Development
- Membrane Technologies
- Resource Recovery
- Wastewater Reclamation and Reuse
- Water and Wastewater Treatment
- Water Resources Engineering

DEGREE PROGRAMME IN MARITIME STUDIES

The Maritime Studies degree programme will equip you with the necessary expertise in shipping, business and management, as well as maritime science and technology to meet the rising challenges in the maritime industry. Through the curriculum, you will acquire knowledge in areas such as ship chartering/accounting, shipping management, as well as maritime science and technology. If you are pursuing the Maritime Studies degree programme with a Second Major in Business, your comprehensive learning journey will include core business courses such as accounting, business environment and marketing.

Areas of Specialisation
- Distribution and Warehousing
- Intermodal Transportation
- Marine Insurance
- Port Economics/Shipping Economics
- Port Planning and Operations
- Ship Chartering
- Shipping Management

Industries and Career Opportunities
- Shore-based jobs which include:
  - Chartering/Logistics
  - Freight Forwarding
  - Marine Operations
  - Market Intelligence
  - Post-Fixture
  - Supply Chain/Export/Import
  - Trade/Pricing/Brokerage
  - Transportation Sales
  - Voyage Planning

DOUBLE DEGREE PROGRAMMES
- Civil Engineering and Economics
- Environmental Engineering and Economics

SECOND MAJORS
- Civil Engineering with a Second Major in Business
- Civil Engineering with a Second Major in Society and Urban Systems
- Environmental Engineering with a Second Major in Business
- Environmental Engineering with a Second Major in Society and Urban Systems
- Maritime Studies with a Second Major in Business
At CEE, we are able to hone our skills in analytical, critical thinking, problem-solving and interpersonal skills, through the broad curriculum and extra-curricular activities.

CEE also provides various opportunities for us to explore and deepen our knowledge through participation in competitions, professional internships, conferences, research and exchange programmes with other top overseas universities. One of the competitions that I had participated in was the Productivity Challenge 2017 in which our team successfully made it to the final round and presented our work to passionate audiences. During my Final Year Project, my research work contributed to some important findings, which were subsequently presented at the prestigious 20th International Conference on Applied Geotechnics and Engineering. The mentorship from CEE professors and the dynamic university experience had definitely left a deep impression on me. CEE is definitely the school that you should consider if you would like to further develop your analytical and critical thinking skills.

DID YOU KNOW?

CEE has invented a new type of concrete that is bendable yet stronger and longer lasting than regular concrete which is heavy, brittle and breaks under tension. Named ConFlexPave, this innovation allows the creation of slim precast pavement slabs for quick installation, thus halving the time needed for road works and new pavements. It is also more sustainable, requiring less maintenance.

Peh Hoong Ping
Class of 2018
Bachelor of Engineering in Civil Engineering
Honours (Highest Distinction)
Consultant Engineer at WSP Consultancy Pte Ltd

Achievements
Dean’s List, AY2015-2018
Koh Boon Hwee Scholars Award Winner, 2018
School of Electrical and Electronic Engineering

One Degree, A World of Opportunities
Position yourself in one of the top Electrical and Electronic Engineering schools in the world today and learn from the top faculty members. You will electrify the world through innovation wonders.

Be it revolutionising the way people connect through the next generation super smartphones, or creating intelligent nano-gadgets to empower industry, you will be equipped with the most relevant technological knowledge and hands-on experience.

By building on your forte in Electrical and Electronic Engineering, you empower yourself to take part in sculpting the latest innovation and shaping people’s lives in the modern world.

With the mentorship from our brilliant faculty and access to our world-class equipment and modern research laboratories, you will realise your full potential as a top notch electrical and electronic engineer.

DEGREE PROGRAMME IN ELECTRICAL AND ELECTRONIC ENGINEERING

This programme offers students the flexibility to choose between a broad-based electrical and electronic engineering education or engage in one of the 8 specialisations.

Areas of Specialisation

- Data Intelligence and Processing
- Biomedical Electronics
- Communications Engineering
- Computer Engineering
- Electrical Power and Energy
- Integrated Circuit Design
- Intelligent Systems and Control Engineering
- Microelectronics

Industries and Career Opportunities

- Aviation
- Banking and Finance
- Biomedical and Healthcare
- Computer Engineering
- Control and Automation
- Electronics
- Information Technology and Communications Services
- Integrated Circuit (IC) Design
- Interactive and Digital Media
- Internet Services
- Machinery and Equipment
- Manufacturing
- Optoelectronics
- Power Generation and Smart Energy Distribution
- Public Administration and Defence
- Research and Development
- Semiconductors
DEGREE PROGRAMME IN INFORMATION ENGINEERING AND MEDIA

With the merger of infocomm and media, this programme aims at producing well-rounded engineers with a strong foundation of engineering principles as well as a broad understanding of the creative design process.

The engineering modules cover technical courses in Information and Communications Engineering such as programming, communications and networking, and digital audio/image/video processing. This strong emphasis on technical foundation produces infocommunication professionals equipped to work in the IT, computer and communications sectors.

The art and media modules cover courses such as digital art and design, animation and game design, and audio/image/sound production. This allows students to graduate with a sound knowledge of media design and production, in line with industrial needs. Equipped with strong infocommunication engineering skills and sound understanding of the artistic and creative processes, graduates of the Information Engineering and Media (IEM) programme are highly valued in the professional world.

Areas of Specialisation

- Art, Design and Media Production
- Communications and Networking
- Digital Media Processing
- Information Technology
- Visualisation and Interactive Media

The IEM programme is hosted by the School of EEE and jointly offered with the School of Art, Design and Media, School of Computer Science and Engineering and the Wee Kim Wee School of Communication and Information.

Industries and Career Opportunities

- Digital Media Design and Production
- Embedded System Design
- Gaming, Animation and Interactive Entertainment
- Hardware Design and Manufacturing
- Hardware/Software System Integrator
- Information Technology Services
- Software Analyst/Architect
- Telecommunications and Network Services

DOUBLE DEGREE PROGRAMMES

- Electrical and Electronic Engineering and Economics
- Information Engineering and Media and Economics

SECOND MAJORS

- Electrical and Electronic Engineering with a Second Major in Business
- Electrical and Electronic Engineering with a Second Major in Society and Urban Systems
- Information Engineering and Media with a Second Major in Business

# Jointly offered with the College of Humanities, Arts and Social Sciences
* In collaboration with the Nanyang Business School
a In collaboration with the College of Humanities, Arts and Social Sciences
I like the fact that the School of EEE encourages students to venture beyond what our curriculum offers. The school provides us with many platforms and opportunities since freshman year to allow us to embark on a journey of self-discovery.

The School strongly encourages us to take on leadership roles in various initiatives and platforms and ensure that we are well-supported in our pursuits. We are always able to seek help and assistance, be it in academic matters, pastoral care or holistic development. Being the Chairperson of Garage@EEE has been an extremely rewarding experience despite the challenges faced such as managing the student body. It has also allowed me to further hone my problem-solving, communication and people skills. My Summer Exchange at Hanyang International Summer School in Seoul, South Korea was also an eye-opening experience as I had to adapt to a different culture and lifestyle and experience how studying overseas is different from that of Singapore.

In summary, the School of EEE has provided me with an all-rounded platform that develops me in both academic and non-academic aspects such as personal growth and development.

Helen Choo Hwee An
Undergraduate, Year 4
Bachelor of Engineering in Electrical and Electronic Engineering

Achievements
Chairperson, Garage@EEE, 2018-2019
NTU Student Panel Speaker, National TEL 2017 Conference, 2017

DID YOU KNOW?

Fact #1
Garage@EEE is a student-dedicated space at the School of EEE, taking on a different approach to conventional learning. This white space where students initiate not just projects but also workshops, allows EEE students to engage in interdisciplinary projects.

Fact #2
Researchers from the School of EEE have developed a processing chip that uses less power to better detect brain signals and identify their neuron sources, a process called spike sorting. Their real-time processing, multi-channel chip is believed to be the first of its kind, and could lead to more compact neural implants.
As a Mechanical Engineer, you could be part of the force revving up new equipment ranging from machineries to vehicles to robots. Or, if the idea of an Aerospace Engineer excites you more, make a career in powering the aircraft and flight systems of the future.

At the School of MAE, our comprehensive and broad-based curricula will help you tap the forces that are fast transforming the world’s technological landscape: developments in robotics, nanotechnology, aerospace, and the life sciences, among others. With the guidance of the talents among our faculty and access to our state-of-the-art facilities for teaching and research, you will enjoy opportunities to accentuate your learning experiences while contributing to the development of future technologies.

You will also participate in a 20-week professional internship programme with companies as prestigious as Rolls-Royce International, and therefore relish the experience of a professional working environment and gain valuable practical experience.

DEGREE PROGRAMME IN AEROSPACE ENGINEERING

This programme equips students with specialty training and tools, allowing them a seamless entry into the challenging aerospace industry. Under the Aerospace Engineering degree programme, students will acquire knowledge in areas such as Aerodynamics, Aircraft Design and Aircraft Propulsion.

Areas of Specialisation

A specialised degree that covers exciting topics such as the design and optimisation of flight vehicles and their propulsion systems.

Industries and Career Opportunities

- Aerospace Consulting
- Air Traffic Management
- Aircraft Design and Manufacturing
- Aircraft Operations and Maintenance
- Aviation Regulatory Bodies
- Defence Systems and Management
- Finance and Banking
- Project Planning and Management
- Research and Development
- Teaching
- And many other engineering and non-engineering related jobs
DEGREE PROGRAMME IN MECHANICAL ENGINEERING

Under this programme, students will start off by establishing sound engineering fundamentals before advancing to a spectrum of industrially relevant specialisations in the senior years. Specialisations can range from Aeronautical Engineering, Naval Architecture and Marine Engineering to Energy and the Environment.

Areas of Specialisation

3 specialised streams:
- Design Stream
- Robotics and Mechatronics Stream
- Mainstream
  (Optional Final Year Specialisations):
  - Aeronautical Engineering
  - Energy and the Environment
  - Manufacturing Engineering
  - Naval Architecture and Marine Engineering
  - Systems Engineering

Industries and Career Opportunities

- Aeronautical Engineering
- Biomedical Engineering
- Clean Energy
- Defence Organisations
- Finance and Banking
- Logistics
- Manufacturing
- Marine and Offshore Engineering
- Mechatronics and Control
- Power Generation and Distribution
- Product Design
- Project Planning and Management
- Research and Development
- Robotics
- Semiconductors
- Teaching
- And many other engineering and non-engineering related jobs

DOUBLE DEGREE PROGRAMMES

- Aerospace Engineering and Economics
- Mechanical Engineering and Economics

SECOND MAJORS

- Aerospace Engineering with a Second Major in Business
- Mechanical Engineering with a Second Major in Business
- Mechanical Engineering with a Second Major in Society and Urban Systems

Jointly offered with the College of Humanities, Arts and Social Sciences
In collaboration with the Nanyang Business School
In collaboration with the College of Humanities, Arts and Social Sciences
The professors in MAE are really helpful and dedicated. You can stay back after lectures to ask questions, email them or arrange for face-to-face consultations with the professors. Going for a semester-long exchange at Georgia Institute of Technology was another eye-opening experience for me as I had the opportunity to interact with many professors who have worked in top aerospace firms such as Boeing and even NASA.

Apart from academic knowledge, I have also developed and honed my leadership and organisational skills when I took up different roles in CN Yang Scholars’ Club.

In short, MAE is the best place to receive a world-class engineering education and have fun at the same time.

Alenson Toh Jun Wei
Undergraduate, Year 4
Bachelor of Engineering in Aerospace Engineering

Achievements
CN Yang Scholars Programme
Nanyang Scholarship Holder, AY2015-2018
Financial Controller of CN Yang Scholars’ Club, 2016-2017

Fact #1
MAE charges to 14th spot globally based on the 2018 QS World University Rankings by Subject.

Fact #2
Our two-storey-high and 13-metre wide control tower simulator at Air Traffic Management Research Institute (ATMRI), School of MAE, which provides a 360-degree-view, is one of the largest air traffic control towers for research purposes in the world.
At the core of all facets of life, materials stand firm as the pillar for all engineering fields. Whether it is to make the humble glass ‘smarter’, or to produce a biocompatible glue to replace sutures in surgery, the search for materials that transform and disrupt new technological frontiers is never ending.

If you are excited about materialising life-changing solutions, start by enrolling at the School of Materials Science and Engineering (MSE) and enter the fascinating world of materials.

One of the world’s largest and most comprehensive materials engineering institutions, MSE offers an application-oriented engineering education in advanced materials, intertwined with a global perspective. Our comprehensive and all-rounded degree programmes will equip you with the specialised knowledge and soft skills needed to succeed in the workplace.

Join us in pioneering, innovating and designing the next avant-garde materials to improve the quality of life for ourselves and the future generation.

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DEGREE PROGRAMME IN MATERIALS ENGINEERING

Materials Science and Engineering is a confluence of chemistry, physics, biology and engineering mathematics. Here, you will master the basic structure and properties of various materials and understand how they can be designed, processed and modified to enhance their performance to suit specific needs. Building on fundamental knowledge, you will further discover and learn about nanomaterials for biomedical applications, environmental and sustainable energy applications, advanced functional materials for defence systems and sports applications, flexible and nanoelectronic materials for future smart technologies, and many more revolutionary materials applications.

**Areas of Specialisation**
- Industrial Materials Engineering
- Innovation and Intellectual Property
- Medical Materials
- Nanoscience and Nanotechnology

**Industries and Career Opportunities**
- Aerospace
- Aviation
- Banking and Finance
- Biomedical
- Defence
- Education
- Electronics
- Engineering
- Fast Moving Consumer Goods
- Food and Nutrition
- Government Agencies
- Healthcare
- Manufacturing
- Offshore and Marine
- Oil and Gas
- Pharmaceuticals
- Renewable Energy
- Research and Technology
- Semiconductors
- Technological Start-ups
The resources and opportunities for undergraduates are aplenty at NTU MSE. I am privileged to be given the opportunity to embark on numerous overseas exchange programmes, where I got to interact, share and exchange knowledge as well as make new friends. My internship at the Agency for Science, Technology and Research (A*STAR) was another invaluable experience. Apart from applying what I have learnt in MSE, I also picked up crucial life skills such as communication and leadership skills. As a member of the MSE’s Leadership Excellence Programme (LEP), I attended various leadership and management workshops that have honed my analytical and critical thinking skills.

NTU MSE feels like a second home to me. The professors here are nurturing and caring, they are constantly looking after our well-being and checking on our progress. To sum up, my experience at NTU MSE had been a fruitful, enjoyable and extraordinary one!
Fact #1
NTU MSE is ranked world number 1 in the 2019 U.S. News and World Report Best Global Universities Rankings for Materials Science. It is also ranked 3rd globally in the 2018 QS World University Rankings by Subject for Materials Science. We are also the largest materials engineering institution in the world, driving science and technology to prepare you for today’s industry and the future economy.

Fact #2
At MSE, you will be exposed to a curriculum that is a vibrant blend of theory, technical competencies and soft skills. You can also expect an enriching undergraduate life where you can participate in student-led activities, hone your leadership skills through our MSE UnderGRAduate Programme for Holistic Education and Experience (GRAPHENE), or join our annual Ian Ferguson Innovation Challenge (IFIC) if you aspire to be an entrepreneur!
SCBE

School of Chemical and Biomedical Engineering
Advancing Sustainable Future through Chemical and Biomedical Innovation
Bioengineers as well as Chemical and Biomolecular engineers have unique backgrounds, allowing one to apply fundamental principles and problem-solving skills to many different areas of need (e.g. energy, water, materials, and medicine). Even as these areas of need evolve, you will be ready.

Due to the cross-disciplinary nature encompassing biology, chemistry, materials, physics, advanced mathematics, and all the wide-ranging research areas observed today, you will be well-positioned to address and harness technological and societal opportunities yet to be conceived. Embark on this exciting journey with us - the future is full of potential and opportunities for you.

**Core areas of Chemical and Biomolecular Engineering and Bioengineering expertise are being augmented by new expertise in science and engineering at molecular and nanometer scales, in bio-systems, in sustainability, and in cyber-tools. Be the catalyst to advance wide-ranging fields spanning biotechnology, pharmaceuticals, medical devices and many more.**

**DEGREE PROGRAMME IN CHEMICAL AND BIOMOLECULAR ENGINEERING**

Chemical and biomolecular engineering is the branch of engineering that deals with the application of physical (e.g. chemistry and physics), and life sciences (e.g., biology, microbiology and biochemistry) with mathematics and economics to convert raw materials or chemicals into more valuable forms. Applications span food science, carbon capture and utilisation, pharmaceuticals and drug delivery, nanotechnology, fuel cells and biomedical engineering.

Ranked 14th in the world according to the 2018 QS World University Rankings by Subject, the chemical and biomolecular engineering programme at SCBE aims to equip a new generation of chemical and biomolecular engineers with the right skill sets to excel in the chemical/petrochemical/ biomedical/pharmaceutical industries, as well as other emerging industries in Singapore and around the world.

**Focus Tracks**
- Advanced Pharmaceutical Manufacturing
- Intellectual Property
- Machine Learning and Data Analytics

**Industries and Career Opportunities**
- Manufacturing industries:
  - Oil and gas
  - Pharmaceutical/bio-pharmaceuticals
  - Semiconductor
  - Specialty chemicals/petrochemicals
- Research and development:
  - Biomedical
  - Biotechnology
  - Food/flavours/fragrances
  - Nanotechnology
  - Process and product development
- Trading and finance related jobs in relevant industries
Areas of bioengineering seamlessly fuse the various disciplines of engineering and biomedical science as one. Both fields are complementary; the core technologies from engineering are applied in several biomedical science areas and have led the progression of engineering into areas including biomedical imaging, biomedical instrumentation, biomaterials and tissue engineering.

The Bioengineering programme at SCBE empowers students with advanced skill sets to apply fundamental principles and methods of engineering to address industrial trending challenges in bioengineering, medical/life sciences and its related areas, and to understand the implications of these solutions on real-life industry situations.

**Focus Tracks**
- Advanced Pharmaceutical Manufacturing
- Intellectual Property
- Machine Learning and Data Analytics

**Industries and Career Opportunities**
- Manufacturing industries:
  - Biomaterials
  - Biomedical instrumentation
  - Medical devices
  - Pharmaceutical/bio-pharmaceuticals
  - Semiconductor
- Research and development:
  - Biomaterials
  - Biomedical instrumentation
  - Biotechnology
  - Drug discoveries
  - Medical devices
  - Start ups
- Regulatory affairs
- Trading and finance related jobs in relevant industries

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**DEGREE PROGRAMME IN BIOENGINEERING**

**DOUBLE DEGREE PROGRAMMES**

- Bioengineering and Economics
- Chemical and Biomolecular Engineering and Economics

**SECOND MAJORS**

- Bioengineering with a Second Major in Business
- Bioengineering with a Second Major in Food Science and Technology
- Bioengineering with a Second Major in Pharmaceutical Engineering
- Chemical and Biomolecular Engineering with a Second Major in Business
- Chemical and Biomolecular Engineering with a Second Major in Food Science and Technology

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<sup>* Jointly offered with the College of Humanities, Arts and Social Sciences</sup>
<sup>** In collaboration with the Nanyang Business School</sup>
<sup>+ In partnership with the Wageningen University (The Netherlands), NTU School of Biological Sciences and School of Physical and Mathematical Sciences</sup>
SCBE enables us to lead, serve, and find solutions in a rapidly changing world. Its curriculum is tailored to be challenging, so that we can develop critical-thinking skills, yet not overbearing in a way that leaves us helpless, as our professors are always willing to mentor us.

The School also provides many opportunities for personal development beyond studies and research.

Ling Cher Keane
Undergraduate, Year 3
Bachelor of Engineering in Chemical and Biomolecular Engineering

Achievements
Nanyang Scholarship Holder, AY2016-2018
Recipient of Global Integration Leadership Programme (GILP)

SCBE’s research team discovered a breakthrough using semiconducting polymer nanoparticles (SPNs) based on poly (phenylenevinylene) to emit long-lasting afterglow light. The particles are a classification of optically active photonic materials. They are less than 40 nm in size, completely organic, biodegradable and contain biologically benign ingredients which are non-toxic. These particles could be used to image biostructures like lymph nodes and tumours. Furthermore, this application can also evolve into smart molecular probes that only glow in the presence of biomarkers, which allow the researchers to image liver injury in mice.
SCSE
School of Computer Science and Engineering
Lead the Change | Innovate the Future
From our transportation links to our communal spaces and the way we manage our environmental resources, technologies converge to make a positive difference. They give rise to the concept of smart cities which use digital information and communication technologies to transform urban areas into greener, more cost-efficient and generally more pleasant spaces to be in. At the same time, the evolution of connected devices – such as wearables and smartphones – means that more of us can interact within the digital architecture of where we live, work and play. It is a wave of technological advancement that is unstoppable.

By coming on board at SCSE, you can ride this wave as a computer engineer or scientist to leave a positive mark on your economy and society. You will be expanding your technology capacities exponentially at the same time. An acknowledged pathfinder in the field of computer engineering and computer science, SCSE has the state-of-the-art equipment to support and complement our broad-based and comprehensive degree programmes. Our stimulating environment along with our reputable faculty, will inspire you to be among an elite group of computer engineers and scientists pioneering and designing solutions to challenges ahead.

As the world becomes increasingly urban, computer technologies play a leading role in shaping our cities into pleasant, progressive and planet-friendly environments for work and daily life.

Committed to letting you tap all your capabilities and talents, we offer you a wide range of direct honours degree programmes, second majors, double major and double degree programmes that consist of both regular projects and group work. With solid foundation, hands-on experience and topped with in-depth theoretical knowledge as well as strong analytical skills, the graduates of SCSE are assured of their marketability in any industry as the demand for quality computing graduates is set to rise. Aimed at harnessing information technologies, networks and data for a better quality of life, this programme is a huge employment conduit for our graduates.

DEGREE PROGRAMME IN COMPUTER ENGINEERING

This programme is a distinctive fusion of computer hardware technologies and software engineering. Under this programme, you will be trained in both hardware and software designs as well as hardware-software integration. Graduates of Computer Engineering are highly valued and sought after in various industries for their broad knowledge in programming and digital systems, coupled with the specialised skills in software and hardware interfacing.

Areas of Specialisation
- Artificial Intelligence
- Cyber Physical System
- Cyber Security
- Data Science and Analytics
- High Performance Computing
- Networking and Mobility

Industries and Career Opportunities
- Cyber Physical Systems Industries
- Cyber Security Industries
- Defence and Research Industries
- Embedded Systems Industries
- Enterprise Network Management
- Hardware Development Industries
- Research and Development and many more
Jointly offered with the Nanyang Business School, with specialisation in Business Analytics

Jointly offered with the College of Humanities, Arts and Social Sciences

In collaboration with the Nanyang Business School

DOUBLE DEGREE PROGRAMMES

• Computer Engineering and Business
• Computer Engineering and Economics
• Computer Science and Business
• Computer Science and Economics

SECOND MAJORS

• Computer Engineering with a Second Major in Business
• Computer Science with a Second Major in Business

* Jointly offered with the Nanyang Business School, with specialisation in Business Analytics
* Jointly offered with the College of Humanities, Arts and Social Sciences
* In collaboration with the Nanyang Business School
I enjoy the structure and rigour of the course that I am pursuing. Although the coursework can be rather demanding at times, the academic journey at SCSE has been made more enjoyable with the helpful classmates and lab assistants as well as the supporting professors who have kept the doors of their offices open for consultations.

Apart from academics, SCSE provides numerous opportunities to stretch our potential in non-academic areas such as leadership and communication. For instance, I was privileged to be one of the 24 students chosen for NTU’s pioneer Student Leadership Development Programme. We were given the opportunity to network with successful corporate leaders and implement a real-life and socially-relevant project in this 6-month long programme. This experience left a deep impression on me and impacted me positively.

In a nutshell, my experience at SCSE has been an engaging, enjoyable and challenging one!

SCSE alumnus, Mr Leo Chen is the co-founder and Chief Executive Officer of Jumei.com, the first China-based cosmetics group-buying site. He joined the ranks of the world’s billionaires after Jumei’s listing at the New York Stock Exchange in May 2014. Mr Chen’s remarkable success in co-founding a billion dollar business empire also made him into Forbes China’s “30 Under 30” – a list of notable entrepreneurs under the age of 30 – in both 2012 and 2013.