Materials for Today’s Industry and the Future Economy

School of Materials Science and Engineering

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BEGIN YOUR AMAZING JOURNEY WITH MSE TODAY!

Materials Science and Engineering (MSE) 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 industry needs. You will be engineering revolutionary materials that push the frontiers of science.

INTERNATIONALLY RENOWNED FACULTY

MSE leverages on the depth and breadth of our talent pool of globally recognised professors. Our professors constantly strive to apply industry relevance to our courses.

PROFESSOR LEE POOI SEE
• TechConnect Innovation Award (2015)
• Nanyang Research Award (2015)
• NRF Investigatorship (2015)
• National Day Award (2014)
• The Public Administration Medal (Bronze) (2014)

PROFESSOR ALI GILLES
• Singapore Maritime Institute (SMI) Award for Achievement in Research Excellence (2017)
• Singapore Maritime Institute (SMI) Top Project (2015)

PROFESSOR NRI PAN MATHEWS
• Nanyang Outstanding Young Alumni Award (2016)
• Young Scientist Award (2015)
• Nanyang Research Excellence Award (2014)

Our degree is recognised worldwide and accredited by the Engineering Accreditation Board (EAB)
CAREER PROSPECTS

MSE graduates are highly sought after across a broad spectrum of key industries such as Aerospace, Aviation, Biomedical, Defence, Education, Electronics, Engineering, Fast Moving Consumer Goods, Manufacturing, Offshore & Marine, Oil & Gas, Pharmaceutical, Renewable Energy, Research and Technology. We are proud to share that many of our graduates have fully embraced the innovation culture and moved on to become trailblazing and successful entrepreneurs.
**CURRICULUM**

Drawing reference from the Singapore Government’s Industry Transformation Maps, MSE offers **four specialisations** in the growth areas of:

- Industrial Materials Engineering
- Innovation and Intellectual Property
- Medical Materials
- Nanoscience and Nanotechnology

To help our graduates accelerate career opportunities in sunrise industries, we also offer **second major** options in:

- Medical Biology
- Pharmaceutical Engineering

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**PROGRAMMES OFFERED**

- Bachelor of Engineering in Materials Engineering
- Bachelor of Engineering in Materials Engineering with a Second Major in Business
- Bachelor of Engineering in Materials Engineering with a Second Major in Medical Biology
- Bachelor of Engineering in Materials Engineering with a Second Major in Pharmaceutical Engineering
- Double Degree in Bachelor of Engineering (Materials Engineering) and Bachelor of Arts (Economics)

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**YEAR 1**

- FE1008 Computing
- GC0001 Introduction to Sustainability: Multidisciplinary Approaches & Solutions
- HW0001 English Proficiency
- MH1810 Mathematics I
- ML0001 Absolute Basics for Career
- MS1012 Materials Physics
- MS1013 Materials Chemistry
- MS1014 Materials Chemistry II
- MS1015 Materials Science
- MS1016 Thermodynamics of Materials
- PH1011 Physics

**YEAR 2**

- HW0188 Engineering Communication I
- HY0001 Ethics & Moral Reasoning
- MS2012 Introduction to Manufacturing Processes
- MS2013 Polymers & Composites
- MS2014 Materials Structure & Defects
- MS2015 Mechanical Behaviour of Materials
- MS2016 Phase Transformation & Kinetics
- MS2018 Electronic & Magnetic Properties of Materials
- MS2081 Laboratory IIA
- MS2082 Laboratory IIB
- MH2811 Mathematics II

**YEAR 3**

- ET0001 Enterprise & Innovation
- HW0288 Engineering Communication II
- ML0002 Career Power Up!
- MS3011 Metallic & Ceramic Materials
- MS3012 Polymer & Composites
- MS3013 Mechanical Behaviour of Materials
- MS3014 Phase Transformation & Kinetics
- MS3015 Electronic & Magnetic Properties of Materials
- MS3081 Laboratory II
- MS3099 Professional Internship

**YEAR 4**

- MS3002 Engineers & Society
- MS4012 Quality Control
- MS4013 Biomaterials
- MS4014 Nanomaterials: Fundamentals & Applications
- MS4089 Final Year Project
ALUMNI & INDUSTRY RELEVANCE

Materials is at the forefront of all industries.

With MSE standing at the frontier of groundbreaking research and innovation led by an international team of world-class faculty members, you can expect a modern science-driven and application-oriented education that prepares you for today’s industry and the future economy.

In 2001, I joined my father’s solar panel manufacturing business, Sunseap Enterprises, as a fresh graduate with a degree in materials engineering from NTU.

Fast forward to today, I am pleased to share that the Sunseap Group has expanded tremendously and is involved in several landmark solar projects in Singapore, such as the 9.5-megawatt facility at the Jurong Port. The rooftop installation is the world’s largest port-based solar energy facility.

In addition, we have successfully inked a landmark arrangement to supply clean energy for Apple in South Asia under a long-term contract beginning January 2016. The deal makes Apple the first company to be powered by 100% renewable energy in Singapore.

The NTU MSE education has equipped me with a robust technical foundation, coupled with essential life skills, and these have propelled my entrepreneurial success at Hydroemission.

At Hydroemission, we solve the most demanding problems through materials science and innovation. As a global player in the exciting and important field of controlled release technology for environmental applications, our leading-edge product design, technology and R&D are driven by an industrious effort to be sustainable and responsible.

I am proud to share that Hydroemission is the winner of the Emerging Enterprise Best Innovation Award (2011) and the Singapore Environmental Achievement Award for Green Innovation Award (2012 & 2017).

I am deeply grateful for the diverse and amazing opportunities received during my 4 years of studies at MSE. Besides having the honour to serve as the President of the MSE Club, I was also given the privilege to represent NTU as her only undergraduate representative at the ASEAN+3 Young Speaker’s Competition. Held annually across various ASEAN countries, this prestigious competition aims to deepen the level of cooperation amongst the region’s next generation of leaders – ASEAN+3’s (including China, South Korea and Japan).

One of my greatest takeaways was the opportunity to make long-lasting friendships and build camaraderie with like-minded youth leaders across the region. My efforts have paid off and I emerged as the runner-up amongst intense competition. In addition, this enriching experience provided a global platform where I could learn from great speakers, contribute my perspectives and improve my stage confidence.

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 that are pivotal for career success. 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.

My time here at MSE has brought me two prestigious achievements which I hold close to my heart; the National Youth Achievement Award (NYAA) Singapore Gold Award (2015) and the Institution of Engineers Singapore (IES-SG50) Golden Jubilee Scholarship (2016).

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 MSE has been a fruitful, enjoyable and extraordinary one!
HOLISTIC STUDENT LIFE

MUTIARA DINANTI SIREGAR

- Samsung Solve for Tomorrow Challenge (2015)
- Decarbonathon Competition by ENGIE Paris (2016)
- Schneider Electric – Go Green in the City Competition (2016)
- P&G CEO Challenge (2016)
- Vatican Youth Symposium by the UN Sustainable Development Solutions Network (2016)
- P&G Tech Challenge (2017)

MATTHEW TAN WEI MING

- NTU Academic Dean’s List (2015 & 2016)
- Overseas Student Exchange Programme at the Technical University of Denmark (2017)
- Singapore-MIT Undergraduate Research Fellowship (2017)
- NTU President Research Scholar (Distinction) for the Undergraduate Research Experience on Campus (URECA) (2016)
- Co-founder and Chairman of the MSE Local Community Involvement Project (2016 & 2017)

HAW JIE KANG

As the Chairperson of the Transition & Orientation Programme, I learnt to be more adept at managing interpersonal relationships.

I am also grateful for the international experience and generous travel grant support from MSE, which gave me the opportunity to embark on a semester-long student exchange programme at KTH Royal Institute of Technology in Stockholm, Sweden.

LEE WEN DI

In the past four years, MSE offered me with a cornucopia of opportunities. I pursued medical materials research and further explored this area through mock trials on medical complications, visits to hospital sites and critical reviews of scientific articles during my exchange programme in Sweden.

Under the MSE Leadership Excellence Programme (LEP), I travelled around the world, where I engaged in discussions about humanitarian affairs in Hong Kong and immersed in the science and technological development in Japan. In addition, I led a team to volunteer in the Philippines and this opened my heart and eyes to the plight of the less fortunate.

Having participated in a wide range of activities organised by the MSE Club, I forged precious friendships. I have grown a lot through these experiences, not solely in the academic sense, but more of my perspectives – how I view the world and learn to be more empathetic. MSE has provided a conducive environment for me to grow, to be challenged and to learn to accept that failures are part of the growth process. Our professors are extremely approachable and are always willing to give their advice whenever I need help or a listening ear.

We are committed to nurture holistic and well-rounded future leaders. The MSE Leadership Excellence Programme (LEP) is our signature offering which provides students with additional development opportunities to realise their fullest potential. Selected students enrolled in this programme will undertake specialised training in character building, management and communication skills, and more. Through exclusive industry networking sessions, they can also build influential connections and gain valuable insights into the business world and industry.

MELISSA TAN SIEW TING

MSE’s curriculum prepared me well for competitive internships in A*STAR and the University of California, San Diego. I am delighted to share that I have received prestigious PhD offers from MIT as well as Stanford University.

Beyond intellectual rigour, MSE has generously provided ample opportunities for my personal growth. Through MSE’s Leadership Excellence Programme (LEP), I have honed my communication and leadership skills, and represented NTU at the prestigious 8th University Scholars Leadership Symposium. It was a truly transformative experience as I collaborated with outstanding global student leaders.

MSE fully supports and encourages her students to develop global exposure, in which I got to spend one semester on exchange at the McGill University in Canada.
In clockwise direction:
MSE undergraduates: Arumugham Akshaya, Tey Zhi Huey, Gabriel Lim Jun Jee, Lucas Cheong How Min and
Professor Joachim Loo (Associate Chair of Students)