NUS National University of Singapore

新加坡国立大学

本硕联合 (3+1+1) 项目简介
（化学与生物分子工程专业）

腾讯会议：565-583-873
https://meeting.tencent.com/dm/R9ZGp9ssoqyJ

Wednesday

20 Nov 2024

07-8:30 PM PM

内容

- 新加坡国立大学及化工系简介
- 3+1+1联合硕士项目简介

Reasons to Choose
新加坡国立大学

NUS

8th In the world | **1st** in Asia

QS World University Rankings 2025

VISION

a leading global university
shaping the future

MISSION

to educate, inspire
and transform

VALUES

innovation, resilience
excellence, respect, integrity

The National University of Singapore aspires to be a vital community of academics, researchers, staff, students and alumni working together in a spirit of innovation and enterprise for a better world.

Our singular focus on talent is the cornerstone of a truly great university that is dedicated to quality education, influential research and visionary enterprise, in service of country and society.

Empowering Minds, Building Futures:
Uniting World-Class Education with Endless Possibilities

NUS
National University
of Singapore

Singapore's flagship university

We are dedicated to **quality education**, **influential research**, and **visionary enterprise**, in service of the country and society.

Founded by the community for the community

Established in 1905 as a medical school to serve the local community

Championed by Straits-born merchant and community leader Tan Jiak Kim and a group of local businessmen

16 Colleges, faculties and schools which offer multiple education pathways to maximise student potential.

Our distinctive global programmes

- NUS Overseas Colleges
- Student exchange and internships
- **>70** double, joint and concurrent degrees with top universities

>15 NUS Overseas Colleges entrepreneurial hubs around the world

NUS National University of Singapore

North America	Europe & Middle East	China	North Asia	Southeast Asia
New York	Munich	Beijing	Nagoya*	Bandung
Silicon Valley	Paris*	Chongqing*		Ho Chi Minh City
Toronto	Stockholm	Guangzhou*		Jakarta
	Tel Aviv	Shanghai		Singapore
	Herzliya	Shenzhen		Yogyakarta
	Haifa			

>850 start-ups founded by NOC alumni

>US$800 million raised by NOC alumni start-ups,

3% of total funding raised by start-ups in Singapore.

As at Dec 2020


>300 partner universities
in 40+ countries for
student exchange experiences
Student Exchange Programme
Explore new vistas on the Student Exchange Programme.

Continuing and Lifelong Education

- **Opportunities for adult learners**
- **Acquire new knowledge and update work skills**
- **Support Singapore’s manpower needs**

NUS Research

Advancing knowledge and pioneering discoveries

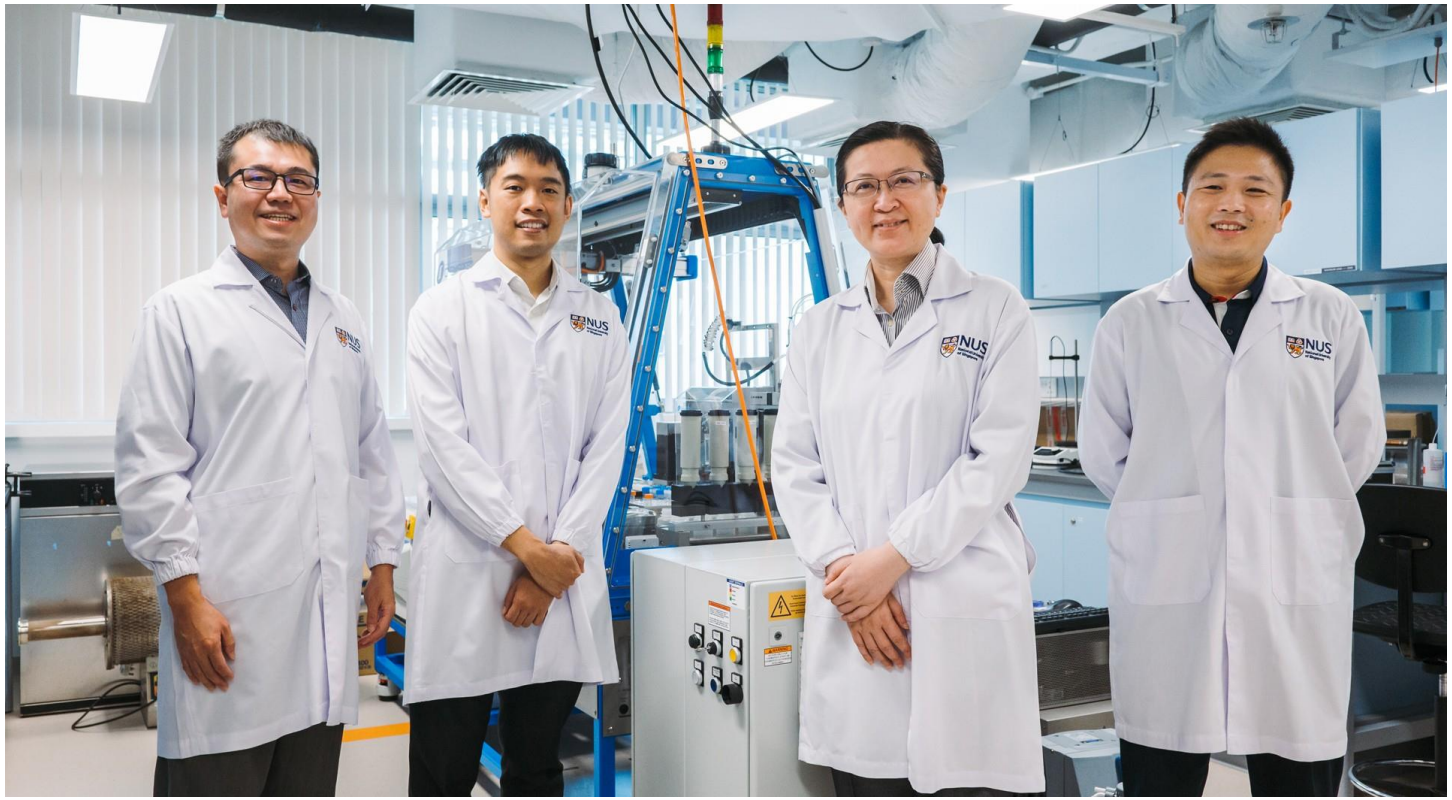
Deploying research for industry transformation

Catalysing impactful enterprise

Research Centres of Excellence

Research Institutes & Centres

Corporate Laboratories



Key Areas


Ageing
Asian Studies
Biomedical Sciences & Translational Medicine
Finance & Risk Management
Integrative Sustainability Solutions
Maritime
Materials Science
Smart Nation
8
Research Clusters

SUBJECTS	2024
Architecture/ Built Environment	#5
Business & Management Studies	#10
Chemical Engineering	**#5**
Chemistry	#7
Civil & Structural Engineering	#4
Computer Science & Information Systems	#6
Data Science & Artificial Intelligence	#6
Development Studies	#9
Electrical & Electronic Engineering	#6
Environmental Sciences	#9
Geography	#6
History of Art	#2
Linguistics	#9
Marketing	#8
Materials Science	#8
Mathematics	#10
Mechanical, Aeronautical & Manufacturing Engineering	#7
Social Policy & Administration	#6
Statistics & Operational Research	#10

NUS National University of Singapore

Chemical&Biomolecular Engineering

World's Top Five and Asia's Best in Chemical Engineering

VISION

A world-leading academic program
in chemical engineering education and innovation.

MISSION

To nurture creative chemical engineer leaders
and innovate for a sustainable future

our community

NUS National University of Singapore

Current students *(as of 2024)*

706 Undergraduate Students
653 Graduate Students

Class of 2024

227 BEng degrees
236 MSc degrees
15 MEng degrees
31 PhD degrees

Staff Population *(as of 2024)*

35 Tenure Track Faculty
10 Educator & Practice Track Faculty
20 Adjunct Faculty
158 Research Staff
17 Laboratory Staff
12 Administrative Staff

our core competencies

NUS National University of Singapore

Chemical Engineering Sciences

Advanced Manufacturing Processes

Clean Energy & Water

Chemical Product Design

Advanced Materials & Formulations

Biomolecular & Cellular Engineering

Multi-scale Functional Materials Design

Advanced Manufacturing

Chemical & Biological Materials

Data Information Automation & Systems

Information Intelligence & Systems

our strategic thrusts

- Top University in Water Reuse
- Top University in Membrane Research
- Top University in Desalination Research
- Top 40 Universities in Water Research
- Top Academic in Global Water Research

Clean Energy and Water

- **Natural Gas Production:** offshore production, gas hydrates
- **Gas Separation:** adsorbent materials and processes, compact systems
- **Transport:** LNG, SNG, ANG
- **Utilization:** cold energy from LNG, C1-C2 chemistry
- **Membrane Science & Technology:** for water, energy and environment

our strategic thrusts

NUS National University of Singapore

Advanced (Chemical, Biological & Materials) Manufacturing

- Waste and biomass valorization to fuels and high value chemicals
- Cellular/metabolic engineering and bioprocess technology
- Continuous (bio)pharmaceutical manufacturing
- Heterogeneous catalysis and biocatalysis
- Flow chemistry, process intensification and microchemical systems

our strategic thrusts

Chemical Product Design – Advanced Materials & Formulations

- Self assembled colloidal and nanomaterials for drug delivery
- Stimulus responsive surfaces, soft materials and formulations
- Pharmaceutical crystallization and drug product design
- Luminescent and 2D materials, metallic nanomaterials and metal-organic frameworks for separations, sensing and diagnostics
- Microfluidics and lab-on-a-chip systems

NUS National University of Singapore

our strategic thrusts

Information, Intelligence and Systems

- Big data and machine learning: healthcare and smart cities
- Multi-scale process systems modeling and optimization
- Molecular modeling and simulation
- Logistics and supply chain modeling
- Innovative pedagogy of machine learning and artificial intelligence

NUS National University of Singapore

our new startups

NUS National University of Singapore

MEMBRANE

Seppure Pte Ltd
NUSGRIP
Neal Chung
Mohd Farahani
Nanofiltration membranes

BlueOcean Memtech Pte Ltd
Neal Chung
Sui Zhang
Water treatment

GENERATION START UP

ENERGY

Singfilm Solar Pte Ltd
Yi Hou
Solar Cells

E2S2 Systems Pte Ltd
Yen Wah Tong
From food waste to energy

NewGen Gas Pte Ltd
NUSGRIP
Praveen Linga
Maninder Khurana
Cheaper fuel storage

Biocycle Pte Ltd
Zhi Li
Biocatalysis

BIOTECH

Luminicell Pte Ltd
Bin Liu
Next generation cell trackers

TuSense Pte Ltd
NUSGRIP
David Leong
Suresh Govindarajan
Non-invasive devices for respiratory diagnosis

Wolfcreek Biotech Pte Ltd
Saif Khan
Sustained drug delivery

NANO

Matralix Pte Ltd
Saif Khan
Lipid-based microencapsulation

TechTrove Pte Ltd
Dan Zhao
Handheld explosive material detector

NUSGRIP
Nanolumi Pte Ltd
Jeffrey Lee

NUSGRIP
Prognoix Pte Ltd
Abhinav Jain

our new initiatives

NUS National University of Singapore

Cambridge Centre for Carbon Reduction in Chemical Technology

2014

NanoNASH Program

2019

NUS Flagship Green Energy Program

2018

Decarbonization

2021

Pharmaceutical Innovation Program Singapore

2018

Centre for Hydrogen Innovations

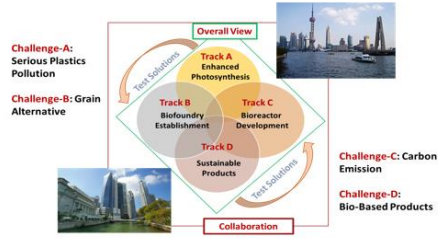
2022

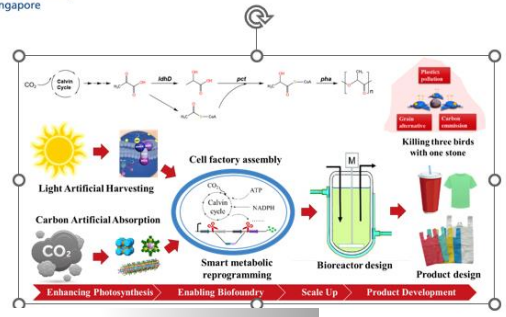
CNSB CREATE — Carbon Negative Synthetic Biology for Biomaterial Production from CO_2

NUS National University of Singapore

CREATE Campus for Research Excellence And Technological Enterprise

National Research Foundation Prime Minister's Office Singapore





2024 **SJTU Asia-Pacific Graduate Institute LTD.**

E2S2 CREATE — Energy and Environmental Sustainability Solutions for Megacities

SGMEM Singapore Membrane Consortium

SINGAPORE ENERGY CENTRE

our passionate researchers

NUS National University of Singapore

2020 - 2023 Clarivate Analytics Highly Cited Researchers

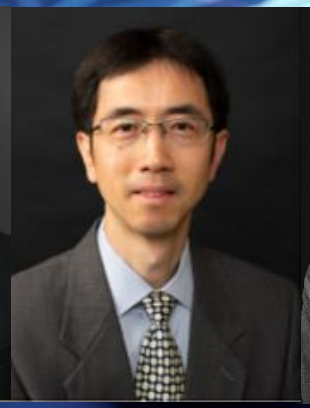
Ranked in the top 1% by citations for field and publication year in Web of Science,
our Highly Cited Researchers are leading the way in solving the world's biggest challenges.

90 in Singapore 2021	32 in NUS	3 in ChBE

106 in Singapore 2023	45 in NUS	8 in ChBE

Chen XY, Shawn
Chemistry
2023

Wang Chi-Hwa
Cross-Field
2023



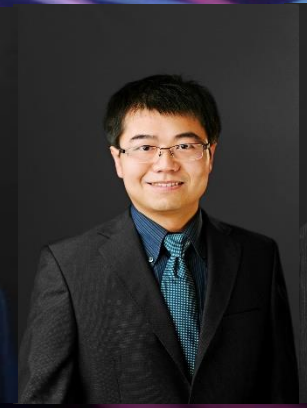
Zhiqun Lin
Chemistry
2022 & 2023

Bin Liu
Cross-Field
2020, 2021, 2022 & 2023

Jianping Xie
Chemistry
2020,2021, 2022 & 2023

Sibudjing Kawi
Cross-Field
2022 & 2023

Hou Yi
Cross-Field
2022 & 2023



Ning Yan
Cross-Field
2023

Dan Zhao
Cross-Field
2020

Source: Clarivate Analytics' 2019-2023 List of World's Highly Cited Researchers

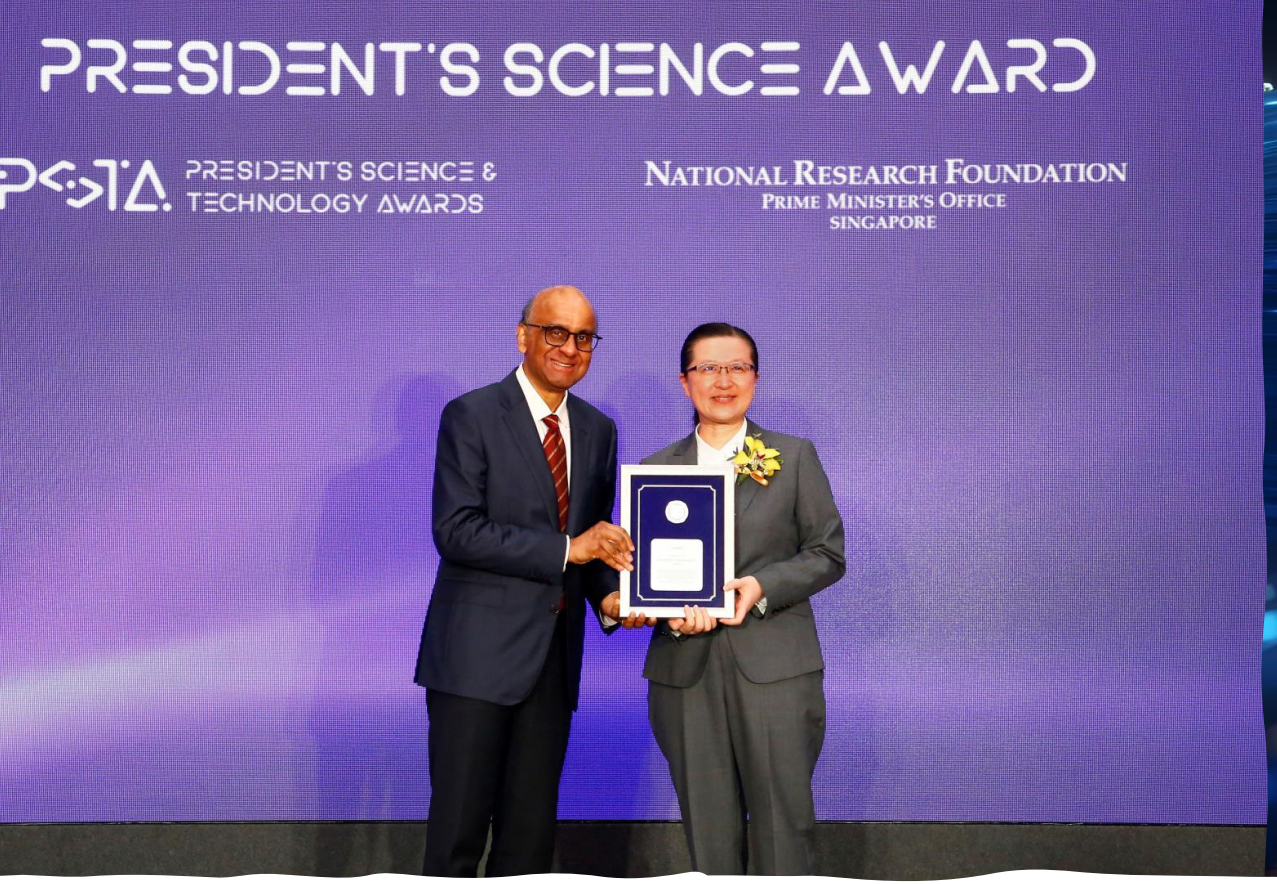
our award-winning educators

Teaching awards 2024

Dr Suraj Vasudevan

Annual Teaching Excellence Award &
ATEA Honour Roll 2024

NUS National University of Singapore



NATIONAL HONOURS FOR RESEARCH EXCELLENCE

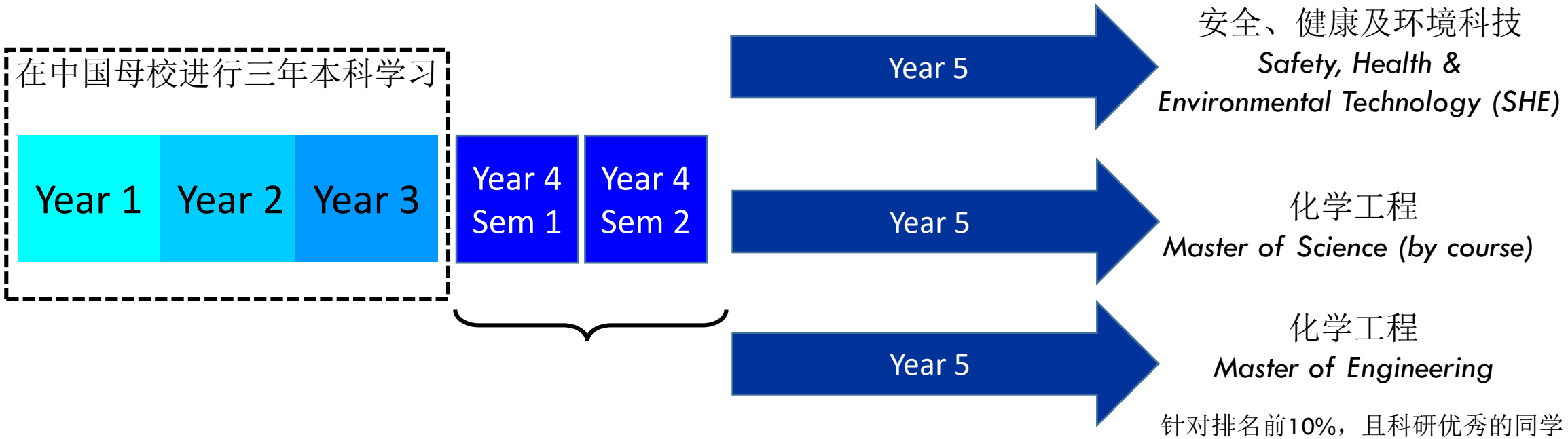
At a ceremony held on 27 September 2024, President of Singapore Tharman Shanmugaratnam presented the President's Science Award to Professor Liu Bin, Tan Chin Tuan Centennial Professor as well as Deputy President (Research and Technology) at NUS. The PSA recognises accomplishments generally acknowledged by other Science and Technology (S&T) practitioners as being significant and impactful to their field. She is the first female individual winner of the President's Science Award. Prof Liu also made history in 2016 as the first female individual winner of the President's Technology Award.

内容

- 新加坡国立大学及化工系简介
- **3+1+1联合硕士项目简介**

硕士预科 (3+1+1) 项目

本科学位 （中国母校）	硕士学位 （新加坡国立大学）



新加坡国立大学
一年期衔接课程
四门选修课+毕业论文

新加坡国立大学
化学与生物分子工程系
一年硕士课程

安全、健康及环境科技 MSc SHE

Master of Science in

Safety, Health & Environmental Technology

Specialization in

Process Safety, Industrial Hygiene

SIN Siang-Meng, Ivan
Associate Professor & Programme Chair
E: chessmi@nus.edu.sg

核心培养目标

培养化工及其他行业中所需的安全、健康、环境专业人才；

面向工业4.0的需求，培养SHE相关行业的未来领导者

化学工程 MSc ChemEng

Master of Science in
Chemical Engineering

LIM Eldin Wee Chuan
Associate Professor &
Programme Chair
E: chelwce@nus.edu.sg

核心培养目标

培养化工及相关行业中的高级工程师及其他方面团队核心人才或领导者；

在本科教育基础上，从多方面对学生进行全面提升，增加竞争力、就业面，拓宽未来的选择

为有志于从事学术研究的学生打下坚实的基础

化学工程 MEng ChemEng

Master of Engineering in Chemical Engineering

LIM Eldin Wee Chuan
Associate Professor & Programme Chair
E: chelwce@nus.edu.sg

核心培养目标

培养化工及相关行业中的研究型人才；为有志于从事学术研究的学生打下坚实的基础

针对排名前10%，且科研优秀的同学

“3+1+1联合本硕”项目预定时间表

24年 11月	线上宣讲会
24年11月- 25年1月	合作大学推荐本校大三学生，由新加坡国大选拔工作组进行甄选和面试
25年2-3月	新加坡国立大学通知入选学生完成衔接课程（大四本科）的正式申请
25年5-6月	新加坡国立大学通知入选学生完成网上入学注册，申请交流签证
25年8月	开始第一学期衔接课程@新加坡国立大学
25年12-26年3月	申请新加坡国立大学化学工程系硕士项目
26年5-6月	发放课程硕士录取通知书，学生完成网上入学注册，并申请签证
26年8月	正式开始硕士阶段学习
27年6月	顺利毕业后，领取硕士学位

第四年推荐课程设置

MSc (Chemical Engineering) / (Safety, Health & Environmental Technology)	
第一学期	1. 完成母校专属要求 2. 完成12学分
第二学期	1. 完成母校专属要求 2. 完成12学分

MEng (Chemical Engineering)	
第一学期	1. 完成母校专属要求 2. 完成8学分 3. 开展实验室研究
第二学期	1. 完成母校专属要求 2. 完成8学分 3. 开展实验室研究

针对排名前10%，且科研优秀的同学

大四衔接课程可选修科目

Module code and title		Modular Credits
CN4118N	Capstone Research Project (compulsory course) 顶点研究项目（必修课程）	8
CN4122N	Process Synthesis and Simulation (compulsory course) 系统过程综合与模拟（必修课程）	4
CN4201R	Petroleum Refining石油炼制	4
CN4203R	Polymer Engineering高石油炼制分子工程	4
CN4205R	Pinch Analysis and Process Integration夹点分析与过程集成	4
CN4211R	Petrochemicals and Processing Technologies石油化工及加工技术	4
CN4215R	Food Technology and Engineering食品技术与工程	4
CN4216R	Electronic Materials Science电子材料科学	4
CN4218	Particle Technology Fundamentals and Applications 粒子技术基础与应用	4
CN4221R	Control of Industrial Processes工业过程控制	4
CN4227R	Advanced Process Control先进过程控制	4
CN4238R	Chemical & Biochemical Process Modelling化学和生化过程建模	4
CN4240R	Unit Operations and Processes for Effluent Treatment 污水处理单元操作和工艺	4
CN4246R	Chemical and Bio-Catalysis化学和生物催化	4
CN4247R	Enzyme Technology酶技术	4
CN4248	Sustainable Process Development可持续过程发展	4
CN4250	Chemical Product Design化工产品设计	4
CN4251	Troubleshooting with Case Studies for Process Engineers 过程工程师的故障排除和案例研究	4

也可以按照规定选修研究生课程（5开头），并将8个学分带到研究生阶段

大四衔接课程可选修科目

Module code and title		Modular Credits
CN5010	Mathematical & Computing Methods for Chemical Engineers 化工工程数学计算方法	4
CN5020	Advanced Reaction Engineering 高等反应工程	4
CN5030	Advanced Chemical Engineering Thermodynamics 高等化工热力学	4
CN5040	Advanced Transport Phenomena 高等传输现象	4
CN5050	Advanced Separation Processes 高等分离工程	4
CN5172	Biochemical Engineering 生物化学工程	4
CN5111	Optimization of Chemical Processes 化工过程优化	4
CN5160	Advanced Topics in Catalysis 高等催化	4
CN5161	Polymer Processing Engineering 高分子加工工程	
CN5162	Advanced Polymeric Materials 先进高分子材料	4
CN5173	Downstream Processing of Biochemical and Pharmaceutical Products 生化药品下游加工	4
CN5190	Hydrogen Energy and Technology 氢气能源与技术	4
CN5191	Project Engineering 项目工程	4
CN5192	Future Fuel Options: Prospects and Technologies 未来燃料选择：前景和技术	4
CN5193	Instrumental Methods of Analysis 仪器分析	4
CN5215	Atomistic Modelling of Molecules and Materials 分子和材料的原子模拟	4
CN5251	Membrane Science and Technology 薄膜科技	4
CN5252	Metabolic Engineering 代谢工程	4

也可以按照规定选修研究生课程（5开头），并将8个学分带到研究生阶段

大四衔接课程可选修科目

Module code and title		Modular Credits
SH5002	Fundamentals in Industrial Safety工业安全基础	4
SH5003	Fundamentals in Environmental Protection环境保护基础	4
SH5101	Industrial Toxicology工业毒理学	4
SH5102	Occupational Ergonomics职业人因工程	4
SH5104	Occupational Health职业卫生	4
SH5105	Noise and Other Physical Hazards噪音和其他物理危害	4
SH5106	Radiation辐射	4
SH5107	Industrial Ventilation工业通风	4
SH5108	Chemical Hazard Management化学危害管理	4
SH5109	Biostatistics and Epidemiology生物统计学和流行病学	4
SH5110	Chemical Hazard Evaluation化学危险性评价	4
SH5201	Hazard Identification and Evaluation危险源辨识与评价	4
SH5202	Quantified Risk Analysis量化风险分析	4
SH5203	Emergency Planning应急计划	4
SH5204	Safety Engineering安全工程	4
SH5206	Human Factors in Process Safety过程安全的人为因素	4
SH5401	SHE and Quality Management Systems 安全卫生与环境科技和质量管理体系	4
SH5402	Advanced SHE Management 高等安全卫生与环境科技管理	4
SH5404	Safety Health and Environmental Project 安全健康与环境研究项目	4

也可以按照规定选修研究生课程（5开头），并将8个学分带到研究生阶段

硕士班录取资格

1. 本科毕业成绩平均分 75 以上

2. 在新加坡国立大学完成 4 门选修课和毕业论文，平均分 B 或 GPA 3.5 以上 （总分 5.0）

3. 英语要求 (任选其一)：

- 托福成绩85分以上 (写作部分22分以上)
- 雅思成绩总分6分以上

学期与授课时数

One Year has two semesters （一年 2 学期）

- Each semester has 13 teaching weeks（13 周授课）
  - SEMESTER 1: AUG-DEC
  - SEMESTER 2: JAN-MAY

A typical module is 4 MC （1科平均4学分）

- 3 hours of lecture and 1 hour tutorial（一周3小时讲课+1小时辅导课）

大班讲课（Lecture）

小班辅导课（Tutorial Class）

实验课（Laboratory）

实践体验课

毕业要求

MSc (Chemical Engineering)

1. 完成 40 学分
2. GPA 3.0 以上 （总分5.0）
3. 最多两门课程（8学分）可从第一个+1（大四交流）带到第二个 +1（硕士阶段）(CN5)

MEng (Chemical Engineering)

1. 完成 16 学分
2. 完成研究口头报告
3. 完成硕士论文
2. 最多一门课程（4学分）可从第一个+1（大四交流）带到第二个 +1（硕士阶段）

对于有心科研读博的同学，强烈建议选修CN5555，化工科研（8学分）

MSc (Safety, Health & Environmental Technology)

MSc (SHE) Degree	MSc (SHE) Degree with Industrial Hygiene Specialization	MSc (SHE) Degree with Process Safety Specialization
1. 完成至少三门Industrial Hygiene 选修课 2. 完成至少三门Process Safety选修课 3. 再完成至少两门Industrial Hygiene, Process Safety or General选修课	1. 完成至少六门Industrial Hygiene 选修课 2. 完成至少两门Process Safety选修课	1. 完成至少六门Process Safety选修课 2. 完成至少两门Industrial Hygiene 选修课

Any remaining modules from part (i) Industrial Hygiene Elective Modules, (ii) Process Safety Elective Modules, (iii) General Elective Modules, and up to 2 other modules subjected to the approval of the Department.

对于SHE，最多两门课程（8学分）可从第一个+1（大四交流）带到第二个 +1（硕士阶段）(CN5)

预计学杂费及生活费

大四

1. 选修课&论文&杂费： 约S$ 20,000
2. 预计生活费： S$ 12,000

约 ￥16 万人民币

硕一

1. 学费： 约S$ 49,000
2. 预计生活费： S$ 12,000

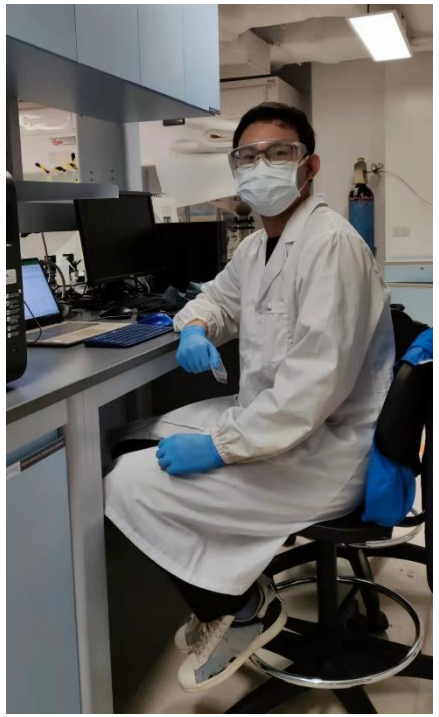
约 ￥35万人民币

生活费仅供参考，最终学费以NUS官方宣布为准

项目优势

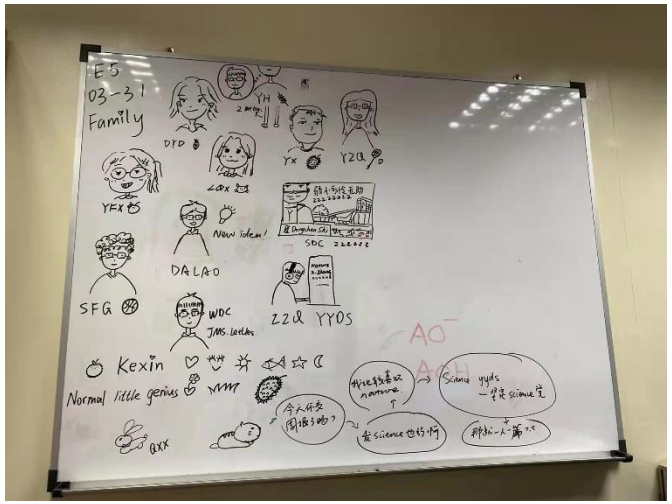
1. 提前预定未来
2. 更好计划未来
3. 降低花费
4. 第一个1年后可自由退出

师兄师姐在NUS等你们



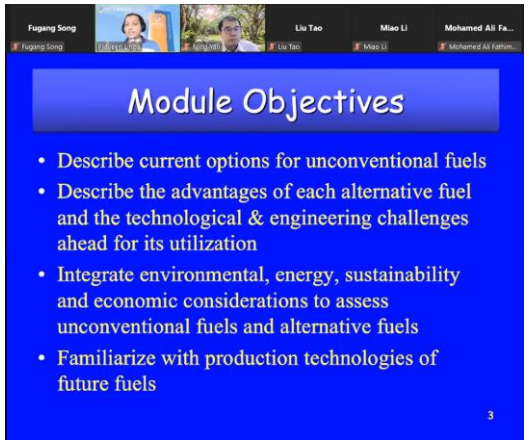
宋府罡

来到NUS，周围都是比自己优秀的人，他们身上有着许多优点可以学习，老师们的学术水平也非常高，也有着一些能力非常强的博后，他们都已经具备着成熟的科研能力，和他们交流对自己今后无论科研还是工作都有很大的帮助。



温馨的组内氛围

闲暇的外出娱乐



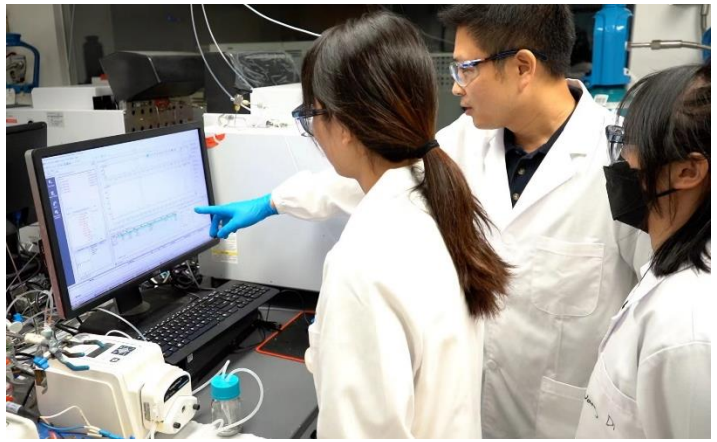
疫情的线上课程

宜人的自然环境

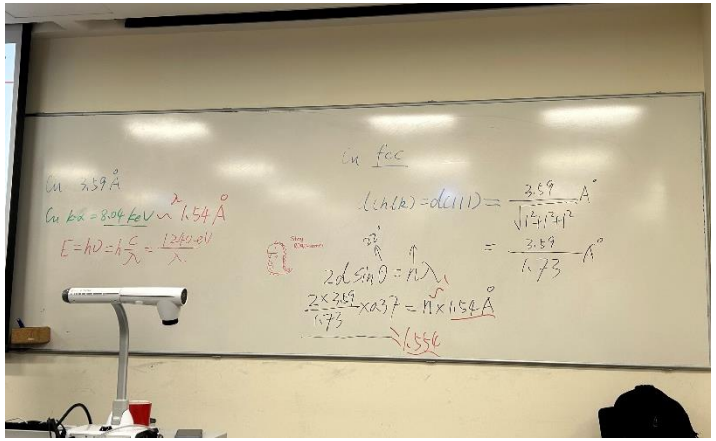
师兄师姐在NUS等你们

温馨的组内氛围

闲暇的外出娱乐



悉心的导师栽培



充实的线下课程

完备的实验条件

宜人的自然环境

师兄师姐在NUS等你们

学弟学妹们好，我是陈郁竹，申请了新加坡国立大学的3+1+1项目。在这顶尖学府，加入了温馨的实验室大家庭，学习到了很多新的知识，认识了一群优秀的小伙伴，收获满满。新加坡风景优美，与不同文化背景的人相处，极大开阔了我的视野，带给了我全新的生活体验。

欢迎大家加入我们，有空一起去西海岸看日落呀~

学弟学妹们好，我是杨佳衡，很高兴能来到NUS这样一所学术科研能力雄厚的顶级学府学习。在这段时间内，导师耐心地对我进行指导，在短时间内学习领域内的基本知识。同时，身边优秀的师兄师姐也给予了我们很多帮助。他们不但教会了我如何细致地阅读文献、严谨地进行实验，还会关心我们的学习生活是否顺利。欢迎大家的加入！

师兄师姐在NUS等你们

学弟学妹们好，我是周一凡。在NUS学习的这段时间，我最大的感受就是成长和收获。这里的国际化环境让我开阔了眼界，接触到很多优秀的同学和老师，结交到了很多新朋友。NUS的资源非常丰富，无论是职业发展还是研究学习，都有很多机会。希望你们也能在这里找到属于自己的方向，不断挑战自己，收获成长，探索人生！

学弟学妹们好，我是李梦涵。非常幸运能通过3+1+1这个项目加入到新加坡国立大学。在这期间我不但收获了丰富的专业知识，也体验了多彩的异国文化生活。非常期待能在这里遇到你们，相信你们也会获得一段宝贵的人生经历。

师兄师姐在NUS等你们

学弟学妹们好，我是吴沛玥，申请了新加坡国立大学的授课型硕士。在这顶尖学府，加入了温馨的实验室大家庭，学习到了很多新的知识，认识了一群优秀的小伙伴，收获满满。新加坡风景优美，四季如夏，是个宜居的好地方。与不同文化背景的人相处，极大开阔了我的视野，带给了我全新的生活体验。

联系方式

wanglei8@nus.edu.sg