

NUS TRANS*formative*
SCIENCE EDUCATION

EMBRACE NUS

Transformative
SCIENCE
EDUCATION

With our holistic and global education, you will develop an inquisitive mind, a “**CAN DO** spirit”, and the ability to “connect” with others. These attributes are highly valued by all employers.

Continue your lifelong learning journey

Advance your life skills

Nurture your professional dreams

Develop your career mobility

Optimise your potential

- 1 Undergraduate Professional Internship Programme
- 2 Undergraduate Research Opportunities Programme in Science
- 3 Special Programme in Science

FINAL YEAR
HONOURS PROJECT

NUS PRE-MEDICAL
PROGRAMME

SUMMER
PROGRAMMES

MINORS

STUDY ABROAD
PROGRAMMES

UROPS²

JOINT DEGREES

DOUBLE DEGREES

DOUBLE MAJORS

SPS³

CONCURRENT
DEGREES

UPIP¹

GLOBAL SCIENCE
PROGRAMMES

Our Faculty has more than 85 years
of experience and expertise in
providing high quality
Science education.

With our comprehensive and flexible curriculum, you can plan
your learning pathways based on your interests and career
aspirations.

Our courses are designed to equip you with domain expertise,
industry-relevant and transferrable skills. You will transform
into an innovative, enterprising and lifelong learner.

MAJORS IN

Life Sciences • Physics • Statistics
Chemistry • Food Science & Technology
Mathematics • Applied Mathematics
Quantitative Finance
Computational Biology • Pharmacy

BIOLOGY
CHEMISTRY

MATHEMATICS
PHYSICS

Chemistry Specialisations: Molecular, and Cell Biology
Life Sciences Specialisations: Molecular, and Cell Biology
Physics Specialisations: Astrophysics, and Quantum Physics
Statistics Specialisations: Biostatistics, Finance and Business Statistics
Applied Mathematics Specialisations: Mathematical Modelling and Data Analytics
Optimisation, Probability and Financial Mathematics



Embrace Lifelong Learning & Scale New Heights

NUS Science graduates are well-equipped with life skills and a “CAN DO spirit”, which will give them the flexibility to move into different careers and remain highly employable.

Our alumni are much sought after as they can easily integrate into new and challenging work environments and are ever ready to contribute to society. They enjoy fulfilling careers in both the public and private sectors. Some became academics while others set up businesses.

Many successful alumni are still seeking to advance their professional growth or self-actualisation in life to enhance their careers and social mobility.

A formal education prepares you with a basic career foundation.

Self-actualisation is a challenging lifelong process. It is like chasing after an elusive rainbow until we find that pot of gold.

A **TRANSFORMATIVE SCIENCE** EDUCATION

provides you with the response-abilities and character to grow continuously, to venture beyond your comfort zone and realise your professional dreams.



We warmly welcome you to embrace our Transformative Science Education and be a member of our Science family and alumni.

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At a Glance

NUS FACULTY OF SCIENCE AT A GLANCE

Distinguished Record

With more than 85 years of experience in providing quality Science education, we are:

- ▶ One of the largest faculties in NUS with 6 departments: Biological Sciences, Chemistry, Mathematics, Pharmacy, Physics, and Statistics and Applied Probability
- ▶ Home to more than 5,000 undergraduates and 1,500 postgraduate students pursuing academic and research excellence
- ▶ One of the best universities in the world for Science education, and ranked by Quacquarelli Symonds [QS] as the top university in Asia for many Science subjects in 2014 and 2015

Science Education at NUS offers:

MYRIAD CHOICES

- ▶ Flexibility for students to plan learning pathways with diverse course choices including 39 undergraduate programmes, 16 minors, several concurrent degree programmes as well as double majors, double degrees, joint degrees, multidisciplinary and cross-faculty programmes
- ▶ Enhancement programmes to broaden students' academic horizon and enterprising outlook, like undergraduate research programmes, local and overseas internships, and inter- and multidisciplinary boutique programmes in Mathematics and Science

Global Outlook

- ▶ Opportunity to enrol in at least one study abroad programme, which develops cultural awareness, resilience, adaptability and independence, with over 70% of Science students participating
- ▶ Globalised university education with over 300 partner universities in 50 countries

Bright Career Prospects

- ▶ Training in specialised domain knowledge as well as important life skills such as critical thinking, problem-solving and interpersonal skills, which offers students an edge in career mobility
- ▶ Bright career opportunities for graduates in diverse high-growth industries that drive Singapore's economy, such as Clean Technology, Consumer Businesses, Education, Financial Services, Infocommunication Technologies, Media and Digital Entertainment, Safety and Security, Biomedical Sciences, and Research & Development

RESEARCH OPPORTUNITIES FOR STUDENTS

Overview

- ▶ The Faculty of Science is home to many different clusters of research excellence, both in fundamental research to create knowledge, and applied research to spur innovation.
- ▶ Apart from the final year project which you are required to or may undertake during your honours year of study, we have various research programmes which offer students opportunities to pursue independent research projects.
- ▶ Through these programmes, students will develop valuable research skills, cultivate critical thinking skills and problem-solving abilities as well as develop communication and presentation skills. Some of these programmes are:
 - The Undergraduate Research Opportunities Programme in Science (UROPS), which allows you in your 2nd or 3rd year of undergraduate study to experience scientific research and discovery through participation in research projects (see page 14)
 - The Special Programme in Science (SPS), which allows you to perform an integrative research project in a team to experience scientific ideas across different fields (see page 14)
 - The Overseas Summer Research Programme, which allows you to go abroad to conduct research in the laboratories of partner universities during the NUS vacation period (see page 16)

Research Institutes and Centres

You may also have opportunities to participate in the activities or research work of some of the research institutes and centres in NUS, which include:

- Centre for Advanced 2D Materials
- Centre for Bioimaging Sciences
- Centre for Ion Beam Applications
- Centre for Quantitative Finance
- Centre for Quantum Technologies
- Centre for Wavelets, Approximation and Information Processing
- Chemical, Molecular and Material Analysis Centre
- Institute for Mathematical Sciences
- Life Sciences Institute
- Mechanobiology Institute
- NUS Environmental Research Institute
- NUS Nanoscience and Nanotechnology Institute
- Protein and Proteomics Centre
- Risk Management Institute
- Singapore Centre on Environmental Life Sciences Engineering
- Singapore Synchrotron Light Source
- Solar Energy Research Institute of Singapore
- Tropical Marine Science Institute

Research Areas within Faculty of Science

BIOLOGICAL SCIENCES

- ▶ Molecular Cell & Developmental Biology: Cell Signalling, Organelles & Cell Biology; Developmental Biology & Fish Biology; Host-Pathogen Interactions & Immunology; Plant Molecular & Developmental Biology; Stem Cell & Cancer Biology
- ▶ Biophysical Sciences: Bioimaging Sciences; Computational Biology; Mechanobiology; Protein Science & Proteomics; Structural Biology
- ▶ Environmental & Evolution Biology: Biodiversity; Ecology; Evolution

CHEMISTRY

- ▶ Advanced Materials: Energy Materials; Graphene & Nanocarbons; Luminescent Biomarkers; Nanomaterials; Organic Optoelectronic Materials
- ▶ Organic Chemistry: Asymmetric Synthesis; Organic Catalysis; Transition Metal Catalysis
- ▶ Chemical Biology & Medicinal Chemistry: Development of Therapeutic Agents; Synthesis of Bioactive Molecules; Synthetic Biology
- ▶ Computational Chemistry, Simulation: Molecular Dynamics; Nanoscale Modelling
- ▶ Environmental Chemistry: CO₂ Fixation; Green Chemistry; Sensors; Water Eco-Efficiency

- ▶ Food Science & Technology: Food Microbiology & Safety; Food Processing & Engineering; Human Nutrition

LEE KONG CHIAN NATURAL HISTORY MUSEUM

- ▶ Biodiversity Research: Conservation of Southeast Asia's Fauna; Natural History; Species Discovery; Systematics; Taxonomy

MATHEMATICS

- ▶ Pure Mathematics: Algebra & Number Theory; Combinatorics & Graph Theory; Dynamical Systems; Geometry & Topology; Mathematical Logic & Theoretical Computer Science; Partial Differential Equations & Geometric Analysis; Probability; Real, Functional & Harmonic Analysis; Representation Theory & Automorphic Forms
- ▶ Applied & Computational Mathematics: Computational Biology & Bioinformatics; Imaging & Vision Science; Mathematical Finance & Mathematical Economics; Numerical Analysis & Scientific Computing; Optimisation

PHARMACY

- ▶ Drug Discovery & Design: Computational Modelling & Informatics; Natural Products & Traditional Chinese Medicine (TCM); Rational Drug Discovery
- ▶ Health Services Research: Clinical Pharmacy & Pharmacy Practice; Disease Control & Management; Pharmacoeconomics

- ▶ Pharmaceutical Biology & Drug Disposition: Disease Etiology, Biomarkers & Targets; Pharmacokinetics; & Pharmacodynamics
- ▶ Pharmaceutical Technology & Innovative Therapeutics: Formulation & Processing; Innovative Nano-Therapeutics; Smart Drug Delivery & Novel Bio-systems

PHYSICS

- ▶ Advanced Materials: 2D Materials; Nanostructures & Energy; Organic Semiconductors; Oxides; Spectroscopies; Surface Science
- ▶ Biological & Soft Matter Physics: Biopolymers; Mechanics of Biomolecules
- ▶ Ion Beam Science & Technology: Proton Beam Writing; Proton Microscopy
- ▶ Theoretical & Computational Physics: Astrophysics & Cosmology; Condensed Matter Physics; Electromagnetics & Acoustics; Nonlinear Dynamics & Complex Systems; Quantum Finance; String Theory
- ▶ Quantum Information Technologies: Cold Atoms & Molecules, Atom & Ion Trapping; Cryptography; Quantum Entanglement & Information Theory; Quantum Optics & Atom-Photon Interaction

STATISTICS AND APPLIED PROBABILITY

- ▶ Applications: Biostatistics; Computational Biology; Environmental Statistics; Financial Statistics; Infectious

Disease Modelling; Networks; Neural Science; Statistical Genetics

- ▶ Statistical Methodology and Probability Theory: Bayesian Inference; Big Data; Empirical Likelihood; Functional Data Analysis; High Dimensional Data Analysis; Longitudinal Data Analysis; Probability; Semi- and Non-Parametric Regression; Survival Analysis

For the latest research news, please visit: www.science.nus.edu.sg/research/research-news

DEPARTMENT OF BIOLOGICAL SCIENCES OUR PROGRAMMES AT A GLANCE

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN LIFE SCIENCES

- ▶ In the foundation year, you will study a set of core topics on Molecular Cell Biology, Genetics and Evolutionary Biology, as well as Statistics and Organic Chemistry.
- ▶ In Years 2 and 3, you can choose to focus on a particular area of Life Sciences or engage broadly across different areas.
- ▶ Honours students can either study towards a general Honours degree or pursue one of these specialisations:
 - *Biomedical Science*: You will learn about human health and disease such as Pharmacology, Toxicology, Drug and Medicine Discovery, Human Physiology, Neurobiology, Immunology, and Infection and Diseases.
 - *Molecular and Cell Biology*: You will learn about the fundamental mechanisms of living organisms and study topics on Protein Structure and Function, Biophysics and Structural Biology, Genomics and Bioinformatics, Microbiology and Biotechnology, and Developmental Biology and Tumour Biology.
 - *Environmental Biology*: You will learn about biodiversity and ecology and their applications towards environmental conservation, and study topics on Plant and Animal Physiology, Life Forms and Function, Evolution and Systematics, Aquatic and Terrestrial Ecology, and Environmental Processes and Conservation.

DOUBLE DEGREE IN LAW – LL.B. (HONS) & LIFE SCIENCES – B.SC. (HONS)

- ▶ Jointly offered with Faculty of Law, the programme covers many critical and controversial areas including biotechnology, bioethics, environmental regulation, forensic science, and the protection of intellectual property.
- ▶ You will learn about the broad connections between law and life sciences and you can acquire broad expertise to occupy a niche position linking up both disciplines.

DOUBLE MAJOR IN LIFE SCIENCES AND PSYCHOLOGY

- ▶ Jointly offered with the Department of Psychology in the Faculty of Arts and Social Sciences, this programme brings together the two disciplines to create a better understanding of psychology with the added technical perspective from life sciences.
- ▶ With proper module planning and academic advice from the respective departments, you can fulfill both sets of Major and 2nd Major requirements without having to extend your candidature beyond the four years required for a single major Honours degree.

For information on 2nd Major and Minor courses offered by the department, please browse the chapter on "Admission Information".

Graduate Programme

M.SC. / PH.D. BY RESEARCH

- ▶ Your research focus can be in any of these areas: Biophysical Sciences; Cell, Molecular & Developmental Biology; and Ecology & Evolutionary Biology.
- ▶ Under Biophysical Sciences, the research areas include Bioimaging and Proteomics.
- ▶ Under Cell, Molecular and Developmental Biology, the research areas include Molecular Biology, Developmental Biology, Functional Genomics, Metabolomics, Stem Cells, as well as Plant Tissue Culture and Plant Molecular Biology.
- ▶ Under Ecology and Evolutionary Biology, the research areas include Biodiversity of the region, Conservation and Sustainable Utilisation.

CONTACT US

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(NUS Life Sciences Undergraduate Programme)

DEPARTMENT OF CHEMISTRY OUR PROGRAMMES AT A GLANCE

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN CHEMISTRY

- ▶ In Years 1 and 2, you will study the core principles of these 4 branches of Chemistry: Analytical, Inorganic, Organic and Physical Chemistry.
- ▶ Honours students can either study towards a general Honours degree or pursue one of these specialisations:
 - *Materials Chemistry*: You will learn about Polymer Chemistry (e.g. Polymer Synthesis, Polymerisation techniques) and Materials Chemistry (e.g. Solid-State Chemistry, Optical, Electrical, Magnetic & Superconductivity properties of Solids, Fabrication Techniques, Fabrication of Devices, Chemistry of Semiconductors).
 - *Medicinal Chemistry*: You will learn about the design and synthesis of compounds as potential drugs, identify their functional groups and interactions with targets, as well as the methods to assay the compounds.
 - *Environment and Energy*: You will learn about (i) the different tools used in sampling and analysing environmental samples, and (ii) concepts of high quality energy generation and energy conversion processes, impacts of energy policies and details of the chemistry and physics underlying the exploitation of some energy resources.
- ▶ Our B.Sc. (Hons) in Chemistry programme is accredited by the Royal Society of Chemistry.

B.SC. (HONS) AND B.SC. IN FOOD SCIENCE & TECHNOLOGY

- ▶ In this boutique programme, you will learn about food safety, new food product development, food processing, and nutrition.
- ▶ Integral to this programme is the Professional Placement Programme, where students are attached to companies in their 3rd year of studies for up to 6 months.
- ▶ Our Food Science & Technology Programme is accredited by the International Union of Food Science and Technology (IUFoST) for meeting the international standards and guidelines for outcome-based academic programmes. It is the only IUFoST-accredited degree in Singapore.

For information on 2nd Major and Minor courses offered by the department, please browse the chapter on "Admission Information".

Graduate Programmes

JOINT M.SC. IN INDUSTRIAL CHEMISTRY

- ▶ Jointly offered with the Faculty of Chemistry of the Technical University of Munich.
- ▶ This programme grooms future leaders in selected areas of technology in the pharmaceutical and chemical industries.

M.SC. BY COURSEWORK

- ▶ Designed for students with either a 3-year or a 4-year degree to pursue a graduate degree in Chemistry.
- ▶ Specialisations are offered in these areas: Analytical Chemistry, Synthetic Chemistry, Materials Chemistry and Medicinal Chemistry.

M.SC. / PH.D. BY RESEARCH

- ▶ Possible research areas include: Analytical Science, Catalysis, Computation, Modelling & Spectroscopy, Food Science & Technology, Inorganic & Organic Chemistry, Materials Science, Medicinal Chemistry, Chemical Biology and Surface Science.

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DEPARTMENT OF MATHEMATICS OUR PROGRAMMES AT A GLANCE

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN MATHEMATICS

- ▶ You will learn fundamental mathematical concepts in areas such as Algebra, Logic, Number Theory and Combinatorics, Real and Complex Analysis, Differential Equations, Geometry and Topology, with a focus on mathematical foundations and fundamental techniques.

B.SC. (HONS) AND B.SC. IN APPLIED MATHEMATICS

- ▶ You will learn about mathematical methods and problem-solving techniques that are applied in areas such as Science, Engineering, Computer Science, and other real-world applications.
- ▶ Honours students can either study towards a general Honours degree or pursue one of these specialisations:
 - *Operations Research and Financial Mathematics:* You will learn about the application of analytical methods and mathematical models to problems that arise in areas such as industrial engineering, operations management and finance.
 - *Mathematical Modelling and Data Analytics:* You will learn about the use of mathematical models and numerical analysis to manage and analyse massive datasets.

B.SC. (HONS) AND B.SC. IN QUANTITATIVE FINANCE

- ▶ In this multidisciplinary course, you will learn about mathematical theory

and applications, statistical tools, computing theory and techniques, financial theory and principles, and core financial products.

DOUBLE DEGREE IN MATHEMATICS/APPLIED MATHEMATICS [B.SC./B.SC. (HONS)] AND COMPUTER SCIENCE [B.COMP. (HONS)]

- ▶ This interdisciplinary course focuses on synergistic areas of Mathematics/ Applied Mathematics and Computer Science. You may specialise either in Algorithms and Computation or in Multimedia Modelling.

DOUBLE MAJOR IN MATHEMATICS/ APPLIED MATHEMATICS & ECONOMICS

- ▶ Jointly offered with the Department of Economics in the Faculty of Arts and Social Sciences (FASS), this programme enables you to further enrich your mathematical studies by learning about the application of mathematical methods in the development of economic theory and analysis.

SPECIAL PROGRAMME IN MATHEMATICS

- ▶ This is designed for a select group of students with a strong passion and aptitude for the mathematical sciences.
- ▶ It consists of specially designed modules in foundational mathematics that will prepare students for graduate programmes and future careers in the mathematical sciences.

For information on 2nd Major and Minor courses offered by the department, please browse the chapter on "Admission Information".

Graduate Programmes

M.SC. IN MATHEMATICS BY COURSEWORK

- ▶ It is designed for Mathematics teachers and other professionals who wish to upgrade their professional skills and qualifications through advanced training in Mathematics.

M.SC. IN QUANTITATIVE FINANCE BY COURSEWORK

- ▶ Jointly offered with Department of Economics in FASS and the Department of Statistics and Applied Probability, this programme enables you to gain advanced knowledge in Quantitative Finance, as well as the implications of the use of quantitative methods in the financial industry.

M.SC. / PH.D. BY RESEARCH

- ▶ Your research will be in a chosen area of pure, applied and financial mathematics.

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DEPARTMENT OF PHARMACY OUR PROGRAMMES AT A GLANCE

Undergraduate Programmes

B.SC. (PHARMACY) (HONS) AND B.SC. (PHARMACY)

- ▶ This 4-year professional programme educates students in all aspects of medicine and its use in disease management.
- ▶ The Pharmacy curriculum is regularly enhanced to prepare its graduates for the challenges of Singapore's evolving pharmacy landscape. You will read topics related to drug discovery, health product development, patient and disease management, health promotion, regulatory science, good practices and more.
- ▶ Our enhanced multidisciplinary curriculum equips you with skills in problem-solving, patient management, innovative research and interprofessional collaborative practice.
- ▶ Graduates may pursue careers in the pharmaceutical industry or seek registration with the Singapore Pharmacy Council to become licensed pharmacists.

Minor in Pharmaceutical Sciences

- ▶ Designed for non-pharmacy registered students, this programme equips you with fundamental knowledge and skills in pharmaceutical sciences, that will supplement your domain knowledge in Science, Engineering or other major disciplines.
- ▶ The skills you acquire could enhance your career mobility in the pharmaceutical and human health-related industries.

Graduate Programmes

M.SC. (PHARMACEUTICAL SCIENCES & TECHNOLOGY) BY COURSEWORK

- ▶ This is designed for prospective students who are already working or aspiring to enter the pharmaceutical industry.
- ▶ You will acquire in-depth knowledge and practical skills for formulation and process manufacturing of chemical and biological drugs into a range of dosage forms.
- ▶ The programme prepares Science, Engineering and Health Sciences graduates for employment in the areas of manufacturing and quality assurance of active pharmaceutical ingredients and/or finished products; regulatory compliance; medication utilisation review; drug registration; quality assurance, and many others.

M.SC. / PH.D. BY RESEARCH

- ▶ This programme requires students with basic degrees in Science, Engineering or health-related disciplines to work on an individual research project.
- ▶ It leads to an M.Sc. or Ph.D. degree. If you wish to pursue a Ph.D. degree, you must pass the 2-part Qualifying Examination within the first 3 semesters upon admission into the graduate programme.

DOCTOR OF PHARMACY (PHARM.D) BY COURSEWORK AND CLINICAL CLERKSHIP

- ▶ This 2-year full-time programme comprising both didactic and clerkship components, is designed to equip pharmacists with additional clinical knowledge as well as clinical skills and attitudes to deliver high quality and safe medication therapies to patients in collaboration with other health professionals.
- ▶ It builds on the foundations laid in the undergraduate programme, and focuses on pharmacotherapy topics in greater depth, and broadens students' clinical pharmacy knowledge and skills in the care of patients.
- ▶ This is relevant for the development of Specialist Clinical Pharmacists in Singapore.

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DEPARTMENT OF PHYSICS OUR PROGRAMMES AT A GLANCE

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN PHYSICS

- ▶ You will learn about the following topics: Electro-magnetism, Thermo- and Electrodynamics, Quantum Mechanics, Atomic and Nuclear Physics, Nanophysics, Relativity and relevant mathematical methods.
- ▶ Honours students can either study towards a general Honours degree or pursue one of these specialisations:
 - *Astrophysics*: You will learn about Celestial Physics and Cosmology, which will prepare you for future advanced studies and research. This specialisation is particularly suitable for students aspiring to be physics teachers in schools and Junior Colleges.
 - *Nanophysics*: You will learn about the scientific principles and methods of how physics is applied to industrial problem-solving and technological development.

DOUBLE DEGREE PROGRAMME IN B.ENG. IN MATERIALS SCIENCE AND ENGINEERING AND B.SC. / B.SC. (HONS) IN PHYSICS

- ▶ This programme is designed for Science and Engineering students who enjoy a science-driven and engineering-oriented education.
- ▶ You will be equipped with the physics knowledge that is needed to understand material properties and their applications as well as for the development of technological innovations.

For information on 2nd Major and Minor courses offered by the department, please browse the chapter on "Admission Information".

Graduate Programmes

M.SC. BY COURSEWORK

- ▶ This programme leads to an M.Sc. degree in either Physics or Applied Physics.
- ▶ The programme in Physics is designed to give an opportunity for physics teachers and other professionals to further upgrade their professional skills and qualifications.
- ▶ The programme in Applied Physics delivers advanced training in the field especially in areas such as Semi-conductor Manufacturing, Photonics and Biophysics. It is suited for physics graduates and other working professionals who wish to upgrade their professional skills and qualifications, or to switch to the hi-tech industry.

M.SC. / PH.D. BY RESEARCH

- ▶ Possible research areas include: Condensed Matter Physics, Surface Physics, Materials Science, High Energy Physics, Atomic Physics, Superconductor, Solid-State Ionics, Astrophysics, Infrared Spectroscopy, Laser Optics, X-Ray fluorescence, Ion-Beam Applications, Optics, Acoustics and Computer Simulations.

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DEPARTMENT OF STATISTICS & APPLIED PROBABILITY

OUR PROGRAMMES AT A GLANCE

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN STATISTICS

- ▶ You will learn about the scientific application of mathematical principles to the collection, analysis and presentation of data in order to reach sound conclusions or decide on a suitable course of action.
- ▶ Honours students can either study towards a general Honours degree or pursue one of these specialisations:
 - *Biostatistics**: You will learn about the application of statistics to quantitative research in the health sciences, which encompass subject matters such as Pharmacology, Medicine, Biotechnology, Biology, Genetics and Public Health.
 - *Finance and Business Statistics*: You will learn about the application of statistics to the areas of Investment & Financial Analysis, Insurance, Marketing Research and Management.

* The Biostatistics specialisation may be replaced by a Data Science specialisation as a result of an ongoing curriculum revision. More information will be available on the Faculty of Science website in due course.

DOUBLE MAJOR IN STATISTICS AND ECONOMICS

- ▶ Jointly offered with the Department of Economics in the Faculty of Arts and Social Sciences, this programme enables you to learn that statistical procedures play a key role in describing and forecasting economic behaviour and in testing economic theories of that

behaviour, while economics provides a variety of problems and cases to help in the understanding of statistics.

- ▶ With proper module planning and academic advice from the respective departments, you can fulfill both sets of Major and 2nd Major requirements without having to extend your candidature beyond the 4 years required for a single major Honours degree.

For information on 2nd Major and Minor courses offered by the department, please browse the chapter on "Admission Information".

Graduate Programmes

M.SC. BY COURSEWORK

- ▶ This is designed for students with a Bachelor's degree in Statistics, Mathematics or related fields. The programme focuses on developing practical skills in solving real-world problems found in various industries, including Finance, Service, Life and Health Sciences, Pharmaceuticals, Manufacturing, Education and Agriculture.
- ▶ You will acquire an excellent knowledge of statistical principles and methods that are needed in the application of statistics.

M.SC. BY RESEARCH

- ▶ You will acquire advanced knowledge of theoretical and applied statistics, which will enhance your mobility in statistics-related careers.
- ▶ Your research may be in the areas of High Dimensional Data Analysis, Computational Statistics, Probability Theory and Applications, Biostatistics and Financial Statistics.

PH.D. IN STATISTICS BY RESEARCH

- ▶ You will acquire skill sets relevant for producing high-quality research in statistics, which will put you in good stead in research & development and academia.
- ▶ Your research may be in the areas of High Dimensional Data Analysis, Bayesian Inference, Probability Theory and Applications, Biostatistics and Functional Data Analysis.

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COMPUTATIONAL BIOLOGY

OUR PROGRAMME AT A GLANCE

B.Sc. (Hons) in Computational Biology

- ▶ A 4-year multidisciplinary programme jointly offered by the Faculty of Science and School of Computing which provides interdisciplinary education in computer-based analysis of biological problems, the fastest growing area of the life sciences
- ▶ This programme is highly suited for students with keen interest in Mathematics, Computing, and Life Sciences.
- ▶ It also provides excellent research opportunities and mentorship. Students are often mentored by two professors in different faculties.
- ▶ In Years 1 and 2, you will learn the foundations of university level Life Sciences, Mathematics and Statistics, and Computer Science; how to develop, apply and interpret algorithms to biology; and how to reason analytically about biological problems.
- ▶ In Years 3 and 4, you will have the opportunity to focus on your interests, culminating with a 2-semester final year research project.

Key specialisation topics include:

- Theoretical Foundations and Analysis of Genes/Proteins
 - "Big data" analysis of next-generation DNA and RNA sequencing
 - Biological and Pharmaceutical Databases
 - Modelling of Biological Systems, including genes, pathways, and ecological systems
 - Computational Genomics
 - Computational Neuroscience
 - Computer-aided Drug Design
- ▶ You will graduate equipped with highly sought and broadly applicable skills in modern Biological Sciences, Mathematical and Statistical Analysis as well as Computer Science.

CONTACT US

**FACULTY OF SCIENCE DEAN'S OFFICE
(Undergraduate Programme)**

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BACHELOR OF ENVIRONMENTAL STUDIES OUR PROGRAMME AT A GLANCE

Overview

- ▶ This 4-year multidisciplinary programme offered from 2011, is jointly hosted by the Faculty of Science (FoS) and the Faculty of Arts and Social Sciences (FASS), with participation from the Faculty of Engineering, Faculty of Law, School of Design and Environment, NUS Business School, Yong Loo Lin School of Medicine, Saw Swee Hock School of Public Health, and Lee Kuan Yew School of Public Policy.
- ▶ It adopts a unique broad-based and interdisciplinary approach in addressing complex, modern environmental issues such as climate change, land use, water usage, alternative energy and the building of liveable high-density cities.
- ▶ In Years 1 and 2, you will acquire a solid foundation in environmental issues through a broad-based curriculum and read modules in Biology, Chemistry, Mathematics, Statistics, Economics, Geography, Building, Law, Public Health, Management and Policy.
- ▶ In Years 3 and 4, you will read modules in your chosen specialisation in either Environmental Biology hosted by FoS, or Environmental Geography hosted by FASS:
 - *Environmental Biology:* You will read modules in Behavioural Biology; Biodiversity; Evolution; Field Studies; Freshwater & Terrestrial Ecology; Marine Biology; and Physiology.

- *Environmental Geography:* You will read modules in Climate; Economics; Environmental Management; Geography; Geographical Information Systems; Geosciences; Modelling; and Sustainability.

Programme Highlights

- ▶ Experience integrated modules specially designed for you, which emphasise small-group discussions, case studies, fireside chats with key environmental luminaries, policy makers and government CEOs
- ▶ Participate in undergraduate research, as well as internship in environmental agencies, natural resource management agencies, and environmental research centres/institutes
- ▶ Participate in study abroad programmes such as semester-long Student Exchange Programme, Summer Programme, or Overseas Summer Research Programme
- ▶ Participate in real-world and real-time field studies of selected environmental challenges facing Asia

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ABOUT LEE KONG CHIAN NATURAL HISTORY MUSEUM

Overview

- ▶ The Lee Kong Chian Natural History Museum (LKCNHM) has its origins in the Raffles Museum of Biodiversity Research, which was founded in 1878 as a result of an idea mooted by Sir Stamford Raffles, making it the oldest such institution in the region.
- ▶ Today, LKCNHM is home to over a million plant and animal specimens from the region. It is a leader in Southeast Asian biodiversity and conservation research, education and outreach, and is also the national centre for the cryo-preservation of biodiversity tissue samples of more than 3,000 species.
- ▶ Launched in April 2015, LKCNHM is now an academic unit in the Faculty of Science and teaches a range of university modules for the Faculty of Science, University Scholars Programme and the College of Alice & Peter Tan, just to name a few. The museum's 2,200 m² exhibition gallery is dedicated to the biodiversity of Southeast Asia and Singapore, and displays over 2,000 species and fossils of three sauropod dinosaurs. It complements and is integrated in the museum's research and education programmes.

Education

- ▶ The university modules taught by LKCNHM leverage on the museum's extensive knowledge in biodiversity research, and are interactive with cutting-edge content delivered through engaging hands-on learning.
- ▶ LKCNHM offers educational workshops and programmes for teachers, students and the public on natural history, biodiversity and ecology.

Research

- ▶ LKCNHM staff and NUS students actively conduct research in conservation biology and ecology that covers terrestrial, freshwater and marine environments.
- ▶ The museum is visited by hundreds of scientists and students from all over the world, and its staff collaborate with researchers from over 20 countries around the world.
- ▶ Amongst LKCNHM's publications are the Raffles Bulletin of Zoology and Nature in Singapore. Raffles Bulletin of Zoology is a leading international, peer-reviewed Science journal that publishes papers on the taxonomy and conservation of animals in Southeast Asia and its adjacent areas. Nature in Singapore (NiS) is an online, peer-reviewed journal publishing papers on the natural history, biology and conservation of Singapore's biodiversity.

- ▶ In the coming year, the museum will start a major research programme with Sarawak on its terrestrial biodiversity.

Volunteer Programme

- ▶ The LKCNHM Toddycats! Programme started as a volunteer programme to expose, develop and enthuse NUS undergraduates to natural history, conservation, and biodiversity research.
- ▶ This programme is now also open to members of the public with enthusiasm and commitment towards Singapore's biodiversity.

CONTACT US

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SPECIAL PROGRAMMES

OUR PROGRAMMES AT A GLANCE

In addition to the diverse range of courses and the rigorous training provided by the basic degree programmes, the Faculty also offers a host of special programmes to broaden your intellectual and personal horizons.

Global Science Programme (GSP)

- ▶ Aims to train outstanding scientists to boost Singapore's Research & Development imperatives and meet the demands of the country's knowledge-based economy.
- ▶ Designed to attract the top 5% of each freshmen cohort enrolled in the Faculty of Science and nurture them through an innovative, concurrent, through-train Integrated Science Curriculum in the Special Programme in Science, followed by a joint M.Sc. / Ph.D. graduate programme with one of the top world-class universities.
- ▶ Typically comprises a 4-year B.Sc. (Hons) degree and a 1-year Masters degree by research at either NUS or an overseas partner university, followed by a 3-year joint Ph.D. in which half of the candidature will be spent at a selected prestigious partner university such as King's College London, Imperial College London, Australian National University, Ecole Polytechnique, German Institute of Science and Technology, Technical University of Munich, and many more.

▶ Some programmes designed under the Global Science Programme are:

4-year Concurrent Degree Programme in NUS B.Sc. (Hons) in Life Sciences and King's College London (KCL) M.Res. in Molecular Biophysics

- Aims to nurture talents for the increasingly important field of Biophysics.
- You will learn from experts, from the Randall Division of Cell & Molecular Biophysics in KCL, and the Mechanobiology Institute and Centre for Biolmaging Sciences in NUS.
- In the 1-year M.Res. programme, you will focus on in-depth practical biophysics research and read courses in molecular biophysics and biology.

5-year Concurrent Degree Programme in NUS B.Sc. (Hons) in Life Sciences or Chemistry and King's College London (KCL) M.Sc. in Forensic Science or Analytical Toxicology

- Aims to prepare students for careers in Forensic Science, analytical and supervisory roles within government and private institutions.
- In the KCL M.Sc. in Forensic Science programme, you will learn from forensic practitioners and field experts, as well as undergo experiential learning both on-site and in laboratories of the Forensic Science Service and Metropolitan Police Forensic Services.

- In the KCL M.Sc. in Analytical Toxicology programme, you will learn about the integration of theories and practices in Analytical Science with Clinical and Forensic Toxicology.

Joint Ph.D. Programme with King's College London (KCL)

- Aims to escalate research in the important fields of biological, biomedical and biophysical sciences to greater heights.
- Nurtures highly competent Ph.D. holders to tackle complex interdisciplinary scientific problems.
- You will graduate with a joint qualification, earning a certificate that bears the crest of both NUS and KCL.

For more information about GSP, please visit www.science.nus.edu.sg/undergraduate-studies/ugenh/gsp or email your enquiries to askscience@nus.edu.sg

NUS Pre-Medical Programme (PMP)

- ▶ Provides a select group of students a unique opportunity to better prepare themselves for entry to the Doctor of Medicine at Duke-NUS or graduate programmes in Biomedical Science upon successful completion of their undergraduate degrees and the requirements of the Pre-Medical Programme (PMP).

- ▶ 1st or 2nd year students from any discipline will be invited to apply each year and they will be assessed based on their academic potential, achievements and aptitude for a medicine course.
- ▶ Shortlisted students will take a semester-long Duke-NUS Pre-Med Course taught by Duke-NUS postdoctoral fellows. Throughout the course, students' performance will be assessed and a few will be selected as NUS "Pre-Med" Scholars.
- ▶ These scholars will be able to take part in medical shadowing and research internships as well as regular seminars and talks.
- ▶ Scholars will also have a chance to partake in a student exchange programme at Duke University, USA, one of the top private universities in the world.

For more information about PMP, please visit www.eng.nus.edu.sg/ugrad/SP_pre-med.html or email your enquiries to askscience@nus.edu.sg

Special Programme in Science (SPS)

- ▶ Prepares students with aptitude for Science, for modern multidisciplinary scientific challenges at the professional level.
- ▶ Fosters creative and critical thinking through scientific investigations and in-depth studies as well as mentorship by senior SPS students, graduate students, instructors and professors.
- ▶ Offers Integrated Science Curriculum, which comprises 4 specially-designed thematic modules that integrate Biology, Chemistry, Mathematics and Physics, and 2 research-oriented modules.
- ▶ Admission is selective; prospective students are interviewed to determine the passion they demonstrate in science and their intellectual maturity.

For more information about SPS, please visit <http://sps.nus.edu.sg/alpha/> or email your enquiries to admin@sps.nus.edu.sg

Undergraduate Professional Internship Programme (UPIP)

- ▶ Students participating in the internship programme will undergo experiential learning to improve their repertoire of interpersonal communication skills, overall effectiveness and improve their self-confidence.

Through the programme, you will get to:

- **Plan your academic and career development strategies:**
You will be able to test your interests and develop long-term career plans, which will also help you to select elective course work that integrates your studies and career goals
- **Acquire transferable skills:**
The work experience will develop your maturity by strengthening your resourcefulness, problem-solving skills, self-discipline, response-abilities and teamwork.

- **Translate scientific principles:**
You will be adept in applying what you have learnt in our science curriculum to perform technical assignments in a real-world professional environment.
- ▶ Upon successful completion of the internship, students will also be awarded with Unrestricted Modular Credit (MC) that would count towards their graduation requirement.

For more information about UPIP, please visit www.science.nus.edu.sg/students/upip or email your enquiries to sciupip@nus.edu.sg

Undergraduate Research Opportunities Programme in Science (UROPS)

- ▶ Provides you a unique opportunity to work with our Faculty members and experience the challenges and benefits that come from pursuing an independent research project.
- ▶ Allows you to engage actively in research, discussions, intellectual communications and other creative activities.
- ▶ Enhances your knowledge in the latest development of science and technology and equip you with special communication and presentation skills.
- ▶ Places you at frontiers of scientific research and allow you to interact and forge closer ties with established scientists and members of their groups.

- ▶ You can choose to undertake a UROPS project during regular semesters or special terms (May – July).

For more information about UROPS, please visit www.science.nus.edu.sg/undergraduate-studies/ugenh/urops-main or email your enquiries to askscience@nus.edu.sg

University Scholars Programme (USP)

- ▶ A multidisciplinary academic programme, which admits students from 7 faculties/schools - Arts and Social Sciences, Business, Computing, Design and Environment, Engineering, Science and Law.
- ▶ Offers students a globally distinctive university experience that provides core intellectual skills which cut across disciplines, and encourages growth and fosters leadership attributes in a residential college setting.
- ▶ USP students attend seminar-style classes, and do 30% of their academic work in USP and 70% in their home faculty/school where they read their majors. They also stay at the USP residential college - Cinnamon College (USP) - at the University Town for at least 2 years, where learning and living spaces are all integrated in one location.
- ▶ USP students organise or take part in USP International Programmes, which challenges them on issues outside their usual fields of interests and enhance

their global perspective as well as deepen their understanding of themselves.

- ▶ USP admissions open every year with NUS general admissions and selected applicants will be interviewed. A 2nd USP admissions exercise is also considered for freshmen of Faculty of Science in the 2nd semester of their study.
- ▶ USP is not a scholarship disbursement programme. USP students may however apply for NUS scholarships, or can be recipients of other scholarships.
- ▶ Upon successful completion of USP requirements and an honours programme, USP students graduate with an honours degree from their faculty/school, receiving a certificate that recognises them as University Scholars.

For more information about USP, please visit www.usp.nus.edu.sg/aboutusp/index.html or email your enquiries to askscience@nus.edu.sg

STUDY ABROAD PROGRAMMES

OUR PROGRAMMES AT A GLANCE

Our Study Abroad Programmes offer students a global learning experience, grooming them to be resilient and culturally sensitive. There are more than 300 partner universities for you to choose from, to enhance your intellectual and personal development with a global perspective. Ranging from 4 weeks to a full year, these programmes allow you to study abroad while paying only home university fees. All courses taken while on exchange will be able to earn you modular credits towards fulfilling of graduation requirements.

Student Exchange Programme

- ▶ Students spend 1 semester or a year at an overseas partner university.
- ▶ We have over 300 reputable partner universities, including University of British Columbia, University of California, University of Bath, University of Toronto, University of Hong Kong, King's College London, Karolinska Institute, Utrecht University, University of North Carolina at Chapel Hill, La Trobe University, University of Copenhagen and many more.
- ▶ Going on exchange offers opportunities for students to read modules not taught in NUS.

Summer Programme

- ▶ Spanning 4 to 7 weeks, these programmes are ideal for students who prefer to explore overseas learning experience outside the regular semesters.
- ▶ Some participating overseas universities include the University of Toronto (Canada), University of California, Los Angeles (USA), Tel Aviv University (Israel), University of Costa Rica (Costa Rica) and Tec De Monterrey (Mexico).
- ▶ Places offered in our partner universities are reserved for Science students only.
- ▶ Summer Programmes may offer opportunities for students to read NUS modules in an overseas setting.

Overseas Summer Research Programme

- ▶ Students spend 6 to 12 weeks in the laboratories of our partner universities conducting research under the supervision of prominent overseas faculty members.
- ▶ Some partner universities include California Institute of Technology (Caltech), Cambridge University, Imperial College London (ICL), King's College London (KCL), Massachusetts Institute of Technology (MIT), University Autonoma de Madrid (UAM), University of North Carolina Chapel Hill (UNC-CH) and University of Queensland (UQ).
- ▶ Students from all disciplines can enrol in these programmes.

NUS Overseas Colleges

- ▶ Selected students will spend 12 months with a high tech start-up in Silicon Valley, Beijing, Shanghai, Stockholm or New York, or spend 3 to 6 months in Israel or the programme iLead.
- ▶ You will receive first-hand insight into the mechanisms of a high tech start-up and experience the challenges faced by the founders of these companies.
- ▶ You can enrol in entrepreneurship courses at highly reputable universities like Stanford University, Fudan University, Tsinghua University and the KTH Royal Institute of Technology.

Double Degree Programme with the French Grandes École

- ▶ The Grandes Écoles are a cluster of world renowned institutions of higher scientific learning with a history of over 200 years, known for educating France's technical and managerial elites.
- ▶ NUS has set up Double Degree programmes with 6 premier French Grandes École:
 - École Polytechnique (X)
 - École Centrale Supélec (Supélec)
 - École des Mines de Paris (Mines Paris Tech)
 - École Nationale Supérieure des Télécommunications (Télécom ParisTech)

- École Nationale Supérieure de Techniques Avancées (ENSTA ParisTech)
- École des Ponts ParisTech (École Nationale des Ponts et Chaussées)
- ▶ Students are selected in their 1st year from among top Engineering, Science and Computing applicants' cohorts.
- ▶ Grandes Écoles places strong emphasis on Mathematics and Physics curricula in the 1st year, hence students in Mathematics and Physics will be invited to apply
- ▶ Successful students will undergo French language preparation, spend their 3rd and 4th year in a French institution, and return to NUS for their M.Sc. Programme
- ▶ Upon graduation, students will receive a B.Sc. (Hons) degree, an M.Sc. degree from NUS, and a Diplôme d'Ingenieur (the equivalent of Masters in France) from a French Grande École.

Joint Degree Programme with Australian National University (ANU)

- ▶ This 4-year programme combines the Bachelor of Philosophy (Hons) degree of the Australian National University (ANU) with the Bachelor of Science (Hons) degree of NUS.
- ▶ Designed for students who have a strong interest and aptitude for graduate research work, it is only offered to Science students in the University Scholars Programme who are majoring in Chemistry, Mathematics and Physics.
- ▶ Students spend 3 semesters at NUS, followed by 3 semesters at ANU, before returning to NUS to complete the Honours year.
- ▶ You can acquire a strong foundation in critical analysis and depth in the principles of each subject and engage actively in independent undergraduate research work.
- ▶ 8 to 10 students are accepted into the programme annually.
- ▶ Applications will open in September/October of each year. Successful students are provisionally admitted to the programme based on their academic performance and other relevant qualifications. Official admittance into the programme will only take place at the end of their 3rd semester of study.

Joint Degree Programme in Life Sciences with University of North Carolina at Chapel Hill (UNC-CH)

- ▶ A collaboration between our Faculty of Science and the College of Arts and Sciences, University of North Carolina at Chapel Hill (UNC-CH), this 4-year programme leads to a B.Sc. (Hons) in Life Sciences from NUS and a B.Sc. in Biology from UNC-CH.
- ▶ It combines the strengths of both universities' undergraduate curricula in Life Sciences and integrates the opportunity for students to study overseas.

- ▶ It offers students from both institutions a unique learning experience encompassing advanced Life Sciences modules, undergraduate research and an exceptional liberal arts education.
- ▶ NUS students will generally spend Semesters 1 to 3 in NUS, Semesters 4 to 6 in UNC-CH and Semesters 7 to 8 in NUS.
- ▶ Upon graduation, students will receive a degree jointly validated by NUS and UNC-CH.

Joint Minor Programme

- ▶ This programme offers students 2 joint minor programmes in either Environmental Biology or Environmental Chemistry with the University of Toronto (UofT).
- ▶ Students study advanced courses for at least 1 semester at UofT to leverage on their competencies in the areas of Environmental Sciences.

For more information about the above study abroad programmes, please visit www.science.nus.edu.sg/education/undergraduate/ug-programmes/sap-outgoing
You can also email your enquiries to askscience@nus.edu.sg

ADMISSION INFORMATION AT A GLANCE

Admission Requirements For Students with GCE 'A' Level (H1/H2) Qualifications or Equivalent

- For admission to the Faculty of Science, applicants must have good GCE 'A' Level (H2) passes or equivalent in at least 2 of these Science subjects: Biology, Chemistry, Computing, Mathematics, Physics.
- Students admitted to the Faculty of Science will choose their major in July if they meet the pre-requisites for that major.

Primary Majors leading to an Honours Degree	Prerequisites for students offering H2 curriculum or equivalent
<ul style="list-style-type: none"> Chemistry Chemistry Specialisation in Materials Chemistry Specialisation in Medicinal Chemistry Specialisation in Environment and Energy	Good H2 pass or equivalent in Chemistry and at least a good 'O' Level pass or equivalent in Mathematics
<ul style="list-style-type: none"> Computational Biology*# 	Applicants should have good H2 passes or equivalent in Mathematics and either Biology or Chemistry. Students without H2 pass or equivalent in either Biology or Chemistry should have at least an O-level or equivalent pass in it.
<ul style="list-style-type: none"> Food Science and Technology* 	Good H2 pass or equivalent in Chemistry and one other Science/ Mathematics subject, and at least a pass in O-Level or equivalent in Biology. Students without H2 pass in Biology are required to read the bridging module in Biology (i.e. LSM1301) in Semester 1 to fulfil the pre-requisite for the relevant Level 1000 Life Sciences module in the syllabus.
<ul style="list-style-type: none"> Life Sciences Life Sciences Specialisation in Biomedical Science Specialisation in Environmental Biology Specialisation in Molecular and Cell Biology	Good H2 passes or equivalent in Biology, Chemistry, and either Mathematics or Physics Students without H2 pass in Biology or Chemistry may read the relevant bridging modules as entry requirements

Primary Majors leading to an Honours Degree	Prerequisites for students offering H2 curriculum or equivalent
<ul style="list-style-type: none"> • Mathematics • Applied Mathematics • Applied Mathematics Specialisation in Mathematical Modelling and Data Analytics Specialisation in Operations Research and Financial Mathematics <ul style="list-style-type: none"> • Quantitative Finance* 	Good H2 pass or equivalent in Mathematics
<ul style="list-style-type: none"> • Pharmacy# (Professional programme where application is by direct admission only)	Very good H2 passes or equivalent in Chemistry and either Biology, Mathematics or Physics
<ul style="list-style-type: none"> • Physics • Physics Specialisation in Astrophysics Specialisation in Nanophysics	Good H2 passes or equivalent in Mathematics and Physics
<ul style="list-style-type: none"> • Statistics • Statistics Specialisation in Biostatistics+ Specialisation in Finance and Business Statistics	Good H2 pass or equivalent in Mathematics

Interdisciplinary Degree Programme	Prerequisites for students offering H2 curriculum or equivalent
<ul style="list-style-type: none"> • Bachelor of Environmental Studies Programme (Specialisation in Environmental Biology)#	Good H1 pass or equivalent in Mathematics and good H2 pass or equivalent in either Biology or Chemistry

NOTE:

- a) * Admission to the Faculty of Science does not automatically qualify a student to choose these majors as there will be additional departmental selection due to limited places.
- b) #These are strict 4-year programmes while students in other majors can graduate with a Bachelor of Science (B.Sc.) degree after 3 years.
- c) + The Biostatistics specialisation may be replaced by a Data Science specialisation as a result of an ongoing curriculum revision. More information will be available on the Faculty of Science website in due course.
- d) Specialisations are awarded only with B.Sc. (Hons) degree.

Courses Beyond Primary Major

The Faculty of Science offers a flexible curriculum, which allows students who wish to enrich and broaden their educational experiences, to choose other courses and programmes beyond their primary major course. Students may do a double degree (two degrees with 2 full majors), choose double major (1 primary and 1 second major) and/or minor programmes within and outside the Faculty.

WITHIN FACULTY OF SCIENCE

Second Majors (Optional)	Prerequisites for students offering H2 curriculum or equivalent
• Chemistry	Good H2 pass or equivalent in Chemistry
• Life Sciences	Good H2 passes or equivalent in Biology, Chemistry, and either Mathematics or Physics
• Mathematics • Statistics	Good H2 pass or equivalent in Mathematics
• Physics	Good H2 pass or equivalent in Physics

Minors (Optional)	Prerequisites for students offering H2 curriculum or equivalent
• Analytical Chemistry	Good H2 pass or equivalent in Chemistry
• Biophysics	Good H2 passes or equivalent in Physics, Chemistry and/or Biology
• Forensic Science*	Good H2 passes or equivalent in Chemistry and Biology
• Life Sciences*	Good H2 pass or equivalent in Biology
• Mathematics • Financial Mathematics • Statistics	Good H2 pass or equivalent in Mathematics
• Nanoscience	Good H2 pass or equivalent in either Chemistry or Physics

Minors (Optional)	Prerequisites for students offering H2 curriculum or equivalent
<ul style="list-style-type: none"> • Pharmaceutical Sciences* 	Good H2 pass or equivalent in either Chemistry or Biology
<ul style="list-style-type: none"> • Physics • Optical and Semiconductor Technology 	Good H2 pass or equivalent in Physics

Joint Minors (Optional)	Prerequisites for students offering H2 curriculum or equivalent
<ul style="list-style-type: none"> • Aquatic Ecology* 	Open to students from all disciplines with an interview required
<ul style="list-style-type: none"> • Engineering Materials* 	Good H2 pass or equivalent in either Chemistry or Physics
<ul style="list-style-type: none"> • Environmental Biology* 	Good H2 passes or equivalent in Biology and Mathematics
<ul style="list-style-type: none"> • Environmental Chemistry* 	Good H2 passes or equivalent in Physics and Mathematics
<ul style="list-style-type: none"> • Medical Physics* 	Open to students from Faculty of Science and Faculty of Engineering with good H2 passes or equivalent in Physics and Biology

* Application is subject to departmental approval

OUTSIDE FACULTY OF SCIENCE

With effect from AY2015/2016, students can apply direct to the following double major programmes via the online admission application form:

FoS Major	FASS 2 nd Major	Admission requirements*
Applied Mathematics (Hons)	Economics	Good H2 Pass or equivalent in Mathematics
Mathematics (Hons)	Economics	Good H2 Pass or equivalent in Mathematics
Statistics (Hons)	Economics	Good H2 Pass or equivalent in Mathematics
Life Science (Hons)	Psychology	Good H2 Passes or equivalent in Biology, Chemistry and either Mathematics or Physics

*Applicants satisfying the admission requirements will be subjected to selection criteria before being admitted into the programme.

After admission to the Faculty of Science, students can also self-design their own major/2nd major or double degree combinations as shown below.

EXAMPLES OF POSSIBLE DOUBLE MAJOR COMBINATIONS

- Applied Mathematics and Management
- Chemistry and Management
- Chemistry and Political Science
- Life Sciences and English Language
- Life Sciences and Management
- Mathematics and Chinese Studies
- Quantitative Finance and Economics

EXAMPLES OF POSSIBLE DOUBLE DEGREE COMBINATIONS

- Chemistry and Business Administration
- Life Sciences and Business Administration
- Life Sciences and Computer Science
- Life Sciences and Economics
- Mathematics / Applied Mathematics and Business Administration
- Mathematics / Applied Mathematics and Computer Science
- Mathematics / Applied Mathematics and Economics
- Physics and Materials Science & Engineering
- Physics and Mechanical Engineering
- Quantitative Finance and Business Administration
- Quantitative Finance and Economics
- Statistics and Business Administration

For more information on such self-design programmes, please visit: <http://www.science.nus.edu.sg/undergraduate-studies/ugprog/fass-second-majors>

You can also email your enquiries to askscience@nus.edu.sg

Admission Requirements For Polytechnic Diploma Holders

Local polytechnic applicants (regardless of nationality) will be considered for admission if their Diplomas are accredited to our Science, Pharmacy or Environmental Studies courses.

Nanyang Polytechnic	NUS Major Courses
Biologics & Process Technology	Science (Chemistry)
Biomedical Engineering	Science (Physics)
Chemical & Green Technology	Environmental Studies Science (Chemistry)
Chemical & Pharmaceutical Technology	Science (Chemistry)
Digital & Precision Engineering	Science (Physics)
Electronics, Computer & Communication Engineering/ Electronics, Computer & Control Engineering	Science (Physics)
Food Science & Nutrition (Previously named as Food Science)	Science (Food Science and Technology) Science (Chemistry)
Manufacturing Engineering	Science (Physics)
Mechatronics Engineering	Science (Physics)
Medicinal Chemistry	Science (Chemistry) Science (Pharmacy)
Molecular Biotechnology	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Molecular Biotechnology (Pharmaceutical & Clinical Trial track)	Science (Life Sciences) Science (Pharmacy)
Molecular Biotechnology (R&D/Bioenterprise/Manufacturing track)	Science (Life Sciences) Science (Pharmacy)

Nanyang Polytechnic	NUS Major Courses
Nanotechnology & Materials Science	Science (Chemistry) Science (Physics)
Pharmaceutical Sciences	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)

Ngee Ann Polytechnic	NUS Major Courses
Aerospace Technology/ Aerospace Technology (with minor in Business Management)	Science (Physics)
Biomedical Engineering / Biomedical Engineering (with minor in Business Management)	Science (Computational Biology) Science (Life Sciences) Science (Physics)
Biomedical Laboratory Technology / Biotechnology	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Biomedical Science (for 2015 poly graduates onwards) • Specialisation: Clinical Laboratory Technology • Specialisation: Biomedical Research • Specialisation: Medicinal Chemistry (newly renamed)	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Biomedical Science (for 2014 poly graduates or earlier) / Biomedical Science (Medical Laboratory Technology option)	Science (Chemistry) Science (Life Sciences) Science (Pharmacy) Environmental Studies
Chemical Engineering	Science (Chemistry)
Chemical & Biomolecular Engineering	Science (Chemistry)

Ngee Ann Polytechnic	NUS Major Courses
Electrical Engineering/ Electrical Engineering (with minor in Business Management)	Science (Physics)
Engineering Science	Science (Physics)
Environmental & Water Technology	Environmental Studies
Landscape design and Horticulture (previously named as Horticulture & Landscape Management)	Science (Life Sciences)
Molecular Biotechnology	Science (Chemistry) Science (Life Sciences) Science (Pharmacy) Environmental Studies
Optometry	Science (Life Sciences)
Pharmacy Science	Science (Chemistry) [For 2013 graduates & earlier] Science (Life Sciences) Science (Pharmacy)
Veterinary Bioscience	Science (Life Sciences) Environmental Studies

Republic Polytechnic	NUS Major Courses
Aerospace Engineering	Science (Physics)
Biomedical Electronics	Science (Computational Biology)

Republic Polytechnic	NUS Major Courses
Biomedical Science	Science (Chemistry) [For 2013 graduates & earlier] Science (Life Sciences) Science (Pharmacy) Environmental Studies
Biotechnology	Science (Chemistry) [For 2013 graduates & earlier] Science (Life Sciences) Science (Pharmacy) Environmental Studies
Environmental Sciences	Science (Chemistry) Science (Life Sciences) Environmental Studies
Materials Science	Science (Chemistry) Science (Physics)
Pharmaceutical Sciences	Science (Chemistry) [For 2013 graduates & earlier] Science (Life Sciences) Science (Pharmacy) Environmental Studies

Singapore Polytechnic	NUS Major Courses
Aeronautical Engineering	Science (Physics)
Applied Chemistry with Pharmaceutical Science (previously named as Chemical Process Technology [Industrial Chemistry])	Science (Chemistry) Science (Pharmacy) Environmental Studies
Biomedical Science	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Biotechnology (Medical Technology option)	Science (Life Sciences) Science (Pharmacy)

Singapore Polytechnic	
Biotechnology	Science (Chemistry) Science (Life Sciences) Science (Pharmacy) Environmental Studies
Chemical Engineering / Process Engineering	Science (Chemistry)
Environmental Management & Water Technology	Environmental Studies
Food Science & Technology (previously named as Chemical Process Technology [Food Technology])	Science (Food Science and Technology) Science (Chemistry) Science (Pharmacy)
Materials Engineering	Science (Chemistry)
Materials Science (previously named as Chemical Process Technology [Polymer Option])	Science (Chemistry)
Medical Technology	Science (Life Sciences) Science (Pharmacy)
Nutrition, Health & Wellness	Science (Food Science and Technology) Science (Life Sciences)
Perfumery and Cosmetic Science (previously named as Chemical Process Technology [Industrial Chemistry])	Science (Chemistry) Science (Pharmacy)

Temasek Polytechnic	NUS Major Courses
Applied Food Science & Nutrition	Science (Food Science and Technology) Science (Pharmacy)
Biomedical Engineering (for 2015 poly graduates onwards) [previously named as Biomedical Informatics & Engineering]	Science (Computational Biology) Science (Life Sciences) Science (Physics)

Temasek Polytechnic	NUS Major Courses
Biomedical Science	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Biotechnology	Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Chemical Engineering	Science (Chemistry)
Pharmaceutical Science	Science (Food Science and Technology) Science (Chemistry) Science (Life Sciences) Science (Pharmacy)
Veterinary Technology	Science (Life Sciences)

Advanced Placement Credits

Advanced placement credits (APCs) are given to diploma holders of approved programmes from the 5 polytechnics in Singapore. Such students admitted to a 4-year degree programme may be granted APCs in relevant modules for up to a maximum of 40 modular credits (MCs), as follows:

AUTO-GRANTED MCS

- (i) 20 MCs from Unrestricted Elective Modules

PERFORMANCE-BASED MCS

- (ii) Up to 20 MCs from Programme Requirements may be granted based on performance in advanced placement tests and/or interviews set by the department offering the module

Computation of Admission Score for AY2016/2017

- (1) Polytechnic Results 80%
- (2) Singapore-Cambridge GCE 'O' Level Results 20%

Please visit the Office of Admissions website for more details: www.nus.edu.sg/oam/apply/apply.html

