DISCOVER SCIENCE @NTU

Asian School of the Environment
School of Biological Sciences
School of Physical and Mathematical Sciences

www.cos.ntu.edu.sg

Biological Sciences
Biomedical Sciences and Chinese Medicine
Chemistry and Biological Chemistry
Environmental Earth Systems Science
Mathematical Sciences
Physics and Applied Physics
DEAN’S MESSAGE

“CoS at NTU is unique in that it is a truly interdisciplinary college.”

Professor Chee Yeow Meng
Dean, College of Science
It is my pleasure to welcome you to the College of Science (CoS) at the Nanyang Technological University (NTU)! We are home to the Asian School of the Environment, School of Biological Sciences, and School of Physical and Mathematical Sciences. A young institution of barely 17 years old, CoS provides a world class research and education environment spanning classical and contemporary areas of the modern sciences.

CoS at NTU is unique in that it is a truly interdisciplinary college. Most members of our remarkable faculty cross two or more domains. For example, we have biologists exploring in food science, chemists creating new materials, mathematicians making impact in computer science, and physicists working in financial engineering.

CoS faculty is devoted to advancing scientific knowledge through research and education. We are beginning to build a reputation on our research achievements and are leveraging on that base to continue to address scientific problems of major societal concerns, such as those exemplified by the Peaks of Excellence of Sustainable Earth, Global Asia, Secure Community, Health Society, and Future Learning in the NTU 2020 five-year strategic plan.

CoS degree programs are also known for the quality of its graduates. Our students have gained admission to top graduate schools around the world, including Harvard, UC Berkeley, and University College London. Many are also recruited by marquee employers such as Bloomberg, BP, Citibank, GlaxoSmithKline, Google, and Singapore Airlines.

I invite you to visit this wonderful ecosystem of research and education in CoS.
ASSOCIATE DEAN’S MESSAGE

Welcome, all students, to the College of Science at NTU! If you have a passion for the natural world and for analytical thinking, pursuing a degree programme at the College of Science will inspire your quest for inquiry and creativity. Our Science education programmes will develop critical thinking and problem solving ability that will equip you for careers in a wide range of areas of society, locally or overseas. There is no better foundation for further studies in science or other disciplines than a degree in science.

As a student in the College of Science, at the Asian School of the Environment, the School of Biological Sciences, or the School of Physical and Mathematical Sciences, you will be part of a close-knit community of dedicated individuals who all share a common passion for science and education. Professors, research staff and graduate students provide students with ample research attachment opportunities and internship programmes outside the normal curriculum. Our large network of contacts with partners in industry, at research institutes and government agencies is available for students to tap into for external attachment opportunities.

Student life at the College of Science will enrich your personal character and develop friendship for life. As an NTU student, you are encouraged to develop your communication and leadership skills through participation in Club and Hall activities as well as a range of activities in sports at the beautiful NTU Garden Campus. We encourage all students to participate in overseas exchange programmes with several of the best universities in the world. As a student in the College of Science, you will have the opportunity to be a globally engaged student experiencing overseas academic cultures.

Professor Lars Nordenskiöld
Associate Dean (Academic), College of Science

“Student life at the College of Science will enrich your personal character and develop friendship for life.”
WHAT’S SO SPECIAL ABOUT STUDYING SCIENCE@NTU?

OUTSTANDING FACULTY MEMBERS
Students are taught by a team of top-notch, internationally qualified faculty from over 29 nations; bringing unique perspectives, teaching methods and extensive contact networks from all corners of the globe. The College of Science has renowned Nanyang Professors and National Research Foundation Fellows among its ranks.

WORLD CLASS CURRICULUM
The curricula and standards for the various disciplines in the College of Science are modelled after those of the best universities in the world such as Caltech, Yale, UCLA, Cornell.

DIRECT HONOURS PROGRAMMES
The College of Science offers direct Honours programmes in Biological Sciences, Biomedical Sciences, Chemistry and Biological Chemistry, Environmental Earth Systems Science, Mathematical Sciences, Mathematics and Economics, and Physics and Applied Physics. This system gives all students, regardless of academic standing, exposure to advanced coursework and project work.

CN YANG SCHOLARS PROGRAMME
Outstanding undergraduate students may be selected to join the prestigious CN Yang Scholars Programme. This programme empowers students not only with a core degree in science or mathematics, additionally there are many enrichment opportunities woven into the programme.

SCHOLARSHIP AWARDS
NTU offers a variety of scholarships to top students in recognition of their academic excellence and leadership qualities.

STUDY AND WORK OVERSEAS
Students have the opportunity to gain cross cultural experience in reputable overseas universities. The NTU’s overseas programmes allow students to study and work abroad.

EXCELLENT CAREER PROSPECTS
Science and Mathematics graduates have a wide range of careers to choose from in a variety of industrial sectors such as the Life Sciences, Healthcare, Finance and Engineering sectors. Career prospects include, but are certainly not limited to: research, research support, business, management, administration, banking, IT and education.
The Asian School of the Environment (ASE) at NTU is an interdisciplinary School that aims to be a world leader in environmental research focused on Asian environmental challenges. The ASE integrates Earth and environmental life science, ecology, engineering and technology, human ecology, humanities, and the social sciences to address key issues of the environment and sustainability.

BACHELOR OF SCIENCE (HONOURS) IN ENVIRONMENTAL EARTH SYSTEMS SCIENCE

The Environmental Earth Systems Science major is the flagship programme of the ASE. Students who choose this course will gain a strong background in quantitative skills, modern computing techniques, and core environmental earth systems, maths and sciences. In addition, our programme emphasises leadership, group work, and innovative problem-solving skills, which are required to be successful in today’s workforce regardless of field.

CAREER PROSPECTS

Our graduates are prepared with diverse skill-sets and knowledge to fill a wide array of both public and private sector positions or to pursue graduate programmes. Our graduates have job opportunities in Singapore, Southeast Asia and overseas, and are prepared to tackle the environmental challenges of the 21st Century.
Possible career options:
- Natural resource exploration, extraction and management (oil, gas and minerals)
- Water resource management/hydrologist
- Environmental consulting
- Geotechnical consulting
- Geologic survey or monitoring
- Environmental planning, policy, and management
- Urban planning
- Teaching or Research

Graduates will also have the opportunity to choose careers with employers not commonly associated with earth and environmental sciences, such as:
- Insurance companies, who rely on earth scientists to help assess long-term risk due to earthquake, volcanoes, climate change, and other natural disasters
- The financial sector, where firms seek quantitative knowledge about the science driving changes in the energy market
- Business, for companies that value technical know-how and creativity

DOUBLE MAJOR: *NEW*
BACHELOR OF SCIENCE (HONOURS) IN ENVIRONMENTAL EARTH SYSTEMS SCIENCE AND PUBLIC POLICY AND GLOBAL AFFAIRS

This double major programme is the newest degree to be offered by the Asian School of the Environment. Students admitted to this multidisciplinary course will develop a strong background in quantitative environmental earth systems science and communication, public affairs, and international relations. The joint programme will give students the opportunity to build complementary skills in leadership, group work, and innovative problem-solving, empowering the next generation of public policy makers with the tools required to face the challenges of today’s rapidly changing world.

CAREER PROSPECTS

Possible career options:
- Government roles - planning, policy, and management
- Foreign and domestic policy
- Science communications
- Environmental consulting
- Environmental media and journalism
- Academic research
- Education
- Conservation
- Non-government organisations

Graduates from this Double Major program will also have the unique opportunity to choose careers with employers bridging science, business and policy:
- Reinsurance companies, who rely on a balance of earth science data and policy intuition to help assess long-term risk.
- International governance, such as the World Bank, UNESCO and World Food Agency who seek graduates with quantitative knowledge about the science underlying fundamental changes in policy around the world.
- Businesses or corporations that value technical knowledge, creative problem solving and leadership ability when dealing with changing environmental policy and the global move towards improved global sustainability practices.
Since its inception in 2002, the School of Biological Sciences (SBS) key focus is to prepare students with the skills and knowledge required to excel in today’s global environment. The expectations of today’s graduates are very different, it is for this reason that SBS has developed a Biological Sciences degree with a range of second major programmes that allow students to diversify their skills with specialised knowledge in their area of interest. In addition, the School of Biological Sciences is unique in Singapore, in offering a double degree programme, which combines the SBS Bachelor of Biomedical Science with a Bachelor of Chinese Medicine. The rich mix of culture and nationalities among our professors and students, our varied opportunities for overseas study, and our partnerships with renowned institutes worldwide, provide for a global perspective on science and industry for our students.

BACHELOR OF SCIENCE (HONOURS) IN BIOLOGICAL SCIENCES

The study of biology is highly relevant to everyday life. At some point, we discovered that we are fascinated by living systems. As the knowledge base in the biological sciences grows exponentially and technology become ever more sophisticated, the ability to think broadly about biology and to apply your knowledge across boundaries of disciplines will inevitably become a very valuable and powerful asset both in the scientific environment and many walks of life. This programme will prepare you for a variety of careers where you can make a difference in the world. Our mission is to enable you to reach your potential while celebrating the study of life. The curriculum covers specialized and advanced topics in stem cells, Cancer Biology and therapy, physiology, evolutionary biology, neurosciences, among others. In the final year, students can choose to do a final year research project or internship with industry partners.
BACHELOR OF SCIENCE (HONOURS) IN BIOLOGICAL SCIENCES WITH SECOND MAJOR IN BIOMEDICAL MATERIALS

Biomaterials science is a rapidly growing field. Biomedical materials have an enormous impact on healthcare throughout the world, and they will continue to be important in advancing patient care and in the medical industry. With the emergence of tissue engineering and regenerative medicine, it also means increasing opportunities for young scientists to work on new clinical treatments for injury and diseases. Students of this interdisciplinary programme will undergo training in biological sciences and biomedical materials areas such as immunology, physiology, advanced biomaterials and nanomaterials.

BACHELOR OF SCIENCE (HONOURS) IN BIOLOGICAL SCIENCES WITH SECOND MAJOR IN BIOMEDICAL STRUCTURAL BIOLOGY

Structural biology has gained importance in the biomedical field, with an increasing impact on healthcare and medicine. Areas of study include structure-based discovery, structure-based vaccine design, structure-based design of biologics, structure-based design of novel biomaterials and structure-based design of protein engineering.

BACHELOR OF SCIENCE (HONOURS) IN BIOLOGICAL SCIENCES WITH SECOND MAJOR IN FOOD SCIENCE AND TECHNOLOGY (NANYANG SCHOLARSHIP PROGRAMME)

This is a popular programme introduced in 2013. It is conducted in partnership with the Wageningen University (The Netherlands), NTU School of Chemical and Biomedical Engineering and School of Physical and Mathematical Sciences, the interdisciplinary nature of this new unique programme will benefit students who are interested in biology and further wish to gain understanding about food processes with an engineering and industrial point of view.
BACHELOR OF SCIENCE (HONOURS) IN BIOLOGICAL SCIENCES WITH SECOND MAJOR IN MEDICINAL CHEMISTRY AND PHARMACOLOGY  *UPDATED*

Combining with the biological sciences programme and in partnership with the Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, enrolled students will be cross-trained in biological sciences and chemistry building a relevant foundation to embark on research and development in the area of chemical biology.

DOUBLE MAJOR:  
BACHELOR OF SCIENCE (HONOURS) IN BIOLOGICAL SCIENCES AND PSYCHOLOGY  *NEW*

In collaboration with the School of Social Sciences, this highly inter-disciplinary degree offers students the opportunity to specialize in two major academic disciplines from the two Schools. The programme equips students with the transferrable skills of a combined education for successful careers in the rapidly changing environment of the 21st century. In Singapore with its population encountering increasing higher levels of stress, there is a growing emphasis on awareness of mental health and a demand for professionals with interdisciplinary training in Psychology. This programme offers more consistent depth in both disciplines. Students who have a curiosity in areas such as human emotions, behaviors and thoughts can now adopt a more integrated approach towards its understanding.
DOUBLE DEGREE:
BACHELOR OF SCIENCE (HONOURS) IN BIOMEDICAL SCIENCES
BACHELOR OF CHINESE MEDICINE
(中医学学士学位)

This unique five-year double degree programme is an amalgamation of the western approach to Biomedical Sciences with Traditional Chinese Medicine. The Bachelor of Science (Honours) in Biomedical Sciences is conferred by NTU and the Bachelor of Medicine (Chinese Medicine) is conferred by the Beijing University of Chinese Medicine (BUCM). The first three years of the double degree are taught at NTU, while the final two years are taught at the BUCM in the People’s Republic of China. This is a bilingual course with English and Mandarin as the languages of instruction.
CAREER PROSPECTS

As a graduate of our programmes, you will have numerous career options ahead of you. In the public sector, life sciences graduates are well sought after in hospitals, research institutes, government agencies and forensic departments. Commercial sectors that actively seek out graduates from the life sciences include the pharmaceutical, biotechnology, food, water and agriculture industries for roles such as process engineers, biotechnologist, QA specialist and clinical researcher.

There is also demand for life sciences graduates to contribute to the public understanding of science as journalist, scientific writers and information/liaison officers. Financial and legal sectors also require analysts with life science knowledge for risk assessments, patents for molecular biology and biotechnology used for drug and medical applications. A postgraduate qualification with NIE for entry into teaching profession is also an option.

Graduates with Double Degree in Biomedical Sciences and Chinese Medicine are well positioned to consider careers in both Life Sciences/Biomedical Sciences and the Chinese Medicine industry. The majority are employed as Chinese Medicine Physicians (subject to passing the Singapore Chinese Medicine Practitioners’ Board Exam) as well as Management & Administration positions in Healthcare organisations and clinics, just to name a few. Some of our graduates are currently pursuing higher degree (Masters) in Chinese Medicine or research as PhD students at local universities.
HEALTHCARE
Tan Tock Seng Hospital, KK Women’s & Children’s Hospital, Jurong Health, Singapore General Hospital, Eu Yang Sang, Kin Teck Tong Clinic
E.g. Clinical Researcher, Management Associate, Hospital Executive, Healthcare Operations Executive, Pharmaceutical Sales, Physician, Acupuncturist, etc.

BIOMEDICAL & PHARMACEUTICAL
Lonza Biologics, Johnson & Johnson, Novartis Bio Pharma Operations, GlaxoSmithKline, Amgen
E.g. Process Engineer, Manufacturing Biotechnologist, QA Specialist, Clinical Researcher, R&D Officer, Validation Engineer, etc.

PUBLIC SECTOR
Ministry of Health, A*STAR, Genome Institute of Singapore, Institute of Molecular & Cell Biology, Ministry of Education, Singapore Police Force, National Environment Agency, KK Women’s & Children’s Hospital, SingHealth
E.g. Research Officer, Health Policy Analyst, Forensic Specialist, Project Officer, Laboratory Manager, Gynaecologist, etc.

BANKING, FINANCE & LEGAL
Citibank, Bank of America Merill Lynch, Deloitte & Touche, DBS Bank, Drew & Napier LLC, Moody’s Singapore
E.g. Risk Consultant, Relationship Manager, Management Associate, Patent Officer, Vice-President, Fixed Income Trader, Tax Consultant, etc.

ENTREPRENEUR
In Vitro, Aitreat, Archisen, BlazeRidge, Bio3D Technologies, TCMTREND
E.g. Owner of Bio 3D Printing Company, Owner & Physician of TCM Clinic

POSTGRADUATE STUDIES
Cambridge University, Duke-NUS Medical School, Nanyang Technological University, Karolinska Institutet, University of Edinburgh
E.g. Medical Student, M.Sc & Ph.D Student.

OTHERS
E.g. Scientific Writer, Communication Account Executive, Scientific Journalist, Marketing Associate, Events, Service Executive, etc.
SCHOOL OF

PHYSICAL AND
MATHEMATICAL
SCIENCES

SPMS recognises that the most exciting sciences and challenging problems of the 21st century will shift from the traditional disciplines to the interfaces of disciplines. The School offers eight rigorous 3-to 4-year Bachelor of Science (Honours) programmes, and students are taught and mentored by faculty doing cutting-edge research. The state-of-the-art facilities of the School provide an excellent environment for teaching, research and learning.

BACHELOR OF SCIENCE (HONOURS) IN CHEMISTRY AND BIOLOGICAL CHEMISTRY

Students are offered a direct honours programme that satisfies the American Chemical Society curricular guidelines for a rigorous professional education in chemistry. In addition to the core contents, students may also opt for concentrations in areas of Food Science and Technology, and Medicinal Chemistry. Plenty of enrichment courses are available, such as Forensic Science, Impact of Chemistry on Society and many more.
BACHELOR OF SCIENCE (HONOURS) IN CHEMISTRY AND BIOLOGICAL CHEMISTRY WITH SECOND MAJOR IN FOOD SCIENCE AND TECHNOLOGY (NANYANG SCHOLARSHIP PROGRAMME)

The Food Science and Technology Second Major programme is a collaboration between NTU and the prestigious Wageningen University from the Netherlands, whose Food Technology programme is considered one of the best and most innovative in Europe. It builds upon three of NTU’s existing BSc/BEng programmes, in which students will be awarded a certificate for the Second Major upon graduation.

CAREER PROSPECTS

Chemistry graduates can find ready employment in a wide range of chemical-related industries in Singapore and overseas. These include the biomedical and pharmaceutical industries, the petrochemical industries, polymer/paint/semiconductor industries and the food and beverage industry. A*STAR research institutes and other public sector agencies such as Health Sciences Authority and DSO National Labs are also eager employers. Many chemistry graduates have chosen a career in education, taking up the remarkable role of an educator who shapes the minds of the next generation.

BACHELOR OF SCIENCE (HONOURS) IN MATHEMATICAL SCIENCES

This programme offers a good mix of fundamental, as well as the applied, computational, and the industrial aspects of Mathematics and Statistics. Students undergo 18 months of foundational courses; thereafter they will choose their specialisations either in the Statistics stream, the Pure Mathematics stream, the Applied Mathematics stream or the Business Analytics stream. The emphasis of this degree lies in breadth, flexibility and relevance.

BACHELOR OF SCIENCE (HONOURS) IN MATHEMATICAL SCIENCES WITH MINOR IN FINANCE

The use of mathematical methods has now become widespread in all areas of finance and economics, and the Minor in Finance in addition to a Major in Mathematical Sciences is designed to respond to this demand and to give an edge to the mathematics student. This Minor is offered by the Nanyang Business School, exclusively to selected Mathematical Sciences students who will be taking additional courses in Banking and Finance.
DOUBLE MAJOR: *NEW!
**BACHELOR OF SCIENCE (HONOURS) IN MATHEMATICAL SCIENCES AND ECONOMICS**

This highly inter-disciplinary programme, in partnership with the School of Social Sciences, shapes our students into individuals with the skills most sought-after by the financial services industry. Other than the common foundational courses, the emphasis in the later study of Mathematics will be the numerical, computational and statistical methods. For Economics, quantitative techniques and the fundamental economic concepts will be emphasised. This programme provides students with strong interdisciplinary skillsets. With a strong background in statistics and economics, graduates from this programme will also find themselves well prepared for further studies in Economics.

**CAREER PROSPECTS**

Mathematics graduates often play a leading role in fields as diverse as finance, I.T, biotechnology, and many others. Attesting to the versatility of a mathematical training, it is very common for mathematicians to obtain jobs with titles like “Risk Analyst”, “Actuary”, “Clinical Trials Manager”, “Epidemiologist” and countless others. Mathematics gives you a superb foundation for later specialization, and a set of analytical skills that would be valued by any employer.

**BACHELOR OF SCIENCE (HONOURS) IN DATA SCIENCE AND ARTIFICIAL INTELLIGENCE  *NEW!***

In collaboration with the School of Computer Science and Engineering (SCSE), this programme equips students with a strong foundation in mathematics, statistics and computer science and prepares them for a career in the rapidly expanding field of data science and artificial intelligence (AI) as data scientists or AI scientists.

Students will study core courses in Mathematical Sciences and well as Computer Sciences to build up foundation and develop interdisciplinary insights. In the later part of the programme, students will deepen their understanding by reading more advanced topics such as optimization, regression analysis, high-dimensional statistics, data mining, machine learning and cryptography. Riding on the wealth of NTU’s strong collaboration with the industry, students will also benefit from participation in internship and industry oriented research project.
CAREER PROSPECTS

As the demand for data science and artificial intelligence (DSAI) specialists is growing rapidly, DSAI graduates can expect a rewarding career as a data science expert or an AI specialist across various sectors, ranging from government agencies such as health care and transportation authorities, to industry players such as e-commerce, infocomm and financial services sector.

BACHELOR OF SCIENCE (HONOURS) IN PHYSICS

The Physics degree is designed to equip students with solid analytical and computational skills, while recognising the needs to prepare them with strong experimental training. Emphasis is placed on the core content of the course, which focuses on conceptual and fundamental knowledge as well as lab based trainings and experiments. Students may also opt to concentrate in Nanotechnology.

BACHELOR OF SCIENCE (HONOURS) IN PHYSICS WITH SECOND MAJOR IN MATHEMATICAL SCIENCES

Alongside a first major in Physics, outstanding students may apply for admission to the degree programme which allows them to pursue a second major in Mathematical Sciences. This second major allows students to acquire a strong mathematical foundation to prep them for graduate studies in theoretical and computational physics.

BACHELOR OF SCIENCE (HONOURS) IN APPLIED PHYSICS

After undergoing the foundational courses, students majoring in Applied Physics will undergo courses that emphasize the physical principles that are critical in driving frontier technology and applied research. The Applied Physics majors also enjoy the opportunity to opt for a concentration in areas of Nanotechnology, Optical Technology, Semiconductor Technology and Biophysics.

CAREER PROSPECTS

Physics graduates are rewarded with a wide choice of careers. The key objectives of our educational programme are creativity, active collaboration and effective communication. Supplemented by exposure to research and work attachments, this ensures employability of all our graduates. Critical analysis, quantitative reasoning and problem-solving skills acquired in the programme are coveted by a variety of employers like research organisations, semiconductor industries, optics and displays, equipment manufacturers and many more.
HOW WILL A GOOD STUDENT BE CHALLENGED?

GOH HUI TING
Year 2, Biological Sciences
CN Yang Scholar,
Hwa Chong Junior College alumnus, Singapore

CN YANG SCHOLARS PROGRAMME

The CN Yang Scholars Programme (CNYSP), named after Professor CN Yang (Nobel Laureate in Physics 1957), is specially designed for exceptional students who have a deep passion for research in science and engineering fields. Highly competitive with only 50 students selected annually, the CNYSP offers a rigorous and intensive multidisciplinary curriculum that encompasses all branches of science and mathematics. The programme is also tailored to provide students with multitudinous opportunities in research, both locally and overseas. In particular, the overseas Final Year Projects and research attachments serve to broaden the scholars’ global perspectives. At the end of the undergraduate study, CNYSP graduates are given an option to pursue postgraduate study (PhD) with a scholarship in NTU or Joint PhD overseas.

“Under the CNYSP, I am blessed with numerous opportunities to explore research. CNYSP’s interdisciplinary curriculum has allowed me to appreciate the other Science and Engineering disciplines, therefore paving the pathway to a future of collaboration between researchers of different backgrounds.”
BAI ZHONGZHENG
Year 4, Mathematics and Economics
Hwa Chong Institution alumnus, Singapore

UNDERGRADUATE RESEARCH EXPERIENCE ON CAMPUS (URECA)

URECA (Undergraduate Research Experience on CAmpus) is an research programme for second year and above undergraduate students who have achieved excellent academic standing. On this exclusive platform, undergraduate students are given an opportunity to work on a research project of their interest, and pursue independent research under the guidance and supervision of a professor over a period of eleven months (August to June). The programme allows students to immerse in a vibrant research culture and gain invaluable first-hand experience while earning monetary allowances or academic credits as well as other incentives. They will be awarded the coveted title of NTU President Research Scholar (NTU PRS) upon completion of the programme. By the end of URECA, NTU PRSs will gain a good appreciation of the open-endedness of research, formulation of research problems and possibly a nurture desire to pursue a higher degree through research and eventually choosing research as a career.

“The prestigious URECA programme is a great way to be immersed in the strong research culture at NTU! Not only are there tonnes of projects to choose from, you get to take ownership of a research project and even publish it!”
ARE THERE ANY OPPORTUNITIES FOR GLOBAL EXPOSURE?

CHRISTINA TAN EN HUI
Year 4, Biological Sciences (Integrated Programme)
Nanyang Scholar, Anglo-Chinese Junior College alumnus, Singapore
University of Manchester, the United Kingdom

Undergraduate students in the College of Science are offered the opportunity to learn, work and do research at some of the best universities. Students can tap into a network of over 350 partner institutions around the world. These help them to develop global perspectives besides broadening their learning experience.

The Office of Global Education and Mobility (OGEM) offers various outbound mobility opportunities that include the GEM Discoverer, GEM Explorer and the Overseas Attachment Programme offer various outbound mobility opportunities that include the GEM Discoverer, GEM Explorer and the Overseas Attachment Programme. Students may choose from a diverse range of study abroad options, depending on one’s budget and preferences.

GEM Discoverer offers four high quality learning programmes that place students globally for overseas internships (Work &
Study), summer studies, business/cultural executive programmes (*Prelude*) and language training (*Language Immersion*). Except the Work & Study programme, all programmes are conducted during university vacations (May – July and December), lasting from 2 to 6 weeks. Students will earn academic units upon successful completion.

GEM Explorer enables undergraduate students to take courses and do research in an overseas partner institution for one full-semester while exploring a new country and culture. They can earn academic units while broadening their global network and perspective. This programme allows students to go for exchange to over 350 universities in 45 countries all over the world. It gives them the global exposure needed to be the leaders of tomorrow.

The Overseas Attachment Programme, managed by NTU Career & Attachment Office, is a unique learning experience for students to experience life outside Singapore. Based on a strong partnership between NTU and the industry, the programme allows students to widen their perspective of the working world, enhance their employability and career mobility worldwide upon graduation.

POH QUAN LI

Year 4, Chemistry and Biological Chemistry Singapore Polytechnic Diploma alumnus University of Edinburgh, the United Kingdom

“It wasn’t just an academic exchange, it was an exploration of culture and the amazing wonders the world has to offer beyond our borders.”
HOW WILL I LEARN?

LECTURES AND TUTORIALS

Initial information is delivered in lectures to large groups of students within lecture theatres. Thereafter, students will break into smaller groups for tutorials to discuss materials presented in lectures. During tutorials which are mediated by faculty or senior postgraduate students, students have an opportunity to expand on concepts and theories introduced in the lecture, discuss the materials presented and apply newfound knowledge to current issues. Many courses are incorporated with interactive, engaging learning contents and activities under the Technology Enhanced Learning (TEL) programme. Leveraging on the latest developments in information technology and on novel pedagogical design principles, TEL utilizes learning activities that provide opportunities for learners to attain the knowledge and skills of the 21st century.

LABORATORY PRACTICALS

To promote a broad-based education, undergraduate students regularly participate in laboratory work which exposes students to cutting edge equipment and techniques. Students are also given opportunities to carry out research under the supervision of staff members during the semester break as well as through a semester-long intensive research project.

GROUP DISCUSSIONS

In addition to formal lectures and tutorials, undergraduate students are encouraged to meet with faculty for further discussion and clarification of lecture material. The College of Science prides itself on the dedication and open-door policy of all faculty who are ready to share information and foster learning. It is certainly not unusual to see students having regular meetings with faculty over lunch or coffee.

INDUSTRIAL INTERNSHIP

The internship provides an opportunity for students to get a taste of the working environment. Students will have the flexibility to choose to work with any of our industry partners. This is a good training ground for students to apply their knowledge in a real life situation. Working life provides the opportunity of enhancing one’s communication and interpersonal skills. Internship also helps students to make decisions about their career path.

RESEARCH PROJECTS

Students usually work independently on a full time research project during their final year of study. Such projects give all students a chance to put theoretical knowledge into practice and gain valuable research experience prior to graduation. Students will get to learn various experimental and problem solving techniques through research projects.
KICK-START YOUR CAREER
WITH CAREER & ATTACHMENT OFFICE

In today’s global and dynamic economy, competition for top jobs remain extremely competitive. To get noticed by employers and land your desired job, you will need the right career skills, guidance and networks.

With excellent connections to over 3,000 global and local industry partners, including multinational companies, top banks, small and medium enterprises and government agencies, NTU’s Career & Attachment Office (CAO) is well placed to give you an important head start on your dream career through purposeful internships and career-preparatory programmes. Our role is to equip students with essential employability skills.

To help you discover yourself and chart your career path, we have professional Career Coaches dedicated to helping CoS students. Apart from your Career Coaches, you will also be supported by CAO Career Consultants, Trainers and officers. A suite of resources, events and programmes designed to guide your career development are also available. They include CareerAxis (a one-stop career portal), industry and recruitment talks, career fairs, networking events with alumni and industry professionals, alumni mentorship, leadership development programmes and career workshops. In addition, CAO also connects you with employers and facilitates quality internship opportunities to help you gain relevant work experience.

The Margaret Lien Centre for Professional Success (MLCPS) offers all NTU students two mandatory credit-bearing online career preparatory courses to equip you with future-ready skills for the workplace and give you a competitive edge.

At CAO, our programmes inculcate the NTU values in students while helping them develop personal and professional work ethics. We develop and support you so that you can succeed in your career and community as a whole. Each student will be a global citizen with personal mastery in their career skills, and a relevant and confident contributor to society.

We wish you a positive start in your career journey. Find out more about CAO’s career services and internship opportunities at www.ntu.edu.sg/cao.
# ADMISSION REQUIREMENTS

FOR BACHELOR OF SCIENCE PROGRAMMES

## ASIAN SCHOOL OF THE ENVIRONMENT

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<th>PROGRAMME</th>
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<td>Environmental Earth Systems Science</td>
<td>At least H2 Level or equivalent pass in Mathematics and a H2 Level or equivalent pass in Physics, Chemistry, Biology, Economics or Computing</td>
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| Double Major in Environmental Earth Systems Science and Public Policy and Global Affairs | At least H2 Level or equivalent pass in Mathematics and a H2 Level or equivalent pass in Physics, Chemistry, Biology, Economics or Computing  
  Good grade in General Paper or Knowledge & Inquiry or H1 Level pass in History, English Literature or Geography |

## SCHOOL OF BIOLOGICAL SCIENCES

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<th>PROGRAMMES</th>
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| Biological Sciences/Biological Sciences with Second Major in Biomedical Structural Biological/Biological Sciences with Second Major in Medicinal Chemistry and Pharmacology Biological Sciences with Second Major in Business | At least H1/SL or equivalent pass in Mathematics and a good H2/HL or A Level equivalent pass in Physics, Chemistry or Biology  
  H2 Level pass in Chemistry |
| Biological Sciences with Second Major in Food Science and Technology       | At least H2 or equivalent pass in Mathematics and a H2 Level or equivalent pass in Physics, Chemistry or Biology  
  OR  
  At least H1 or equivalent pass in Mathematics and two H2 Level or equivalent pass in Physics, Chemistry or Biology |
| Biological Sciences with Second Major in Biomedical Materials              | At least H2/HL or equivalent pass in Mathematics and a H2/HL Level pass in Physics, Chemistry or Biology  
  SL/O Level or equivalent pass in Physics is applicable to applicants who have not read Physics at H2/H1 Level |
| Double Major in Biological Sciences and Psychology                         | Good H1/SL or equivalent pass in Mathematics, good H2/HL/ A Level or equivalent pass in Physics, Chemistry or Biology, and a good grade in General Paper or Knowledge & Inquiry |
| Biomedical Sciences/Chinese Medicine (中医学学士学位)                       | At least H1/SL or equivalent pass in Mathematics and a good H2/HL/ A Level or equivalent pass in Physics, Chemistry or Biology PLUS at least an O Level/SL or equivalent pass in Chinese Language |

## SCHOOL OF PHYSICAL AND MATHEMATICAL SCIENCES

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<th>MINIMUM SUBJECT REQUIREMENTS</th>
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</thead>
<tbody>
<tr>
<td>Chemistry and Biological Chemistry/Chemistry and Biological Chemistry with Second Major in Food Science and Technology</td>
<td>Good H2/HL/A Level or equivalent pass in Chemistry and either Mathematics or Physics</td>
</tr>
<tr>
<td>Data Science and Artificial Intelligence</td>
<td>Good H2/HL/A Level or equivalent pass in Mathematics and either Physics, Chemistry, Biology or Computing</td>
</tr>
<tr>
<td>Mathematical Sciences/Mathematical Sciences with Minor in Finance</td>
<td>Good H2/HL/A Level or equivalent pass in Mathematics</td>
</tr>
<tr>
<td>Double Major in Mathematical Sciences and Economics</td>
<td>Good H2/HL/A Level or equivalent pass in Mathematics and good grade in General Paper or Knowledge &amp; Inquiry</td>
</tr>
<tr>
<td>Physics/Applied Physics/Physics with Second Major in Mathematical Sciences</td>
<td>Good H2/HL/A Level or equivalent pass in Physics and Mathematics</td>
</tr>
</tbody>
</table>
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Information in the brochure is correct as of January 2018.