



**NANYANG  
TECHNOLOGICAL  
UNIVERSITY**  
SINGAPORE

**Asian School of the Environment**  
College of Science

# Asian School of the Environment



---

Environmental Earth Systems Science

Environmental Earth Systems Science and Public Policy and Global Affairs

Environmental Earth Systems Science with Second Major in Data Analytics

Environmental Earth Systems Science with Second Major in Sustainability

Environmental Earth Systems Science with Second Major in Entrepreneurship





# Asian School of the Environment



The Asian School of the Environment (ASE) is the home for environmental science at NTU. We integrate earth and environmental life science, ecology, engineering and technology, humanities, and the social sciences to address Asia and the world's key environmental challenges, including climate change, deforestation, natural disasters and sustainability. The ASE builds upon the strengths of the Earth Observatory of Singapore (EOS) and the Singapore Centre for Environmental Life Science Engineering (SCELSSE), two research Centres of Excellence within NTU.

You will learn skills to tackle the following big issues the world is facing today:



Human impact on the environment



Effects of climate change



Location and management of natural resources



Forecast and mitigation of natural hazards



Sustainability



Earth processes and functions



Biodiversity and conservation



## Why ASE?

- ✔ Favour small cohort that encourages an innovative and interactive learning environment
- ✔ Close interaction with faculty and faculty work individually with students on career counselling
- ✔ Field Experience and Overseas opportunities
- ✔ Opportunity to conduct an independent final-year research project in collaboration with a faculty advisor
- ✔ Conduct a professional internship with industrial attachment with a local or overseas employers
- ✔ Real world application of skills and concepts taught in classes



# Programmes Offered



## Environmental Earth Systems Science (EESS)

Gain a strong background in quantitative skills such as spatial analysis, core science and modern computing techniques, while applying these skills through critical thinking, communication, and collaboration. Within this programme, students can specialize in Geosciences, Ecology and Ecosystems or Society and the Earth Systems.



## Environmental Earth Systems Science and Public Policy and Global Affairs (ESPP)

Develop a strong background in quantitative environmental earth systems science (EESS) and communication, public affairs, and international relations, providing students with the opportunity to build complementary skills in leadership, collaboration, and innovative problem-solving.



## Environmental Earth Systems Science with a 2<sup>nd</sup> Major in Data Analytics (ESDA)



Build a strong background in quantitative environmental earth systems science (EESS) and statistics, algorithms, and data analytics, enabling students to gain actionable insights that complement the research aspect of EESS.



# Programmes Offered



## Environmental Earth Systems Science with a 2<sup>nd</sup> Major in Sustainability (ESSN)

Allows students to understand how our environment, economy and society interact. By applying this knowledge to technological innovation and communicating readily with decision-makers, we can maintain the health of our world for the benefit of current and future generations.



## Environmental Earth Systems Science with a 2<sup>nd</sup> Major in Entrepreneurship (ESET)

This programme equips students with fundamental entrepreneurship competency, which broadens their understanding of enterprise and innovation and enriches them to deal with uncertainties in the VUCA and be the driver of technology innovation.



## Minor in Environmental Sustainability

Students will receive the most up-to-date scientific background to the environmental challenges that will shape our future. This includes the relationship between humans and the natural world, the availability and management of natural resources,

# Interdisciplinary Collaborative Core (ICC)

The key elements of ICC curriculum and pedagogy are as follows:

- Interdisciplinary – content is developed and taught by faculty from different disciplines and integrated to understand issues from various perspectives
- Collaborative – students discuss and work in interdisciplinary teams on problems, projects or assignments
- Core – learning outcomes are aligned to the 3Cs (Character, Competence, Cognitive Agility) of NTU graduates.

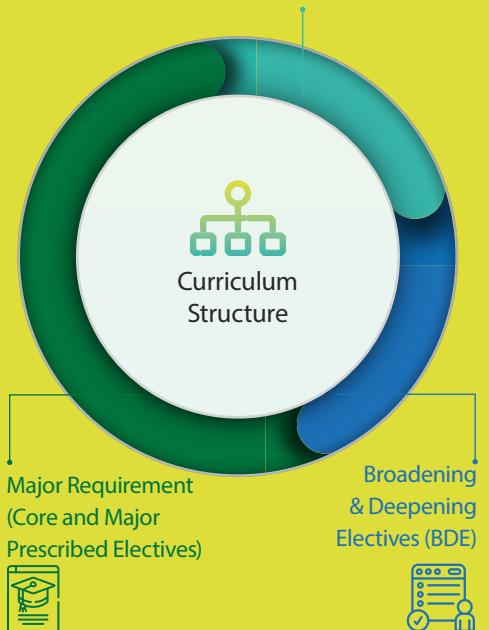


ICC courses include:

- ✓ 7 Core Modules focusing on Key Transferable Skills and Grand Challenges
- ✓ Foundational Core Courses including Effective Communication, Digital Literacy, and a Mandatory Professional Attachment
- ✓ Co-curricular Modules



Interdisciplinary Collaborative Core (ICC)





# ASE Field Courses



Work in the field is a key part of the undergraduate studies ASE. We believe that field studies provide an understanding of the Earth and environment that cannot be gained from classroom studies alone. With this opportunity, our students will be able to:

- Connect concepts learned in the classroom with the real world
- Learn cutting-edge techniques used in scientific research
- Engage with the world around them
- Connect with faculty and fellow students in a collaborative and fun environment

## Introductory Field Course

After their first year of study, all students will participate in a 2 weeks introductory field course. This field course is designed for them to experience all three specialisations (ecology, society, and geoscience), giving them a better idea of the specialisation to go into.



Mount Batur - Geoscience



Padang Bai - Ecology



Ubud - Society

## Advanced Field Courses

Students will have the opportunity to participate in overseas advanced field courses, depending on the specialisations they have chosen.



Taiwan - Ecology



California - Geoscience



Sri Lanka - Ecology/Society

Note: Fieldwork locations are subjected to changes

# Curriculum Overview for EESS



## EESS Core Modules:

- Environment & Society
- Solid Earth
- Biosphere
- Climate Change
- Introductory Field Experience
- Computational Earth Systems Science
- GIS and the Earth System
- Calculus for the Sciences
- Physical Environments of Singapore
- Introduction to Scientific Writing



## Specialisation Core Modules:

- Earth Materials
- Structural Geology and Tectonics
- Sedimentary Geology
- Geochemistry and Geophysics
- Field courses in Geology



Geosciences

- Bioinformatics & Statistics
- Microbes on Natural Ecosystem
- Heredity & Genetics
- Plant & Animal Physiology
- Conservation Biology & Biodiversity
- Experimental Design & Data Analysis
- Field courses in Ecology



Ecology and Ecosystems

- Field courses in Society and the Earth Systems
- Law & Economics, Sustainable Development, and Environmental Protection
- Data Analysis
- Global Environmental Politics and Governance
- Coupled Human and Natural Systems
- Principle of Economics
- Resilient Urban Systems



Society and the Earth Systems

\*Electives for Honours Eligibility (by application):  
Final Year Project





# Curriculum Overview for ESPP



## EESS Core Modules:

- Environment & Society
- Solid Earth
- Biosphere
- Climate Change
- Introductory Field Experience
- Computational Earth Systems Science
- GIS and the Earth System
- Calculus for the Sciences
- Physical Environments of Singapore
- Introduction to Scientific Writing



## EESS Society Specialisation Modules:

- Law & Economics, Sustainable Development and Environmental Protection
- Data Analysis
- Global Environmental Politics and Governance
- Coupled Human and Natural Systems
- Resilient Urban Systems
- Principle of Economics



## PPGA Core Modules:

- Introduction to International Relations and Foreign Policy
- Introduction to Political Theory
- Politics of Singapore
- Introduction to Public Administration and Policy
- Fundamentals of Politics



Environmental Earth Systems Science and Public Policy and Global Affairs





# Curriculum Overview for ESDA



## EESS Core Modules:

- Environment & Society
- Solid Earth
- Biosphere
- Climate Change
- Introductory Field Experience
- Computational Earth Systems Science
- GIS and the Earth System
- Calculus for the Sciences
- Physical Environments of Singapore
- Introduction to Scientific Writing



Either Geosciences or Ecology and Ecosystems or Society and the Earth Systems Specialisation Courses



Environmental Earth Systems Science with a 2<sup>nd</sup> Major in Data Analytics



## DA Courses:

- Probability and Statistics
- Linear Algebra
- Data Analysis/ Computing
- Algorithms
- Database
- Data Mining
- Data Visualisation/ Management





# Curriculum Overview for ESSN



## EESS Core Modules:

- Environment & Society
- Solid Earth
- Biosphere
- Climate Change
- Introductory Field Experience
- Computational Earth Systems Science
- GIS and the Earth System
- Calculus for the Sciences
- Physical Environments of Singapore



Either Geosciences or Ecology and Ecosystems or Society and the Earth Systems Specialisation Courses



Environmental Earth Systems Science with a 2<sup>nd</sup> Major in Sustainability



## Sustainability Course Requirements

Students are required to complete:

- 1 core course in each knowledge area (People, Planet, Profit, Practice and Policy)
- Sustainability elective courses
- Interdisciplinary project

\*A minimum total of 30 AU has to be completed (core courses + electives + interdisciplinary project)



# Curriculum Overview for ESET



## EES Core Modules:

- Environment & Society
- Solid Earth
- Biosphere
- Climate Change
- Introductory Field Experience
- Computational Earth Systems Science
- GIS and the Earth System
- Calculus for the Sciences
- Physical Environments of Singapore



Either Geosciences or Ecology and Ecosystems or Society and the Earth Systems Specialisation Courses



## Entrepreneurship Course Requirements

Students are required to complete:

- Compulsory Entrepreneurship courses
- Entrepreneurship elective courses
- Compulsory experiential programme



Environmental Earth Systems Science with a 2<sup>nd</sup> Major in Entrepreneurship





# Exciting Career Opportunities



## Environment and Conservation

- Academic research
- Environmental media and journalism
- Non-Government Organizations and Volunteer-Welfare Organizations such as WWF, Nature's Society or Birdlife
- International Governance such as World Food Bank or UNESCO



## Entrepreneurship & Finance

- Where firms seek quantitative knowledge about the science that drive changes in the energy market.
- Reinsurance companies, who rely on a balance of earth science data and policy intuition to help assess longterm risk



## Private Sector

- Natural resource exploration, extraction, and management (oil, gas, and minerals)
- Environmental consulting
- Geotechnical consulting
- Geologic surveying or monitoring



## Public Sector

- Foreign and domestic policy
- Government roles in Environmental Planning, Policy and Management
- Water resource management or hydrogeology
- Teaching

## Postgraduate Studies

- Our graduates have gone on to Masters and PhD studies in some of the world's top institutions, including Harvard, Caltech and UCLA, studying issues such as Climate Change and Physical Science



## Business & Sustainability

- 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
- Sustainability reporting



# Admissions

Students will be evaluated on an oral interview and academic background. ASE undergraduate programmes accept 'A' Level, IB, NUSHS Diploma, Polytechnic Diploma, and other equivalent international qualifications on a selective basis. All candidates with strong academic potential who satisfy the minimum subject requirements as well as the general admission requirements set by NTU will be considered.

## Minimum Subject Requirements:

Programme	Environmental Earth Systems Science	Environmental Earth Systems Science and Public Policy and Global Affairs (Double Degree)	Environmental Earth Systems Science with a 2 <sup>nd</sup> Major in Data Analytics
Singapore Cambridge 'A' Level	<ul style="list-style-type: none"> <li>H1 Level Pass in Mathematics AND</li> <li>H2 Level Pass in Physics/Chemistry/Biology/Economics/Computing</li> <li>A good grade in General Paper/Knowledge &amp; Inquiry/H1 Level History/English Literature/Geography (For ESPP students only)</li> </ul>		<ul style="list-style-type: none"> <li>H2 Level pass in Mathematics AND</li> <li>H2 Level pass in Physics/Chemistry/Biology/Computing</li> </ul>
IB Diploma	<ul style="list-style-type: none"> <li>Mathematics at Standard Level AND</li> <li>Physics/Chemistry/Biology/Economics/Computer Science at Higher Level</li> <li>A good grade in English at Standard Level (for ESPP students only)</li> </ul>		<ul style="list-style-type: none"> <li>Mathematics at Higher Level AND</li> <li>Physics/Chemistry/Biology/Computer Science at Higher Level</li> </ul>
NUS High School Diploma	<ul style="list-style-type: none"> <li>Major CAP of 2.0 in Mathematics AND</li> <li>Major CAP of 2.0 in Physics/Chemistry/Biology</li> <li>Good Overall CAP in English Language (for ESPP students only)</li> </ul>		<ul style="list-style-type: none"> <li>Major CAP of 2.0 in Mathematics AND</li> <li>Major CAP of 2.0 in Physics/Chemistry/Biology</li> </ul>
International and other qualifications	<ul style="list-style-type: none"> <li>Additional Mathematics at Junior High School AND</li> <li>Physics/Chemistry/Biology/Economics at Senior High School</li> <li>A good grade in General Paper/English at Senior High School Level (for ESPP students only)</li> </ul>		<ul style="list-style-type: none"> <li>Mathematics at Senior High School Level AND</li> <li>Physics/Chemistry/Biology at Senior High School Level</li> </ul>

Scan the QR code to learn which polytechnic diplomas are eligible for our programme.

Contact us for more detailed information about admissions:  
[ase\\_undergrad@ntu.edu.sg](mailto:ase_undergrad@ntu.edu.sg)





# Overseas Opportunities

## Field Experience



- Participate in a 2 weeks introductory field work course after the first year of study
- Advanced students have opportunities to participate in longer field work courses abroad in places like Malaysia, Indonesia, Taiwan or California

Note: Fieldwork locations are subjected to changes

## Overseas Entrepreneurship Programme (OEP)



- Acquire invaluable skills through start-up internships, international immersion, and entrepreneurship experience
- Students have the chance to gain the experience, know-how, contacts, and skillsets they need to kick-start their own entrepreneurial journey

## Exchange Programme



- Students are encouraged to study abroad for one or two semesters on an exchange programme with our partner universities in Australia, Canada, East Asia, Europe, New Zealand, the United Kingdom, and



# Testimonials from Our Students



“I embarked on my semester exchange at the University of Waterloo, ON. Aside from completing my modules, it was a thrilling experience to be overseas for a semester and I had the opportunity to explore Canada’s nature through road trips and forged meaningful friendships. I experienced the transition from Fall to Winter (which is something we do not get in Singapore) and picked up ice skating as a leisure activity. Needless to say, exchange was the highlight of my undergraduate studies.”

Ng Jing Yi, Stephanie

“The MSRDP grant allowed me to conduct my own marine science research and furthered my interest in corals. I had the opportunity to explore the mysteries surrounding the blue coral which was extremely fulfilling and eye-opening. This research experience has prepared me numerous skills which will be beneficial for me as I progress forward into the working world or towards graduate schools. The technical and social aspect of skillsets that I have acquired during this journey is definitely worth the time and effort that I’ve spent in this project.”

Leon Sun

“During my month-long summer program at the University of British Columbia in Canada, I made friends from around the world, got the chance to explore Vancouver and the Rockies, and had a fantastic time there! I also enjoyed the hands-on classes under the School of Community and Regional Planning at UBC.”

Teo Zhi Ying

“Being an adventurous soul, I’ve always loved gaining new experiences in science and research and being in ASE gave me many opportunities to do so. Here in ASE, our professors encourage us to reach for the stars and we are always able to seek for advice and guidance from them. My exchange in Sydney, Australia was really meaningful as I was able to learn new skills and experience marine research in a completely different environment and ecosystem from Singapore through the Undergraduate Research on Campus Experience (URECA). During my final summer as an undergraduate, I also had the opportunity to be involved in sea turtle research and conservation work in Northern Cyprus for a month through the Marine Science Research and Development Programme (MSRDP). These experiences enabled me to see my passion in research and conservation and motivated me to embark on my final year project this year focusing on the hawksbill turtles in Singapore.”

Regine Tiong



# Scholarships & Financial Aid

## The Nanyang Scholarship

Awarded to students who excel academically, with strong leadership potential and outstanding CCA track records.

- ✔ Full coverage of subsidised tuition fees (after Tuition Grant).
- ✔ Living, accommodation and computer allowance.
- ✔ Travel grant for an overseas programme.
- ✔ Priority for Overseas Programme.
- ✔ Participation in Scholars Orientation Programme, Scholars Award Ceremony, Outreach Programmes, and Eminent Speaker Series.

## The College Scholarship

Awarded to outstanding freshmen pursuing full-time undergraduate programmes in NTU.

- ✔ Full coverage of subsidised tuition fees (after Tuition Grant).
- ✔ Living allowance.

## The School Scholarship

Awarded to outstanding freshmen pursuing full-time undergraduate programmes in NTU.

- ✔ Full coverage of subsidised tuition fees (after Tuition Grant).







## Treis ASE Scholarship

Awarded to outstanding freshmen pursuing full-time undergraduate programmes in NTU.

- ✓ Full coverage of subsidised tuition fees (after Tuition Grant).



For enquiries pertaining to financial assistance:

- ☎ (65) 6790 4115
- ✉ [FinAid@ntu.edu.sg](mailto:FinAid@ntu.edu.sg)

For enquiries pertaining to scholarships:

- ☎ (65) 6790 6766
- ✉ [ug\\_scholarships@ntu.edu.sg](mailto:ug_scholarships@ntu.edu.sg)

For enquiries pertaining to CN Yang Scholars programme:

- ☎ (65) 6514 1900
- ✉ [d-cnyang@ntu.edu.sg](mailto:d-cnyang@ntu.edu.sg)

For enquiries pertaining to University Scholars Programme (USP):

- ☎ (65) 6908 3345
- ✉ [usp@ntu.edu.sg](mailto:usp@ntu.edu.sg)





# Testimonials from our Alumni



“I have always been impressed by how students’ interests and learning has always been at the heart

of the ASE faculty. The faculty has been extremely receptive to our feedback, with constant improvements made to the curriculum based on present-day developments. I recalled how the faculty designed a field trip curriculum to palm oil plantations from scratch, after students of the Society specialisation students expressed their desire for more field exposure.

ASE has been supportive of my personal growth – I had the opportunity to pursue multiple internships during the duration of my undergraduate life and was granted time off classes to attend regional conferences. There is a high level of flexibility in the ASE programme as well as I could always choose to work on a diverse range of topics that interest me for ASE modules.

I am thankful to be placed in this faculty which opened my eyes to the wonders of the world we live in today through the multiple field trips in and out of Singapore. Most importantly, ASE taught me how to learn through questioning and reignited my passion for learning. ”

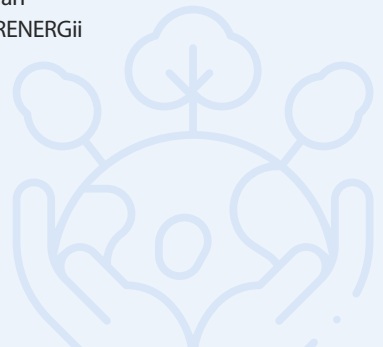
Chua Ying Xuan  
Alumni, EESS



“I’m currently working as an Analyst at RENERGii; a venture-building, innovation and

advisory start-up that functions in the sustainability sector. My work goes into making urban cities more sustainable by employing circular economy strategies. Working in a start-up is very dynamic and I have found myself involved in a range of roles and activities. I can be helping to build an insect farming business one day, organising a zero waste design workshop the next and pouring through literature the next week. ASE and the faculty has helped me in this job by building my foundation to analyse and tackle environmental problems. In particular, I have employed the use of systems thinking, stakeholder management and the analytical frameworks taught to me at ASE. My research skills gained from working on projects with ASE faculty has also been particularly useful in my role as an analyst, allowing me to easily handle and summarise research into succinct findings for real life usage. ”

Jaslyn Chan  
Analyst, RENERGii





“Prior to my graduation, I completed an ASE internship with Sentosa Development Corporation

to incorporate geology as a new frontier in nature outreach. My positive experience has propelled my interest in planning for Sentosa’s future developments as part of the Sentosa-Brani Master Plan.”

Foo Zhen Hui  
Member of the 2019 Sentosa Graduate Development Programme



“My experience with ASE has allowed me to gain a deeper understanding of natural

disasters occurrence in the Asia Pacific region through the Geoscience field trips and the research experience I had in earthquake modeling. This has benefited me greatly for my role now in analysing crisis that are occurring around the world and their impact on the community.”

Miranda Ong  
Crisis Response Analyst APAC at Facebook (SRS)



“My work revolves around sustainability reporting and encouraging the bank to improve its environmental

and social impacts, based on the policies and processes in place. Lessons from ASE on complexity and systems science are valuable in understanding the interdependencies in environmental, social issues and business considerations.”

Eunice Tan  
Sustainability Executive at DBS



# Asian School of the Environment



Nanyang Technological University  
50 Nanyang Avenue  
Block N2-01c-35  
Singapore 639798



[www.ntu.edu.sg/ase](http://www.ntu.edu.sg/ase)



[ase\\_undergrad@ntu.edu.sg](mailto:ase_undergrad@ntu.edu.sg)



EARTH  
OBSERVATORY  
OF SINGAPORE

An Institute of Nanyang Technological University

**SCELSE**

Singapore Centre on  
Environmental Life Sciences Engineering