



Course/ Programme Title: The Power and Possibilities of AI

Date: 16 - 19 Dec 2025

Overview

Discover the Future of AI at NTU during this Winter Programme

Step into the world of innovation at Nanyang Technological University (NTU), one of the world's top young universities. This 4-day winter programme invites high school students to explore the exciting possibilities of artificial intelligence (AI) and experience campus life in Singapore.

Taught by an NTU professor, you will explore key AI concepts and see how this technology is shaping fields such as sports, finance, education and healthcare. Today's high school students will be stepping into a workforce integrating open source ecosystems such as DeepSeek into every facet of their professional and daily lives. With this democratised access to AI and hopeful global solidarity, it is imperative that they gain an early exposure to these technological applications.

NTU student ambassadors will lead a guided campus tour for participants, offering a personal and authentic glimpse into university life. As part of the programme, a dedicated campus tour for parents will be held on the first day, offering parents an exclusive opportunity to explore NTU's vibrant campus firsthand.

Participants will embark on a learning journey that includes visits to NTU cutting-edge research labs and an industrial visit, alongside informative sessions such as an admissions talk by NTU's Office of Admissions staff. This experience offers valuable insights into university pathways and real-world innovation.

You will have the chance to visit iconic Singapore landmarks, including Merlion Park, Esplanade and Singapore River, which offer a vibrant taste of the city's culture and energy.

This programme provides a valuable opportunity to deepen your understanding of AI, gain fresh perspectives and experience life at a leading global university. Take this chance to spark your curiosity and build confidence as you explore the possibilities ahead.

Important Dates - We're Here to Support You

- **Wednesday 1 October 2025 at 8pm SGT:** Join our Online Information Session, a perfect opportunity to ask questions and feel confident about the programme fit before registering.
- **Thursday, 27 November 2025 at 8pm SGT:** For confirmed participants, the Online Pre-Programme Briefing will help you get ready for the programme at NTU.

What You Can Look Forward To At



NTU Robotics Research Centre

A disruptive enabler for healthcare and sustainable urban environments - the world of the future.

Three types of robots to witness in person:



AutoBot:

Intelligent vehicular structure with in-built sensors to detect information

Bio-Hybrid Robot:

Insect-computer hybrid designed for search and rescue missions in challenging terrains

Expression Display & Gesturing Avatar Robot (EDGAR):

Humanoid for social interaction and learning

The centre's three research focus areas:



Mobility:

Walking, tracking, multi-directional drives, biomimic drives

Perception:

Recognising and detecting scenery

Interaction:

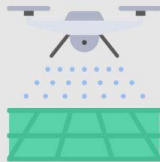
User interface & safety, robot-robot interaction

ROBOT RESEARCH APPLICATIONS

Robots are not just for the future, but already functioning and value-adding in many fields and industries today. Here are some innovative ways in which autonomous devices have been employed.

Different fields and industries

Security



Cyborg insect with micro-controller is capable of navigation and human presence detection in an unstructured environment.

Vehicular Sports



NTU debuted F1 racing and flying cars at Autonomous Racing League in Abu Dhabi in 2024.

Logistics



Aerial delivery platform for scalable urban logistics, with integrated motors, batteries and controllers.

Infrastructure



Automated robot system for indoor and outdoor high-rise spray painting and cleaning, allowing the time-consuming and hazardous task to be fully mechanised.

Healthcare



Portable assistive robot for the rehabilitation of post-stroke patients and people with disability with minimal supervision and fall prevention competency.



Xperience@EEE

TECHNOLOGICAL APPLICATIONS IN GAMIFICATION

1 What is the venue about?

It is the first technology-enabled escape room in the world. Players collaborate to complete the mission with the integration of motion detectors, holographic projections and laser systems.



2 Innovative applications

Some of the technological applications employed include facial recognition, optofluidics, neural network, Internet of Things, AR/VR, machine learning, radio-frequency identification and magnetic sensing.

3 Advanced software used

Look forward to Raspberry Pi, Python and Arduino at work, all ideated and executed by NTU undergraduate students!



Key Benefits

- Build a foundational introduction to artificial intelligence concepts.
- Explore how AI is applied across various industry sectors through real-world examples.
- Participate in guided activities designed to deepen understanding.
- Visit NTU's state-of-the-art research & lab facilities where innovation comes to life through prototypes and research.
- Experience an industrial visit.
- Connect and collaborate with a diverse group of motivated peers.
- Discover insights into NTU's undergraduate programmes.
- Enjoy a memorable glimpse into life at a world-class university.
- Explore some of Singapore's iconic landmarks.

Why this programme?

Learn from an NTU professor in a supportive environment that sparks curiosity and creativity. Discover AI's real-world impact and ignite your passion for future opportunities. Experience university life in vibrant Singapore, a global hub for technology, business, and innovation.

What will the programme cover?

Course Outline

- **Introduction to AI and its Impact**

Introduce students to AI, its basic concepts, and its potential impact on society

- Welcome & Overview: Brief on program goals and schedule.
- Introductory Lecture on AI: Cover the basics of AI, including machine learning, deep learning, and data science. Explain terms and give real-world examples (e.g., recommendation engines, language processing).
- Discussion on AI in Society: Explore AI's impact on various fields — medicine, entertainment, environmental science, education, self-learning, etc. Small groups discuss how they've seen AI in their daily lives.
- Activity: Students interact with online AI demos (like Google's Teachable Machine) and share their experiences.

- **Data-Analytic Thinking**

Equip students with the essential skills in data handling and analysis, enabling them to effectively manage, explore, and present data for their AI projects.

- The Data Pipeline: Understanding types of data, data acquisition, and preparation.
- Data Exploration: Basic concepts in statistics and exploratory data analysis (EDA) using case studies.
- Data Presentation: Techniques for data visualisation and statistical analysis.

- **AI Technologies**

Understand Artificial Neural Networks (ANN) and Backpropagation, Multi-layer Perception, Deep Learning, and Various Architectures.

- Lecture on Neural Networks: Introduction to ANN and backpropagation.
- Deep Learning Architectures: Overview of CNN, RNN, and Transformer architectures.
- Hands-On Activity: Implementing a simple neural network using TensorFlow.

- **Applications of AI in Different Fields**

Explore the applications of AI across various fields and inspire project ideas.


- Lecture on AI Applications: Overview of how AI is used in fields like sports, finance, education and healthcare.
- Field-Specific Breakout Sessions: Students choose one field of interest (e.g., entertainment, environment or healthcare) and join a mini-workshop on AI's role in that field.
- Case Study Discussion: In groups, students discuss a notable AI application in their chosen field, exploring its development and impact.

- Project Brainstorming: Students are guided through brainstorming for a small AI project. Teams form and settle on project ideas (e.g., a chatbot, simple prediction model).
- **Project Development and Presentation**
Complete project work and showcase it to peers.
 - Project Work Session: Students work in teams to develop their projects. The instructor will offer guidance, helping students to troubleshoot and implement their ideas.
 - Student Presentations: Each team presents their project to the group, explaining the inspiration, process, and potential impact of their project.
 - Reflection and Closing Discussion: Students discuss their learning takeaways, challenges, and excitement about AI. The program concludes with awards or certificates

This enhanced curriculum will motivate students to work closely with data, make data-driven decisions, and explore cutting-edge applications in AI and data science. **Python will be the primary language for hands-on computational techniques.**

Exciting Tours & Learning Journey

- **NTU Campus Tour** - Explore NTU's vibrant campus with our student ambassadors and experience a glimpse of university life.
- **Sharing by NTU Office of Admissions** - A valuable opportunity to learn more about NTU's undergraduate programmes and admissions criteria.
- **Innovation Learning Journey** - Visit NTU's state-of-the-art research & lab facilities where ideas and research come to life through prototypes and early experimentation.
- **Industrial Learning Journey** - Gain insights into how technology is explored and applied in real-world settings through a visit to an industrial firm.
- **Singapore City Highlights** - Discover iconic locations such as Merlion Park, Esplanade and Singapore River. Enjoy a free-and-easy experience of the city's culture and charm.

Location	Description
Robotics Research Centre (RRC) 	<p>The Robotics Research Centre (RRC) was established in 1994 as a university centre with MAE, EEE and SCE as participating schools. It is the first interdisciplinary research centre on robotics in Singapore.</p> <p>The interdisciplinary nature of robotics makes it a disruptive enabler for promoting productivity leading to economic growth, for ensuring sustainability of complex urban environments, for the urgent healthcare needs in an ageing society, as well as for safety and security worldwide.</p>

Xperience@EEE



Xperience@EEE is a pioneering, technology-enabled escape room built entirely by undergraduates from Nanyang Technological University's School of Electrical and Electronic Engineering. Recognised as the first of its kind worldwide, it challenges participants to collaborate and solve puzzles using wit and creativity. Advanced features such as motion detectors, holographic projections and laser systems deliver a unique blend of engineering ingenuity and immersive gameplay.

Industrial Visit



This industrial visit offers participants an introduction to developments in no-code AI and video analytics. The programme will include an overview of the technology landscape, digital transformation, and basic concepts in artificial intelligence and computer vision. Participants will have the opportunity to see demonstrations of AI-driven video analytics and ask questions during a Q&A session.

The visit also includes a tour of unmanned technology booths, offering participants the opportunity to see examples of AI, robotics, virtual reality, and other emerging technologies.

NTU Campus Tour



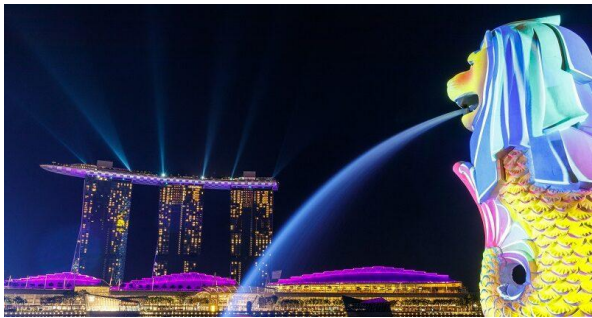
The NTU campus tour highlights key innovations such as The Hive, with its eco-friendly design and collaborative learning spaces, and Wee Cho Yaw Plaza, a net-zero energy timber building. Visitors also experience NTU's Smart Campus vision in person, which integrates sustainable architecture and smart technologies to drive the university's goal of carbon neutrality by 2035.

Singapore River



Take a leisurely walk along the river where heritage meets the modern city. You will come across charming bridges, restored shophouses and lively cafes. It is a great place to take photos and simply experience the energy of the waterfront.

Merlion Park



No visit to Singapore is complete without seeing the iconic Merlion, a mythical creature with a lion's head and a fish's body. As you arrive at Merlion Park, prepare for breathtaking views of the Marina Bay Sands and other modern architectural marvels that define Singapore's skyline. The Merlion, a symbol of Singapore's humble origins as a fishing village and its lion-inspired name, is the perfect spot for photos. Your guide will share insights into the meaning behind this symbol and how it has become an emblem of Singapore's growth and resilience.

Esplanade



The Esplanade – Theatres on the Bay, affectionately known as “The Durian” due to its distinctive, spiky architectural design. As one of Asia's leading cultural centres, the Esplanade hosts world-class performances and events year-round. Even if you don't catch a performance, the Esplanade's architecture alone is mesmerising.

Programme Schedule

16 Dec 2025 (Tuesday)	17 Dec 2025 (Wednesday)	18 Dec 2025 (Thursday)	19 Dec 2025 (Friday)
9am – 9.15am Meeting point at NTU 9.30am – 11.30am Welcome Session & Programme Briefing Lecture: Introduction to AI and its Impact 9.30am – 11.30am NTU Campus Tour (For Parents and Guardians)	9.30am – 12.30pm Lecture: Data-Analytic Thinking	9.30am – 12.30pm Lecture: AI Applications in Different Fields	9.30am – 9.50am College of Engineering Talk by Assistant Dean, Prof Daniel New 9.50am – 10.30am Visit the School of Electrical and Electronic Engineering, Xperience@EEE 10.40am – 11.10pm Visit the School of Mechanical and Aerospace Engineering, Robotic Research Centre (RRC)
12.30pm – 2pm Welcome Buffet Lunch	12.30pm – 2pm Lunch break at NTU campus	12.30pm – 1.30pm Lunch break at NTU campus	11.10pm – 12.30pm Lunch break at NTU campus
2pm – 2.30pm Sharing by NTU students on Life in NTU 2.30pm – 3.15pm Ice-Breaking Games by NTU students 3.15pm – 5pm NTU Campus Tour	2pm – 5pm Lecture: AI Technologies 5pm – 6pm Dinner break at NTU campus 6pm Bus pick-up from NTU 7pm – 9pm Free & Easy Visit to Merlion Park, Singapore River and Esplanade	1.30pm – 3pm Self-Study and Preparation for Group Presentation 3pm Bus pick-up from NTU 3.45pm – 5.30pm Industrial Learning Journey 5.30pm Bus drop-off at an MRT station in the city area	12.30pm – 3.30pm Group Presentation by students Closing Ceremony, Certificate Presentation & Group Photo-taking 3.45pm – 4.45pm Admission Talk by NTU Office of Admissions (Parents and Guardians are welcome to join)

*Programme schedule may subject to change

Who Should Attend?

High school students aged 16 and above, with a good command of English and an interest in artificial intelligence, innovation, and technology. Ideal for curious learners eager to explore how AI connects to real-world challenges and future opportunities. To be eligible, applicants must be born on or before 31 December 2009.

Venue & Dates

Venue: Nanyang Technological University, Singapore. 50 Nanyang Avenue, Singapore 639798

Note: NTU reserves the right to change the date, venue, programme schedule and mode of delivery due to unforeseen circumstances.

Programme	Dates
The Power and Possibilities of AI	Programme Dates: 16 – 19 December 2025 Registration Closing Date: 4 November 2025

Programme Fee

Registration Type	Registration Deadline	Payment Deadline	Programme Fee per student (inclusive of 9% GST)
Early Bird Registration	14 October 2025	20 October 2025	SGD 2,398.00
Group Registration (At least 3 students registering together at the same time.)	4 November 2025	10 November 2025	SGD 2,398.00
Standard Registration	4 November 2025	10 November 2025	SGD 2,507.00

Remarks:

- Programme fee includes 9% Goods and Services Tax.
- This is a self-funded programme; thus, no funding or scholarship is available.
- Applicants will be notified latest by 6 November 2025 if the programme is confirmed to run.

What are included in the programme fee:

- 15 hours of tuition led by an NTU professor
- Welcome pack and NTU T-shirt
- Welcome buffet lunch
- Visit to NTU state-of-the art facilities
- Industrial visit
- Admissions talk by NTU Office of Admissions
- Campus tour and student sharing led by NTU student ambassadors
- Certificate of Completion (with minimum 75% attendance)
- Letter of Academic Performance (based on group presentation)
- Letter of Best Presenting Team (awarded to the winning team only)

What are NOT included in the programme fee:

Your accommodation, transportation, own leisure activities, airfares, visas, travel insurance, food and daily expenses are NOT included, unless otherwise stated.

Cancellation policy:

No refund will be issued once payment has been made to confirm your spot.

Payment mode:

Flywire (For more information: <https://www.ntu.edu.sg/life-at-ntu/student-life/onestop/payment-services/epayment-flywire>)

Payment Deadline:

To be completed by the respective payment deadline as indicated on the website.
(Payment instruction will be shared with you separately)

Certification

NTU Certificate of Completion will be awarded to participants who attain at least 75% of course attendance.



Instructor



Dr Kwoh Chee Keong, PBM

PhD, DIC, MSc(ISE), Beng(EE), PGDIG, Sr.MIES, M.ICAAS,
M.AMBIS

School of Computer Science and Engineering

Dr. Kwoh Chee Keong is currently in the School of Computer Science and Engineering since 1993. He had a joint appointment in the School of Chemical and Biomedical Engineering from 2004 to 2008. He was the Assistant Chair of Graduate Studies; School Appraisal Committee for Services. He was the Programme Director, MSc (Bioinformatics), the Deputy Director, Biomedical Engrg Research Centre, NTU, and Deputy Director, Biomedical & Pharmaceutical Engineering Cluster (BPE) Cluster and had a joint appointment in the School of Chemical and Biomedical Engineering. He has graduated 26 PhDs and 8 MEngs.

He has done significant research work in his research areas applying various Machine Learning and Data Analytics methodologies and published many quality international conferences and journal papers. He is on the Editorial Board Members and Associate Editor for of The International Journal of Data Mining and Bioinformatics; IEEE Access; TheScientificWorldJOURNAL; Network Modeling and Analysis in Health Informatics and Bioinformatics (NetMAHIB); Theoretical Biology Insights; and Bioinformation. He has been Guest Editor for many journals such as JMMB; International Journal on Biomedical and Pharmaceutical Engineering and others. He has been often invited as organising member or referee and reviewer for a number of premier conferences and journals, including GIW, IEEE BIBM, RECOMB, PRIB, BIBM, ICDM, and iCBBE just to name a few. He has provided many services to professional bodies and was conferred the Public Service Medal by the President of Singapore in 2008.

RESEARCH EXPERTISE

Dr. Kwoh main interests lie in looking for useful information from the big heterogeneous data by applying various AI, Machine Learning and Data Analytics methodologies for real application in engineering, life science, medical and manufacturing. These include: Data Analytics and Mining, Soft Computing, Artificial Intelligence, Machine Learning, and Statistical Inference, Learning with Unlabeled Data, Meta and Ensemble learning.

Frequently Asked Questions (FAQ)

1. **Do I need to bring my laptop to the programme?**
Yes, a laptop is required to participate fully in all lessons.
2. **Will the programme be delivered in English?**
Yes, all sessions will be delivered in English only.
3. **Is there an activity for parents to join?**
A complimentary, dedicated campus tour for parents will be held on the first day, providing an exclusive opportunity to explore NTU's vibrant campus. Parents and guardians are also welcome to attend the Admission Talk. The rest of the programme is designed for students only.
4. **Will accommodation be provided, or do I need to arrange my own?**
Accommodation is not provided as part of the programme. We encourage you to arrange your own stay according to your preferences and budget.
5. **Will meals be provided during the programme?**
A welcome lunch will be provided on 16 December 2025. For other meals, students can enjoy lunch and dinner at various food courts and eateries on the NTU campus at their own expense. You may explore the full list of available outlets here: <https://www.ntu.edu.sg/life-at-ntu/leisure-and-dining/general-directory>
6. **Are there food options available for special dietary needs?**
Yes, NTU offers a variety of dining options to cater to different dietary preferences, including vegetarian and halal meals. You may explore the full list of available outlets here: <https://www.ntu.edu.sg/life-at-ntu/leisure-and-dining/general-directory>
7. **What is not included in the programme?**
Your accommodation, transportation, own leisure activities, airfares, visas, travel insurance, food and daily expenses are NOT included, unless otherwise stated.
8. **What type of Visa should I apply?**
Please visit [Immigration & Checkpoints Authority \(ICA\) ICA | Entering Singapore](#) to check if you require a Visa to enter Singapore.
9. **Will there be funding or scholarship available?**
This is a self-funded programme; thus, no funding or scholarship is available.
10. **Who can I contact for more information after I have submitted my registration?**
Please contact our administrator via email: AskPACE.UIP@ntu.edu.sg
11. **Is my registration confirmed as enrolment upon signup?**
Please note that your registration is not confirmed upon signup. This is an open-enrolment programme which could only proceed to run based on sufficient intake. Applicants will be notified latest by 6 November 2025 if the programme is confirmed to run.
12. **Can I request an Invitation Letter?**
Yes, participants may request an e-copy of the Invitation Letter sent via email if he/she is successfully enrolled in this programme.
13. **Can I proceed to purchase air tickets after signup?**
Please DO NOT purchase air ticket upon signup. This is an open-enrolment programme which could only proceed to run based on sufficient intake. Applicants will be notified latest by 6 November 2025 if the programme is confirmed to run.
14. **What will happen if I need to cancel my enrollment?**
No refund will be made after you have made payment to confirm your spot.

15. How do I get to NTU?

Visit <https://www.ntu.edu.sg/about-us/visiting-ntu> for detailed directions and transportation options.

16. Can this program help with future university applications?

This programme provides you with an opportunity to find out more about NTU Admission requirements and to experience life in NTU. Admission to NTU undergraduate programmes will still be based on merits and entry requirements.