

Industry Engagement at NTU Singapore

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NTU Singapore – A Brief History

| 1991 | Establishment of NTU, with focus in Engineering & Business faculties |
|--------------|---|
| 2001 -2006 | New Disciplines Added Biological Sciences, Humanities & Social Sciences, Physical & Mathematical Sciences and Art, Design & Media |
| 2006 onwards | Heavy investments in Research & Recruitment |
| 2013 | Lee Kong Chian School of Medicine In collaboration with Imperial College London |
| 2018 | 24 on-campus halls of residence with Residential Education |



Colleges and Schools

College of Engineering

- Chemical & Biomedical Engineering
- Civil & Environmental Engineering
- Computer Science & Engineering
- Electrical & Electronic Engineering
- Materials Science& Engineering
- Mechanical& Aerospace Engineering

College of Science

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

College of Business

Nanyang Business School

College of Humanities, Arts & Social Sciences

- Art, Design and Media
- Wee Kim Wee Communication & Information
- Humanities
- Social Sciences

Lee Kong Chian School of Medicine

A collaboration with Imperial College London

Autonomous Institutes

- National Institute of Education
- S. Rajaratnam School of International Studies
- Earth Observatory of Singapore
- Singapore Centre on Environmental Life Sciences Engineering



Student Population (Nearest 100)

• 31,800 students

- -23,700 Undergraduates
- 4,500 MSc
- 2,900 PhDs
- 700 Postgraduate Dip. Ed



Staff Population (Nearest 100)

• 8,400 Staff

- 5,300 Faculty & Research
- 3,100 Admin & Technical
- ≈ 600 Engineering Faculty members
- 68% International



Research Grant

• USD ~428m research grants (FY17)



Five Peaks of Research Excellence

| SUSTAINABLE EARTH | GLOBAL ASIA | SECURE COMMUNITY | HEALTHY SOCIETY | FUTURE LEARNING | |
|---|---------------------------------------|--------------------------------------|--------------------------------|---------------------------------------|--|
| | | | | FR | |
| Conserving Transforming Recycling | Understanding Engagement Growth | Preventing Adapting Resilience | Healthy Living Active Aging | Understanding Learning Teaching | |
| Data Science | DATA is the new OIL | | A.I. is the new ENGINE | Artificial Itelligence | |

Building expertise in Data Science & AI to support Research Excellence



Pan University Institutes





Corporate Labs at NTU

The Next Orbit of R&D: Towards Knowledge Impact and Innovation Efficiency

Pull-through of research to applications

| ST Engineering | | | Singtel | SJ SURBANA | hp | FLURARIES | Rolls-Royce |
|---|---|---|--|--|---|--|--|
| | | | | Stall 1 | | | |
| \$52.5M | \$60M | \$45M | \$42.4M | \$60.9m | \$84m | \$120M | Phase 1:\$75M |
| Advanced Robotics & Autonomous System | Smart Urban Rail | Cyber- Physical Systems | Al & Data Science | Digitalization, Sustainability, Future of Industry | New Materials, Processes & Applications; Al and Cybersecurity for Digital Manufacturing | ReRam, Non-volatile Memory Tech Development & Manufacturing | Phase 2: \$87.5M Electrical Power & Control Systems, Manufact. Process Tech & |
| 30 Faculty 25 RFs 30 RAs 37 PhDs 10 MSc 21 UGs | 8 Faculty 36 RFs 21 RAs 50 SMRT Engineers 35 PhDs 107 UGs | 24 Faculty 32 RFs / RAs 30 Delta Engrs / Researchers 30 PhDs 5 MSc 60 UGs | 40 Faculty 20 RFs 20 RAs 15 Singtel Engineers 15 PhDs 50 UGs | 40 Faculty 25 SJ staff 70 RFs / RAs 15 PhDs 15 Masters 65 UGs | 15 Faculty 12 Postdocs 12 RAs 6 PhDs 80 UG | 6 Faculty 16 RFs / RAs 40 GFS researchers 8 PhDs 48 UG | IoT 50 Faculty 53 RR staff 23 RFs / RAs 47 PhDs 32 MSc 30 UGs |
| CorpLabs In the Pipeline | | Smart Mobility Est S\$50 M | | Artificial Intelligence Est S\$88 M | | Cybersecurity Est S\$22.5 M | |



Three Levels of Industry Engagement

- Collaborative Research
- Consultancy
- Student Projects



Dyson-NTU Studio

A Hotbed for Student Creativity and Innovation through Design-and-Build Projects

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As engineers, we have to see beyond existing technology and ask in there a better way?



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Background

- Dyson has its corporate headquarter in Singapore
- Has major manufacturing facilities in Singapore, Malaysia and the Philippines
- NTU is fertile recruiting ground



Dyson in the Philippines

https://careers.dyson.com/en-gb/where-we-are/asia-pacific/philippines/the-philippines/



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Vision and Objectives

- A Studio that is a hotbed for innovation and creativity in product design
- Infuse entrepreneurial spirit in students



NTU's Take

- Dyson is an iconic product design company
- Their products inspire our students
- Their engineers help to mentor our students



Dyson's View

- First on-campus engineering studio in Asia, started 2018
- Encourage student initiatives and projects
- Provide mentorship from Dyson engineers
- Help turn their ideas into viable solutions
- Support collaboration and build Dyson-NTU partnership
 - Iocal and overseas internships for students
 - > graduate recruitment
 - > complementing the way engineering is taught in NTU



The Studio









Facilities

- Computers
- 3D printers
- Light fabrication facilities, including
 - Desktop milling machine
 - Acrylic forming machine
 - Soldering station
 - Hand tools
- Measuring equipment



Projects

- Projects should be
 - Design and build
 - Multidisciplinary
 - Innovative
- Team members to be from different schools
- Project teams have both NTU professors and Dyson engineers as mentors
- May or may not be credit bearing
- Could be project under a course or students' own



Joint Dyson NTU Course: Product Development Challenge

- Project teams with students from different schools
- Conceptualise a product that solves a problem
- Design and build a prototype
- Dyson offers seminars on their methodologies
- Dyson engineers and NTU professors serve as mentors



Joint Design Competition





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Student Benefits

- Students work on projects outside the prescription of lectures and textbooks
- Find their own problems and solutions
- Enjoy academic and industry mentorship
- Have free access to the Studio 24/7
- Learn to be independent and resourceful
- Possible placement at Dyson



Thank You



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