

National Taiwan University 2021-2022 HANDBOOK

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Message from the President

With new challenges emerging every day in a rapidly changing world, universities must take on their responsibilities to society. In the past year, NTU has focused on turning crises into opportunities. We gained renewed energy from the challenges we faced. As we continue to dedicate ourselves to teaching and research, we have deepened our international connections and strengthened our support and care towards the university's faculty and students. When NTU takes on a bigger role in the community, our responsibility to serve society becomes greater.

First, NTU is committed to implementing the Sustainable Development Goals set up by the United Nations and focusing the efforts on economic advancement, social progression, and environmental protection. The ongoing planning of the "Sustainable Development Promotion Committee," which will be responsible for drafting NTU's sustainable development strategies and goals. In addition, the "Office of Sustainability" will integrate NTU's administrative and academic resources, and draft action plans that focus on making the NTU campus sustainable.

During the COVID-19 pandemic, NTU implemented various countermeasures that effectively protect our students and faculty on campus. The faculty and student body also leveraged their expertise in public health and medicine, and contribute to the national disease prevention efforts.

Second, NTU launched the "Future NTU" initiative, which aims to build an open university that centers around students' needs. The initiative includes "Specialization Programs", the "Transdisciplinary Bachelor Degree Program", "Individually Designed Majors", and "Exploratory Learning". These programs go beyond the typical framework of an educational system or academic program by facilitating learning modules that take students' individuality into consideration. Furthermore, NTU is committed to lowering the boundary between industries and academia through programs like the "Academy of Industry". In addition, NTU has launched programs available to alumni after their graduation to support lifelong learning, aiming to engage global trends in NTU's pursuit of education.

To foster cross-disciplinary discussions and collaborations, NTU set up the "NTU Core Consortiums Project," through which senior faculty members provide training for new and junior faculty members. The project has fostered studies and research that earned international recognition, including "the College of Public Health Contributes to COVID-19 Policy Decision Making", "NTU Researchers Develop Water-related Technologies, Demonstrating Their Concern for Society," the "Use of AI and Multiomics for Studying the Course of Disease and Drug Development," and the "Structural Biochemistry Analysis of Coronavirus nsp3 Macro Domains Leads to Novel Antiviral Development." In addition, an NTU health team has worked with local communities to prevent gastric cancer. The Department of Agronomy has also conducted a wide range of outstanding research, including showing how Ficus plants increase agricultural value, and contribute to the welfare of human beings and ensure environmental sustainability. NTU cares deeply about students' and faculty members' well-being. Starting in 2021, NTU launched the "NTU Faculty and Staff Holistic Care Service" program, which provides a wide range of mental health and well-being services for NTU's faculty and employees, including career consultation, well-being lectures and workshops. and additional activities. NTU also provides free health checks to faculty and employees. To meet the students' demand for mental health and well-being services. NTU has added more mental health professionals to its counseling center, established the Center for Student Well-Being, designated student guidance advisors, and encouraged academic departments to designate mentors and advisors for both local and international students. Through these services. NTU is committed to supporting students' mental health and well-being.

To expand international connections, NTU established the International College and planned cross-disciplinary international degree programs, taught entirely in English. These programs include Global Agriculture Technology and Genomic Science, Smart Medicine and Health Informatics, and Disaster Risk Reduction and Resilience. NTU also works with international partner schools on Chinese language and cultural education, and we hope to build a campus without national borders through international academic exchanges and joint research. At the same time, NTU is a global institution that offers opportunities for students to enhance their global mobility and cultivate talents that don't shy away from new challenges.

NTU is committed to educational reforms and innovation. As we prioritize our social responsibility, NTU will continue to be on the front line of Taiwan's development and progression.

President Chung-Ming Kuan

In duan



01

NTU MILESTONES

National Taiwan University's predecessor. Taihoku Imperial University (TIU), was founded during the Japanese colonial period in 1928. Following Taiwan's retrocession post World War II, the school was reestablished as National Taiwan University (NTU) in 1945. The university's roots, however, can be traced back to 1895, when the Japanese government established Taiwan Hospital, the precursor to NTU Hospital, in the Dadaocheng area of Taipei.



June 18: Taiwan Hospital opens in Dadaocheng, Taipei.

1928

March 17: TIU is founded. Originally the campus of the Taihoku Senior School of Agriculture and Forestry, it housed the Faculty of Literature & Politics, the Faculty of Science & Agriculture, the affiliated Technical College of Agriculture and Forestry (becoming the Taichung Senior School of Agriculture and Forestry in 1943), and a library. Dr. Taira Shidehara is appointed the first president of TIU.





1937 July

July

Forestland in Central Taiwan's mountainous region is acquired for highland farming experiments (with a highland experimental farm affiliated with the College of Agriculture opening in 1961).

1938

The university's affiliated hospital is established.

1941 July The Preparatory Division is established.

1943

March The Faculty of Science & Agriculture is divided into the Faculty of Science and the Faculty of Agriculture.

May The Faculty of Engineering is established.

1945

November 15: As per decree by the Executive Yuan. TIU is reestablished as National Taiwan University (NTU) with Tsung-Lo Lo as its first president. The university includes an affiliated hospital and a ranch, as well as six colleges: Liberal Arts, Science, Law, Medicine, Engineering, and Agriculture. Other administrative divisions are the offices of Academic Affairs. Disciplinary Affairs (renamed the Office of Student Affairs in 1994), and General Affairs.

0 1947

January

The Provincial College of Law and Commerce (originally Taihoku College of Commerce) is annexed, including the campus and buildings on Xuzhou Road.

1949

January Ssu-Nien Fu becomes the university's fourth president. (Fu Bell and Fu Garden are later built to commemorate him.)

May

The First Demonstration Forest Area is handed over to NTU by the provincial government and renamed the Experimental Forest under the College of Agriculture the following year.



1963

The Center of Electronic Computing (renamed the Computer and Information Networking Center in 1995) is established.

1982

November The university emblem is unveiled at the anniversary celebration.

1986

Noted NTU alumnus, Dr. Yuan-Tseh Lee, is awarded the Nobel Prize in Chemistry.

1987

August The College of Management is established.



1988

March The Student Representatives Federation is renamed the Student Association (with its president directly elected by the student body).

1993

May NTU becomes the first university in Taiwan to elect its own president. Mr. Wei-Jao Chen is nominated and takes office in June as the school's ninth president.

August The College of Public Health is established.

1996 October

The University Press is established.

1997 March

NTU celebrates its first Azalea Festival.

August

The College of Electrical Engineering (renamed the College of Electrical Engineering and Computer Science in 2000) is established.

1999

August The new College of Law is established. The former College of Law is renamed the College of Social Sciences.

2000

May The Zhubei Campus is established.

June

The Shuiyuan Campus opens after the National Defense Medical Center relocates and returns the land to NTU.

October

The Yunlin Campus Preparatory Committee is established.

2002

August

The College of Agriculture is renamed the College of Bioresources and Agriculture.



0 2003

August

The College of Life Science is established.

2007

August

The offices of Research and Development, International Affairs, and Financial Affairs are established.

November

The NTU Museums Group is launched.

2013

August

The School of Pharmacy is established.

2016

March

The Ministry of Education approves the establishment of the NTU System, which comprises NTU, National Taiwan Normal University (NTNU), and National Taiwan University of Science and Technology (NTUST).

2017

August

The Center for Continuing Education is renamed the School of Professional Education and Continuing Studies (SPECS).

November

NTU celebrates its 90th anniversary.

December

NTU Cancer Center, built with a donation by YongLin Healthcare Foundation, is inaugurated.

0 2019

January 8: Dr. Chung-Ming Kuan takes office as the 12^{th} president of NTU.



2020

June

The Social Responsibility and Sustainability Report is published, which documents the actions of this university in the areas of campus governance, teaching, research, and social services.

2021

June

Due to the COVID-19 pandemic, NTU conducts its first university affairs meeting and commencement online.



Global NTU

- $4,187^4$ international students from 82 countries
- 633 partner universities
- 671 student exchange programs in 49 countries

Social Responsibility

Every year NTU forms over 50 social service teams with 1,300 students participating, serving more than 4,000 people, and accruing over 76,000 service hours.

Worry-Free Learning

NTU, through its own funds and fundraising efforts, has collected more than NT380 million⁵ for scholarships which have benefitted more than 15,000 students.

The Hope Scholarship grants NT100,000 to low income freshmen and NT60,000 to mid-to-low income freshmen and other disadvantaged students in special circumstances. Starting from their 2nd year of study, students who meet certain conditions may continue to receive this scholarship until graduation.

Hope Stipends reward low income, mid-to-low income and other disadvantaged students in special circumstances with NT\$40,000 every academic year. Students from families with a household income that does not surpass NT\$800,000 per year can qualify for a stipend of NT\$80,000 per academic year.

Library Collection

The NTU Library collection includes over 4 million physical books, 3 million e-books, and 130,000 periodicals⁶, as well as access to more than 600 databases.

NTU Library launched the nation's first automated storage and retrieval system in October 2018. This system provides a high-density storage space sufficient to hold at least 1.2 million volumes. System users can obtain their desired volume within 2 minutes.

Note: 4. Including overseas Chinese students, students from China, international degree students, dual degree students, exchange/visiting/short-term students, and Chinese language students.

^{5.} Excluding financial aid, government scholarships and grants, and emergency assistance funds.

^{6.} Including digital periodicals and open access digital periodicals.

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Campus Learning

Expanding the Hope Admission Scheme

In the 2019 academic year, as part of its social commitment, NTU planned to double the number of disadvantaged student admissions within two years and triple it within four years. Disadvantaged students include those from low- or mid-to-low-income families or families facing special hardships, children of new immigrants, and those from rural areas. In the 2022 academic year, NTU admitted 50 students through the Hope Admission Scheme and 55 students who applied through the individual application recruitment channel in the "hope category", bringing the total number to 105. Hope admissions are not based solely on academic performance. Rather, students demonstrating a strong level of responsibility, compassion, positivity, diligence, and/or other forms of excellence in the face of adversity are favorably considered. NTU provides additional assistance to these students to enable them to successfully complete their degrees and to potentially revisit and revitalize their communities.

Training High-Level Talent

Strengthening Research of Students in Accelerated Doctoral Program

NTU's Accelerated Doctoral Program supports students enrolling in one of NTU's PhD programs directly after an undergraduate or graduate degree in the NTU System with a monthly stipend of NT\$24,000 for three years. This program has rapidly increased to more than 150 participants since the 2019 academic year.

Outstanding Doctoral Student Scholarships

Jointly offered by NTU and the Ministry of Science and Technology, these scholarships were awarded to 53 students in the 2019 academic year, 58 students in the 2020 academic year, and 57 students in the 2021 academic year. They include a monthly stipend of NT\$40,000 for four years. PhD students across all fields at NTU are all eligible regardless of nationality.

Number of Students in Accelerated Doctoral Program, 2013-2020



Xin Miao Key Technology Doctoral Scholarships

Funded by the Xin Miao Education Foundation, NTU began awarding Key Technology Doctoral Scholarships to domestic students in the 2019 academic year. Students in the following six disciplines are eligible: electrical engineering, information engineering, communications engineering, artificial intelligence, biomedical engineering, and sustainable development. Each awardee receives a monthly grant of NT\$30,000 for three years.

Specialization Program: Purposeful and Unique Exploration

The Specialization Program is a key part of NTU's recent curriculum reforms. 167 specialization programs have been offered by 39 academic units since the first semester of the 2021 academic year, representing core competencies across disciplines, emerging fields of study, and cross-disciplinary trends. Each program consists of four to five courses, amounting to 12 to 15 credits.

Restructuring courses into modules, each specialization program has a clear theme, such as the Internet of Things (IoT), Cybersecurity, and Artificial Intelligence. Individual courses are connected via these modules to guide students in purposeful exploration and to encourage interdisciplinary learning. This, in turn, provides them with a solid foundation for career development or advanced research. To each student upon graduation, an official certificate is awarded to document the successful completion of a specialization program.

What is the Specialization Program?





Specialization Program Compass



Quick Guide to the Specialization Program



Specialization Program FAQ

Combining Teaching and Research



To cultivate future research talent, NTU encourages students to engage in research at an early stage.

Undergraduate Honors Programs Train Innovative Research Talent

To encourage undergraduate students with research potentials, NTU passed the Review Guidelines for the Undergraduate Student Thesis Award on January 8, 2016. From 12 recipients in the first year (2017) to 31 in the fourth year (2020), more and more students have aspired to join these programs. Originally, a total of 27 departments offered specialized courses for upperclassmen, including seminars, special topics research, and thesis writing. To extend its research capacity. NTU passed the Implementation Guidelines for Undergraduate Honors Programs on June 12, 2020. With these new guidelines, undergraduates interested in research are encouraged, from their second year onwards, to tackle specialized courses to build their knowledge base and participate in research, to improve their research capabilities and to determine their research specialties and directions. Upon completion of relevant courses and a thesis approved by the department and the Office of Academic Affairs, students earn the right to add "Undergraduate Honors Program" on their diplomas, transcripts, and other related certificates. Currently, eight departments have established Undergraduate Honors Programs: Department of Clinical Laboratory Sciences and Medical Biotechnology, Department of Economics, Department of Sociology, Department of Finance, Department of Business Administration, Department of Medicine, Department of Geography, and Department of Public Health.

NTU COOL Supports Remote Learning During the Pandemic, Sparking Blended Learning Opportunities

As the digital age gradually provides more diverse modes of teaching and learning, NTU is implementing the next generation digital teaching platform, NTU COOL (NTU COurses OnLine), to lower the barriers for faculty members to incorporate digital teaching through blended learning and online classes, and thus open up new avenues for education and learning. NTU COOL was developed with the popular learning management system Canvas LMS. According to internal teaching needs, NTU COOL features personalized digital teaching modules via asynchronous video lessons, synchronous online interaction, and continuous documentations of learning progress and evaluation. In 2020-21, during the COVID-19 pandemic, NTU COOL provided teachers a viable platform for online video teaching, discussions, and even end-ofterm online evaluations to ameliorate the growing need to switch from in-person to remote learning. For the second semesters of the 2019 and 2020 academic years, teachers used NTU COOL in over 2,000 courses, more than 60% of which incorporated video teaching. The pandemic has afforded an unprecedented opportunity for instructors to experiment with hybrid digital and in-person learning models at the level of higher education.





NTU Establishes the International College

Official Launch of the International College

To cultivate global talent that is internationally mobile, NTU established the International College in August 2021. This marked a major milestone in NTU's efforts to promote globalized education. The objective is to build an interdisciplinary higher education platform that incorporates Taiwan's characteristics and academic strengths. As such, the International College aims to train global talents by transforming NTU into an omni-campus for all culture, creeds, and countries.

Development Strategy of the International College

There are three main development strategies of the International College. The first is to establish interdisciplinary international degree programs taught entirely in English. These programs focus on addressing current global topics, establishing internships at international organizations, and cultivating professionals with global mobility. The second strategy is to expand Chinese language and culture educational partnerships with schools overseas; and the third strategy is to build a campus without borders, including the use of academic exchanges to strengthen NTU's international ties.

Planning Direction of the International College

Overall Development and Planning of the International College: In the short term (2021-2023), the college aims to offer five international Master's degree programs. In the mid term (2024-2026), the college seeks to offer PhD programs in conjunction with overseas universities. In the long term, from 2027-2029, the college plans to introduce undergraduate degree programs. During each stage of development, the college will expand Chinese language education with international partner institutes while promoting the concept of a campus without borders. As NTU is transformed into a global hub for Chinese language education, a more omni-national and omni-cultural environment will naturally be formed as top students from around the world congregate. Interacting with people from other cultures offers Taiwanese students the chance to develop a more global perspective. These plans will also bring new value to the International College. Moreover, creating innovative international links will diversify NTU's learning environment and accelerate its push toward internationalization.

Campus Learning

ELECTROCHEM

Social Responsibility and Service

NTU students show their care and compassion for Taiwan and its people through commendable undertakings that are often linked to their areas of study. They even travel to rural areas of Taiwan and abroad to implement service projects. Every year, NTU offers over 700 service-learning courses and organizes more than 50 social service teams, working in indigenous communities in mountainous areas of eastern Taiwan, fishing villages on outlying islands, and other countries, such as India, Malaysia, and northern Thailand. Participants organize recreational camps and



northern Thailand. Participants organize recreational camps and service learning and teaching assistant training assistant training

environmental protection initiatives. To encourage students to serve in domestic and overseas rural communities, NTU subsidizes professional service programs in rural areas and supports long-term comprehensive projects in designated locations.

The Social Devotion Award and Student Altruism Award are given to students who enthusiastically fulfill their social responsibilities and tirelessly devote themselves to improving the lives of the disadvantaged. Recipients of the 2020 Social Devotion Award are:

• WANG, WEN-YI (Second Degree Bachelor of Science in Nursing):

Wang established a hospice care service team to promote a diversified future for hospice care. Through holistic concern for body, mind, and spirit and educational activities, we are hoping to inspire the general public, especially the youth, to appreciate and respect life.



Service learning and social service teams present their achievements



Social service team – Students from the Department of Library and Information Science provide science lessons on Lanyu (Orchid Island)





Prevention Crossing:

As COVID-19 has continued to ravage the globe in 2020, this corps dedicated its expertise by developing a smart digital access control and tracking system with forehead temperature checks and entrance restrictions to safeguard the lives of more than 70,000 people on campus.

Global Health and Service-Learning Club:

This health care service team is dedicated to serving disadvantaged groups in Ladakh, India. From a local perspective, the club aims to develop a model of empowerment, helping communities to become self-reliant and bringing about long-term and lasting changes in the region.

Dream Field Comprehensive Support Program

NTU launched the Dream Field Comprehensive Support Program for economically or culturally disadvantaged students. A one-stop online application is provided for guidance on more than 30 items across six major areas: empowerment, financial support, academics, international exchanges, career development, and cultural and social services. The goal is to help multi-talented students cultivate strong leadership skills, employment competitiveness, and physical, mental, and cultural competencies.

From 2018 to 2021, 12,960 scholarships and stipends had a total value that surpassed NT\$57.55 million and benefitted 2,854 students.

At the 2020 NTU anniversary celebration, the NTU president presents a social devotion award to the epidemic Prevention Crossing.



A ceremony to mark completion of an elementary school camp



Global health and service learning club





Opening ceremony for the Global Initiatives Symposium in Taiwan



GOLF NTU information meeting





Global Talent Development Camp

Cultivating Diverse Competencies and International Perspectives

Global Initiatives Symposium in Taiwan

To equip students with required workplace skills and increase their competitiveness, NTU has devised a learning framework for career development. In addition to offering Career Aptitude Assessment and Consultation, this framework includes diverse competency development courses and programs for cultivating cross-disciplinary and international talents, such as the globalized talent Development Camp, Introduction to Business Administration Lectures, and Gap of Learning & Field (GOLF) NTU information meeting. The National Taiwan University Internship Program (NTUIP) was launched to encourage student participation in internships by providing project-based or overseas internship opportunities that bridge the gap between academia and industry and provide students with workplace knowledge and skills. In 2020, this program provided 3,426 internships.

NTU founded the Global Initiatives Symposium in Taiwan (GIS Taiwan), which has become Taiwan's largest international student learning forum. This five-day symposium gathers scholars and entrepreneurs from various fields and student delegates from around the world. It is a cross-border, cross-disciplinary, cross-generational government, academia, and industry exchange platform for leaders and students. The goal is for young scholars to join in-depth discussions on important global issues and propose action plans in order to connect with the world.

NTU D-School

NTU established D-School in March 2015 to provide innovative education that promotes creativity in a student-centered interdisciplinary teaching and research environment. Following six years of development, in August 2021, D-School officially became a functional academy for both pedagogy and research. With its core dedications to innovation, entrepreneurship, placemaking, and the future, D-School serves as an experimental sandbox for innovative education across NTU. Moreover, D-School joins with other departments in developing innovative classes and projects that respond to global changes and trends, with the aim of cultivating innovative, potential talent.

Innovation: Issue-Based Practical Education Centered on Design Thinking

Innovation

with teachers and instructors across disciplines both inside and outside the university to develop core competency courses that extend from designoriented and issue-based courses. New courses from D-School include: "The Elementary Forms of the Social Design"

New courses from D-School include: "The Elementary Forms of the Social Design" invites students to physically experience sociology, using their feet to traverse the paths of social change and their hands to trace the networks of social intricacies. "Food Design and Social Innovation" leads students to consider the design image of beer from the perspective of indirect influences, such as localities, interactions, and the future. "Designing Experiences Within Living Landscapes" uses object design as a basis for understanding and designing somatosensory life experiences. "Changing Museum Practice of living culture" explores the creative practices of museums from a meta-museum perspective to understand how they shape local communities. "Forest School" collaborates, through theatrical methods, with key figures in Nanao to design a practical theatrical model for local communities.



of

D-School's innovative classes focus on teaching students how to learn. In addition to providing core design-oriented classes, D-School cooperates with teachers and instructors across disciplines both inside and outside the university to develop core competency courses that extend from design-



Entrepreneurship: Industry Practice + Teaching Teams for Guidance and Incubation

ntrepreneurialism

To develop students' entrepreneurial spirit and leadership capabilities, D-School integrates two credit-based course programs. In the Creativity and Entrepreneurship Program, Entrepreneurship is the incentive for students to engage in interdisciplinary studies and immerse in practical applications. As students create, they learn not to fear failure. In the leadership program, while exploring the future, students become better leaders who cooperate well with their peers. Through teamwork, they serve society,



gain practical experience, and have a positive social impact. In both programs, industry practices are applied and teachers with real-world experience guide and incubate student teams. Providing the students with industry experience narrows the gap between planning and implementation while offering an opportunity for them to reflect on iterative schemes and strategies.

Placemaking: Experiential Courses × Field Study × Innovative Communities

To develop innovative communities, in addition to establishing a community presence, the most efficient method is for NTU to become a platform to locate required resources and to enable functional collaborations. Such a platform promotes the flexible assembly of cooperating teams of actants. During the collaboration of solving communal issues, participants are able to freely contribute ideas, course knowledge, and practical experiences.

D-School relies on a unique mechanism for cultivating a field network, in which the university serves as an organizational node. By connecting actors and actants such as communities, businesses, government agencies, and nonprofit organizations, this mechanism promotes urban action and community engagement. It provides tools, operational support, and facilities that break free from the traditional linear model of social ties to forge a shared social practice platform that is fair, just, and prosperous. Moreover, this platform supports the building of a diverse and densely woven social network.

Taking place both on and off campus, a recent project aims at establishing a Tamsui-Kavalan mobile learning route between NTU, Pinglin and Yilan. New Taipei's Pingxi and Yilan's Shengou and Nanao become locales for practical field-based cooperation, by combining museums, regional high schools and vocational schools, and local organizations. By applying experiential courses, off-campus study, and community exchange activities, this project brings together key actors and actants valuing quality education with an organic networking platform of mutual learning and collaboration.





Other Interesting Courses

Future NTU: Building a "Learner-centered Open University"

Since February 2019, D-School has conducted interviews, workshops, and forums to gather suggestions for building the Future NTU. Our proposal begins with an open university centered on learners. We believe that the Future NTU should break down existing systems to foster a more flexible and open university, while leveraging teaching and learning to develop an organizational culture and network centered on learners. Six main strategies and four core beliefs support numerous action plans.

In 2021, D-School implemented the following action plans: Exploratory Learning, Trans-disciplinary Bachelor Degree Program, Specialization Programs, Accompanied and Guided Teaching (NTU Academic Advising Office / Student-Centered Consultation), Designing Your Own Course, and Education Sandbox. Preparations and planning are underway for the Alumni Warranty plan and Academy of Industry.

> 02 把年大學生的片質和何錄聲?

社會新鮮人的能力是否和責持的關鍵才保房? 與學生或社會新鮮人的互動之中讓觀察到甚麼使得行意的現象?





Future NTU White Paper







54.349

2020 Year

2016

Total Academic Articles Published by NTU Researchers and Citation Rates, 2010-2020



From January 2010 to December 2020, last update on March 25, 2021.

Highly Cited Papers Published by NTU Researchers



From January 2010 to December 2020, last update on March 25, 2021.

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NTU Core Consortiums Project

The purpose of this project is to encourage senior faculty members to mentor younger faculty members, to facilitate advances in research and foster an exceptional generation of researchers. Based on the spirit of a seed program, external resources are acquired and studies on critical issues are formulated. Development of novel research topics will enable NTU to continue its outstanding research tradition.

In 2021, we encouraged cooperation between instructors and medical doctors, with a focus on clinical research. Interaction and engagement between different groups of researchers promotes interdisciplinary collaboration. There has been a particularly enthusiastic response to the application of the collaborative model to clinical studies.







J Med Internet Res. 2020 Sep 17;22(9):e22469. DOI: 10.2196/22469.



Professor Tony Hsiu-Hsi Chen's slides for his podcast *Science and COVID-19* on July 21, 2021 (traditional Chinese only) The College of Public Health Contributes to COVID-19 Policy Decision Making

NTU's Population Health Research Center is the only institute in Asia accredited by the US Council on Education for Public Health (CEPH). This center includes faculty from the College of Public Health who organize public health teams comprised of members from different fields with the goal of building a big data center focused on health-related topics. During the past three years, the College of Public Health was awarded three SPROUT projects and one Core Consortiums project.

NTU researchers have created an index for lifting social distancing during the COVID-19 pandemic, based on case rate, fatality rate, and recovery rate. Health decision makers in affected countries, cities, or regions can consider lifting social distancing restrictions if the index score is less than one. These findings were published in the Journal of Medical Internet Research: *J Med Internet Res.* 2020 Sep 17;22(9):e22469. DOI: 10.2196/22469.





Bioacoustics Investigation – Analyzing the Effects of Climate Change on Fish Chorusing Patterns

The Research Center for Future Earth (RCFE) was established with the Global Change Research Center as its foundation. RCFE brings together outstanding scholars and research capacities in the fields of earth sciences, environmental engineering, ecological resources, the humanities, and the social sciences as it seeks to implement four interdisciplinary and forward-looking research projects. The aim is to investigate climate and ecological changes in Taiwan and neighboring areas (West Pacific and Southeast Asia) and the driving forces behind them, as well as resource competition and integration, ecological interactions, and the impacts on humanity, society, and economic development under different temporal and spatial contexts. RCFE actively researches and develops adaptable technologies to provide sustainable answers to questions and recommendations for issues related to science. NTU has consistently been in the top 50 of QS World University Rankings in the science and engineering fields over the past three years. Recently, NTU has provided grants to two Core Consortiums projects related to environmental protection, energy savings, and sustainability.

Chi-Fang Chen, of the Department of Engineering Science and Ocean Engineering, and Indian postdoc Shashidhar Siddgangaiah researched long-term fish chorusing patterns in the eastern part of the Taiwan Strait. They showed that typhoons and flooding result in the ceasing of fish chorusing behavior.

Construction of offshore wind farms is part of the Taiwan government's initiative to shift towards greener energy. However, this contributes to anthropogenic factors that may impact marine species. To monitor adverse effects on marine species, Professor Chen and his team deployed passive acoustic devices around wind farms in coastal areas of Miaoli and Changhua. The chorusing patterns explored in the long-term study provide important baseline data to understand the impact of anthropogenic factors, climate change, and climate-driven extreme/ episodic events on fish phenology. This work also provides evidence that changes in ambient conditions can significantly alter the phenology of vocalizing marine species.





Nature Climate Change, 11, page 292 (2021). https://doi.org/10.1038/s41558-021-01025-6



Ecological Indicators, 125, June 2021, 107456. https://doi.org/10.1016/ j.ecolind.2021.107456

QS World University Rankings by Subject

	2021	2020	2019
Engineering & Technology	40	42	29
Natural Sciences	62	51	29
Chemistry	54	51- 100	48
Geography	51- 100	51- 100	48

Their Concern for Society

Omniphobic membranes and application thereof, by KL Tung, A Huang, LH Chen, YR Chen, CH Chen, CC Hsu, FY Tsai, US Patent 10 940 438

Hybrid capacitive electrodialysis deionization device and hybrid capacitive electrodialysis deionization method thereof. by TH Chen, CH Hou, DM Wang, SW Tsai, YA Chen. TW Patent 1727.365.

QS World University Rankings by Subject 2021 2020 2019 Engineering 40 42 29 & Technology

In the QS World University Rankings, NTU has placed in the top 50 in engineering & technology fields over the past three years. The Advanced Research Center for Green Materials Science and Technology has gained support from the Ministry of Education's Higher Education SPROUT Project, enabling it to develop internationally competitive core technologies in three fields: circular and renewable materials, energy materials, and green manufacturing processes. In recent years, NTU has provided grants to two Core Consortiums projects related to environmental protection, energy savings, and sustainability.

NTU Researchers Develop Water-related Technologies, Demonstrating

In 2021, Taiwan faced its most severe drought in half a century, exposing many problems with the country's water usage practices. Shang-Lien Lo, the head of the Water Innovation. Low Carbon and Environmental Sustainability Research Center, under the College of Engineering, has led a group of three professors, Gene Jiing-Yun You, Kuo-Lun Tung, and Chia-Hung Hou, to analyze the current status of the nation's water resources and propose policy recommendations.

Professor Kuo-Lun Tung, of the Department of Chemical Engineering, developed a membrane distillation technique which uses biomimetic omniphobic membranes in the development of membrane contactors. This technology can be used to filter industrial wastewater to produce reclaimed water.

Professor Chia-Hung Hou, of the Graduate Institute of Environmental Engineering, adopted energy storage device concepts and capacitive deionization technology to reduce the amount of electricity factories need for water reclamation by as much as 50%.

NTU professors developed both of these patented technologies, demonstrating the benefits of academic-industrial cooperation, while advancing Taiwan's water-related technology and helping to reduce domestic water shortages.

Use of AI and Multiomics for Studying the Course of Disease and Drug Development

NTU has placed among the top 50 universities on QS World University Rankings in engineering & technology and medicine over the past three years. Moreover, it has seen vigorous development in computer science and information engineering, particularly in the field of AI, and has achieved many medical breakthroughs. Over the past three years, NTU has provided grants for two SPROUT projects and three Core Consortiums projects that involve applications of AI to biomedical research.

To counter COVID-19, a team led by Distinguished Professor Hsueh-Fen Juan of the Department of Life Science used big data to search for new therapeutic methods based on existing medicines. Professor Sui-Yuan Chang of the Department of Clinical Laboratory Sciences and Medical Biotechnology then performed cellular experiments to test the effectiveness of candidate medicines. Results were published in Heliyon, a new Cell Press journal. Plans are underway for animal testing and technology transfer.

Professors Juan and Chien-Yu Chen of the Department of Biomechatronics Engineering jointly advised a Taiwanese team working on AI, bioinformatics, and algorithms that built a DockCoV2 database for predicting the binding affinities of FDA and NHI-approved drugs with various proteins. This database provides the latest prediction results and users can download drugprotein docking data and examine additional drug-related information. This team announced its results in *Nucleic Acids Research*, listed as the top publication in the biochemistry category of Google Scholar.







Helivon, 6(12), December 2020, e05646. j.heliyon.2020.e05646



Nucleic Acids Research, 49(D1), 8 January 2021, D1152-D1159, https://doi.org/10.1093/nar/ gkaa861



QS World University				
Rankings by Subject				
	2021	2020	2019	
Anatomy & Physiology	51-100	51-100	33	
Medicine	49	51-100	50	
Nursing	51-100	39	29	



Cell Rep. 2020 Oct 13;33(2):108254. DOI: 10.1016/ j.celrep.2020.108254. https://doi.org/10.1016/ j.celrep.2020.108254



EMBO Mol Med (2021)13:e12828 https://doi.org/10.15252/ emmm.202012828

Genome Research and Small Molecule Drugs Provide a Solution for Disease Resistance

NTU's medical-related departments are world-renowned. NTU has ranked among the top 50 universities in the fields of medicine, anatomy & physiology, and nursing over the past three years. Recently, its Centers of Genomic and Precision Medicine have been promoting genomic studies and interdisciplinary translational research. Research is focused on cancer and infectious diseases, with the aim of proposing new treatments and preventive techniques and strategies. These centers use multiomics, together with data and structural biology techniques, to assemble a comprehensive collaborative platform that features several omics approaches. These facilitate a deeper understanding of unmet medical needs relating to infectious diseases, stress, and cancer. These centers aim to provide more effective therapeutic methods, drugs, or courses of treatment that consider different disease factors based on individual patients' genetics, constitution, or ethnicity. In recent years, NTU's genome-related research has received eight Core Consortiums grants.

The COVID-19 pandemic, caused by the coronavirus SARS-CoV-2, has posed a serious threat to public health, making the development of more effective antivirals an imperative. Focusing on the critical step when the virus enters the host cell, a team of researchers led by Professor Shiou-hwei Yeh of the Graduate Institute of Medical Microbiology. College of Medicine, and Professor Sui-yuan Chang of the Department of Clinical Laboratory Sciences and Medical Biotechnology found two furin inhibitors: decanoyl-RVKR-chloromethylketone (CMK) and naphthofluorescein. These inhibitors can block virus entry and suppress viral RNA transcription, thus stopping replication of the coronavirus in the host cell and preventing the emergence of cytopathic effects. These insights laid the groundwork for further development of antiviral agents against COVID-19. The team's finding were published in the October 2020 issue of Cell Reports. In addition, NTU College of Medicine professors Pan-Chyr Yang and Sui-Yuan Chang cooperated with the Institute of Biomedical Sciences in developing a humanized decoy antibody ACE2-Fc. The front of ACE2-Fc is the extracellular region ACE2 receptor, and the back is the Fc region of human IgG. After the ACE2 section of the decoy antibody binds with the virus, the Fc section of the decoy activates NK cell activity. Efficient viral inhibition was observed in multiple clinical strains. The research was published in the November 2020 issue of EMBO Molecular Medicine. Both of these research projects received US provisional patents.





Structural Biochemistry Analysis of Coronavirus nsp3 Macro Domains Leads to Novel Antiviral Development

A team of researchers specializing in agricultural chemistry, biochemistry, and systems biology, and led by Professor Chun-Hua Hsu, has long used structural biochemistry and biophysics to research macro domain functions. During the COVID-19 pandemic, this team quickly sought to analyze the three-dimensional structure of the SARS-CoV-2 macro domain with ADP-ribose protein. Their research was published in November 2020 in *ACS Infectious Diseases*, a journal of the American Chemical Society (ACS). The team used nuclear magnetic resonance to research the effects of temperature on protein structure and kinetics. Based on molecular simulations and biochemical evidence, the team elucidated the tunability of the binding behavior of the MERS-CoV macro domain. They also showed that MERS-CoV binds with NAD metabolites at physiological temperature in humans. This points to the possibilities for metabolic molecules in the interactions between pathogen macro domains and host cells. Future drug designers may be able to use these findings to understand the protein tunability of binding sites. Research results were published in January 2021 in *Communications Biology*, part of the Nature Portfolio.











ACS Infect. Dis. 2020, 6, 11, 2970-2978 https://doi.org/10.1021/ acsinfecdis.0c00441



Communications Biology, (2021) 4:123 https://doi.org/10.1038/s42003-020-01633-6





Connections

Global

Increasing the Quality of International Collaborations

Launching the Strategic Partnership Project

Having formed ties with 636 renowned universities abroad, NTU is now focusing its internationalization efforts on enhancing the guality of these relationships. The aim of the Strategic Partnership Project is to strengthen ties with key partners, including the University of Illinois at Urbana-Champaign, the University of Sydney, the University of Tokyo, and Kyoto University. By holding bilateral matchmaking events and providing initial cooperation funds. NTU deepens and broadens our relations with international partners. Furthermore, NTU promotes international cooperation seed programs, provides subsidies for international exchanges and collaborations, and establishes interdisciplinary research teams to encourage extended exchanges for both teachers and students to address current social issues. During the pandemic, NTU still upholds its dedication to international collaboration by initiating academic exchanges via a web-based signing ceremony with Northwestern University.

Joining International Higher Education Organizations

In order to raise its international visibility and enhance its academic and social impact around the world, NTU is strengthening ties with international organizations such as APRU, AEARU, ASAIHL, and SATU. Moreover, it joins with partner universities to develop presentations for annual conferences of international higher education organizations such as APAIE, AIEA, and NAFSA. NTU is also collaborating with AEARU to launch online classrooms, which facilitate interactions among teachers and students of member universities. Within Taiwan, NTU holds the highest number of memberships in international higher education organizations. The creativity and flexibility displayed by NTU in its international exchanges caught the attention of Minerva University, an innovative and experimental campus-free university. It has collaborated with NTU to make Taipei one of only seven cities across the globe in which Minerva operates.



Virtual signing ceremony with Northwestern University to launch academic exchanges



Students share their overseas study experiences at the NTU Study Abroad Fair

Strengthening Students' International Mobility, Cultivating Global Talent

Diversifying Study Abroad Channels

Cultivating a global perspective for its students is critical to NTU. By offering nearly 675 exchange student programs in 49 countries. NTU sends around 1.300 students abroad for exchange or short-term study programs or internships every year. This means that nearly a third of the student body spends time overseas before graduation. These programs not only strengthen the effectiveness of student exchanges, but also serve as channels for professional training while improving foreign language proficiency. NTU cooperates with prestigious universities to offer around 90 dual-degree and triple-degree programs while developing diverse co-learning models such as GIP-TRIAD. Furthermore, overseas summer programs enable NTU students to study and conduct research during their summer vacations at esteemed universities such as Stanford University, University of Oxford, and Heidelberg University. Participants are able to complete comprehensive academic trainings while experiencing diverse cultures.

Encouraging Students to Pursue Their Dreams Abroad

To broaden students' international perspectives and experience, facilitate academic and cultural exchanges with higher education institutions across the globe, and cultivate internationally competitive talent, NTU hosts multiple dedicated projects and grants. The Sprout Project offers grants to exchange students from low-income households. In addition, the Y.L. Lin Hung Tai Education Foundation provides Yu Lin Scholarships to nurture international talent in Taiwan in five major fields: media literacy, knowledge society, aging society, regional positioning, and immigrants and migrant workers. Moreover, the National Taiwan University Voyage of Aspirations Scholarship was launched in 2019 to open more doors for disadvantaged students to join exchange programs. With such support, the financial burden of studying abroad is greatly mitigated, so that students can focus on developing their international competitiveness and freely explore potential opportunities on the international stage.

Building a Cosmopolitan Campus by Offering Diverse International Courses

Designing a Diverse Range of International Degree Programs

NTU provides courses taught entirely in English to nearly 1,000 international degree students. International degree programs, which focus on both professional knowledge and practice, are application-oriented, with an emphasis on internships and technical training. By actively cooperating with industries at home and abroad, internship opportunities are made available that connect learning and work. There are close to 90 degree programs available in English, including BA in civil engineering and agricultural economics, Global MBA, and MSc/PhD in Global Health. There are also two cross-collegiate, cross-disciplinary master's degree programs taught entirely in English: Global Agriculture Technology and Genomic Science (Global ATGS) with Biodiversity.

Building a Cosmopolitan Campus by Offering Diverse Courses and Activities

NTU provides more than 1,000 courses taught fully in English and additional courses taught in more than 10 different languages. With courses offered in multiple languages, students enjoy a wide range of options to sate their academic demands.

Since the second semester of the 2020 academic year, this university has invited 20 faculty members to join the 2nd Mentor Project to ease international students into life at NTU. Thus far, 50 international students has benefited from this project, and this number is expected to be drastically expanded in the near future. To provide Muslim students, teachers, and administrators with appropriate and convenient space for prayer, NTU installed two prayer rooms in the Liberal Education Classroom Building and one in the library in 2021. Such effort is a step towards promoting a congenial campus for all creeds and cultures.

During the Pandemic NTU Continues International Exchanges, Cooperation, and Courses

Bearing Responsibility for Global Issues

NTU provides subsidies to teachers and students to participate in international organizations and conferences, such as Global Health, Multi-hazards, and Sustainable Cities and Landscape, to promote cooperation in fields related to sustainability. Currently, NTU is collaborating with various teams to tackle urban problems defined by the UN in its Sustainable Development Goals (SDGs). Due to COVID, partner universities are developing new collaborative models with NTU to explore possible international academic exchanges in the current situation.

Maintaining International Cultural Exchanges During the Pandemic

NTU Plus Academy offers international short-term programs that integrate academic subjects with Taiwanese cultural experiences that enable students from around the world to acquire knowledge outside their primary program of study. Since 2020, in response to the COVID-19 pandemic, NTU has planned a variety of online courses. Through these courses, international students remotely engage in synchronous or asynchronous learning, so that their studies are unaffected by time or distance. NTU also recruits and trains students to serve as counselors for short-term international courses in order to promote interactions with and among international students suffering from travel restrictions.



Online Cultural Activities: Counselor and International Student Exchanges







The special exhibition website includes a panoramic view of the physical exhibition.



Special exhibition website



NTU campus architectural history website Over three years ago, on November 15, 2018, coinciding with the 90th anniversary of NTU, the Gallery of NTU History launched the special exhibition "Exceptional Commencement: The Early Years of National Taiwan University" in the Chuan Lyu Exhibition Hall. In the Chinese title of this exhibition, the character $\stackrel{\text{th}}{R}$ is an ancient form of another character, cui ($\stackrel{\text{th}}{P}$), meaning refined. It also incorporates the characters of nine ($\stackrel{\text{th}}{L}$) and ten ($\stackrel{\text{th}}{-}$), denoting the 90th anniversary of the founding of this university. NTU has already reached its 94th anniversary, but much of the history and many of the stories in this exhibition still resonate with us today.

The permanent exhibition hall of the Gallery of NTU History displayed the milestones of NTU dating back to its founding in 1928. This special anniversary exhibition further elucidated the institute's opaque history from the Japanese establishment of the most prestigious university in Taiwan to its reorganization as NTU during the early stages of Taiwan's retrocession.

The Taihoku Imperial University (TIU) section traced the root and history of the university's founding, exploring its preparation and establishment from both the Taiwanese and Japanese perspectives in the 1920s. Three key figures in TIU's establishment were introduced: Governor-General Takio Izawa, administrative officer Taira Shidehara, and education officer Kintaro Ooshima. The various resources, including finance, land, and labor, obtained to establish TIU, the development of TIU's academic system and the origin of its student body, and the key Taiwanese figure to TIU under Japanese rule were all featured in the current exhibition.

March 2018: Newly inaugurated NTU president Chung-Ming Kuan attended the NTU 90th anniversary special exhibition and took a group photo with university historians and colleagues from the Gallery of NTU History and NTU Archives.





NTU's first diploma (issued to Ding-Yue Liu, who became a professor in the Department of Mechanical Engineering). At the opening ceremony of the special exhibition on November 15, 2018, Ding's family members donated this diploma to the Gallery of NTU History.

The section on NTU's early history focused on the period after World War II when the Nationalist Government dispatched officials to take over TIU and reorganize it as NTU. This section narrated the takeover process under president Tsung-Lo Lo (the first president of NTU) and how the initial hardships, such as frequent changes in leadership, were overcome. The pivotal contributions of NTU's fourth President Ssu-Nien Fu, preemptory and preparatory measures during a drastic time of change, and herculean recruitment efforts following the mass repatriation of the entire Japanese faculty members and students were all presented in detail.

This special exhibition ended more than two years ago but can still be seen virtually. NTU also launched the first stage of a website on its architectural history, including developments and changes during the Qing dynasty, Japanese colonial period, and after World War II. During the COVID pandemic, all are welcome to virtually visit these exhibitions to gain a better understanding of the university's more than 90 year history.



A display showing diplomas from different periods of NTU's history, including the first diploma (center, donated by the family of Ding-Yue Liu, who became a professor in the NTU Department of Mechanical Engineering). On the special exhibition website click on "Diplomas" to view these historic documents and their introductions.

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National Taiwan University





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