2025

NYCU NATIONAL YANG MING CHIAO TUNG UNIVERSITY

SUSTAINABLE DEVELOPMENT GOALS

Sustainable Development Annual Report

國立陽明交通大學

NATIONAL YANG MING CHIAO TUNG UNIVERSITY

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SUSTAINABLE DEVELOPMENT GOALS

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Letter from President

In 2024—widely recognized as the hottest year since instrumental records began—the planet's average surface temperature exceeded the pre-industrial baseline (1850–1900) by more than 1.5°C for the first time, reaching the threshold set in the Paris Agreement (Note 1). Amid intensifying climate impacts and growing geopolitical complexity, universities must respond not only through education and research, but also by leading social transformation across three fronts: everyday practice, institutional design, and culture building.

Over the past year, we advanced campus sustainability around the pillars of "behavior change × campus governance × social engagement." We expanded Sustainability Week and Car-Free Campus Day, weaving energy saving and carbon reduction into daily commuting choices. We completed our first organization-wide greenhouse-gas inventory and secured third-party verification, establishing a scientific baseline for our 2050 net-zero pathway.

The Ministry of Environment's 2024 Green Talent Employment Trend Report (Note 2) indicated that more than 3,600 companies posted related openings over the year, averaging 22,000 vacancies per month, with demand approaching that for AI. To meet the industry's urgent demand for green talent, we are embedding sustainability literacy across all colleges. In parallel, the Community & Peer Education Center has launched a micro-credential in Net-Zero Emissions and a micro-credential in Sustainability Leadership. These programs strengthen student competencies in carbon accounting, circular economy, sustainability governance, and stakeholder engagement, helping young people connect future careers with everyday practice.

In terms of University Social Responsibility (USR), we have cultivated more than 20 USR, USR-Hub, and SDG action projects. Faculty and students brought expertise in medicine, engineering, information science, and the humanities and social sciences into local communities, transforming knowledge into public value.

At this decisive moment, National Yang Ming Chiao Tung University will answer the call of the times with steadfast execution and cross-sector collaboration: co-designing and implementing net-zero pathways with government agencies; co-creating low-carbon technologies and site-based solutions with industry; and sharing knowledge and cultivating talent with international academic partners. We invite all faculty, students, alumni, and social partners to stand with us so that every teaching, research, and administrative decision is a choice made responsibly for the planet and for future generations.

Thanks to the commitment of our colleagues and students, the university rose to 41st globally in the 2025 THE Impact Rankings, and received multiple domestic sustainability awards—evidence that our governance direction and the intensity of our actions are on the right track.

- Note 1. Paris Agreement goal: hold the increase in global average temperature well below 2°C above pre-industrial levels and pursue efforts to limit the increase to 1.5°C.
- Note 2. In December 2024, the Ministry of Environment released the Green Talent Employment Trend Report, drawing on research from the 104 Job Bank.

The President Chi-Hung Lin
National Yang Ming Chaio Tung University

About NYCU

Profile

Colleges and Organizations

19 Colleges + **1** Affiliated Hospital

22,117
Number of Students

1,150
Number of Full-time Faculty

1,083
Number of Full-time Staff

1,221
International Students

48
International Faculty Members

310+
Number of Sister Universities

10
National-level Research Centers

39
University-level Research Centers

37
College-level Research Centers

* Figures as of the end of June 2024.

Sustainability Impacts

THE Impact Rankings 2025

41 st

SDG 2 22 nd	SDG 3 20 th	SDG 7 27 th	SDG 9 41 th
SDG 11 39 th	SDG 12 65 th	SDG 16 10 th	SUSTAINABLE DEVELOPMENT GOALS

Recognitions & Honors

2023

- **Ministry of Environment, Green Dining & Waste-Reduction Action Competition —** Outstanding Award, Environmental Pioneer category.
- **Taiwan Sustainability Action Awards (TSAA)**
  Gold: 1 House For All
  Gold: NYCU Audio Magazine for Visually Impaired People
  Silver: The Cultural Sustainability Practices of the Seden Glove Puppetry Project
- **Asia-Pacific Sustainability Action Awards (APSAA)**
  Gold: 1 House For All
  Bronze: NYCU Audio Magazine for Visually Impaired People
  Bronze: The Cultural Sustainability Practices of the Seden Glove Puppetry Project
- **4th Global Views USR University Social Responsibility Awards**
  —Model Award, Industry Co-Creation category: Linking Government, Academia, and Industry to Advance Semiconductor & Key Tech Talent Development

2024

- **Taiwan Sustainability Action Awards (TSAA)**
  Silver: Recycling Waste Fishscales for 3D Printing: Circular Design and Associated Field Workshop
  Bronze: Empower_Her: Women in Tech Dialogues
- **Asia-Pacific Sustainability Action Awards (APSAA)**
  Silver: Empower_Her: Women in Tech Dialogues
  Bronze: Recycling Waste Fishscales for 3D Printing: Circular Design and Associated Field Workshop

01

NO HUNGER

2020-2024 Publications	80
2020-2024 Percentage of all Taiwan Publications	10.6%
Course Units	235
Student Engagement with Units on SDG 1	6,247

Research

Assessing Equity in Taiwan's Health-Financing System

Professor Christy Pu of the Department of Public Health examined the equity of Taiwan's health financing system by designing a System of Health Accounts (SHA)-based out-of-pocket (OOP) household questionnaire to produce internationally comparable national-level OOP estimates and evaluate inequality in OOP distribution. This study offers valuable insights for countries pursuing universal health coverage (UHC), and has been published in *Social Science & Medicine*.

Safeguarding the Rights of Persons with Disabilities

Professor Yueh-Ching Chou of the Institute of Health and Welfare Policy investigated disability rights across four Asian countries, comparing the daily experiences of wheelchair- or crutch-using residents in large cities in Thailand, Vietnam, Japan, and Taiwan (10 participants per country). The findings show that disabled people's everyday experiences are shaped by the cultural and historical contexts in which "disability" is constructed. The study calls for a closer examination of attitudinal and cultural barriers to accessibility and for bringing Asian contexts into the political geography of disability. The results were published in the journal, *Political Geography*.

01 NO POVERTY

Social Impact

Ladakh, India Empowerment and Sponsorship Program

In 2025, our university's Jullay International Volunteer Team marked its 15th year of collaboration with the Jamyang School and the ASUS Foundation. Each summer, the team serves in Ladakh, advancing sustained positive change in education, resource support, and cultural co-learning.

- Education and Cultural Exchange. In addition to continuing digital education courses, this year's program introduced new modules on Python programming, mental health, and media literacy. A Senior Student Empowerment Program trained local students to support instruction, deepening two-way interaction and cultural understanding.
- Sponsorship and Resource Support. The team continued the "Big Hand Holds Little Hand" sponsorship initiative to raise educational funds for children in remote areas, and helped Jamyang School establish a multimedia section in the library to improve the learning environment. Service sites have also been expanded to the Likir Monastery School (a Buddhist institute) and Rigjung Public School (Leh branch), broadening the program's reach and social impact.
- Equipment Support. For the Jamyang School, the team secured 10 laptops, 10 desktop computers, and 278 second-hand English books to enrich the library resources. The Likir Monastery School provided six laptops and offered basic computer courses to build digital literacy among young monks. For Rigjung Public School, the team obtained 30 desktop computers, piloted digital courses, and conducted interviews and needs assessments to inform future service models.


Lesson 2
Group 3
Group 5
JULAY
ANGMING

01 NO POVERTY

Education & Cultivation

Subsidizing Overseas Mobility for Economically Disadvantaged Students

- To advance equal educational opportunities and ensure that every student has access to international experiences, the University runs a Short-term Overseas Grant Program for Economically Disadvantaged Students. The program supports students facing economic or social disadvantages to participate in semester exchanges, dual-degree programs, coursework at partner institutions, or overseas internships, thereby narrowing resource gaps. Eligible groups include students from low- and middle-income households, persons with disabilities and their children, students from families in special circumstances, Indigenous students, recipients of Ministry of Education need-based grants, and pregnant students or those caring for children under age three. Applicants who meet the criteria and pass University review receive funding to overcome financial barriers and broaden their global outlook.
- In 2025, the University subsidized 11 economically disadvantaged students for international learning activities: eight undertook semester exchanges in Germany, France, the Czech Republic, Sweden, and Japan; two enrolled in short-term programs at partner institutions; and one completed an overseas corporate internship. The total funding was NT$680,000. With this support, students strengthened their language proficiency, enhanced their cultural adaptability, and built professional competencies, laying a stronger foundation for their future development. The University will continue to leverage institutional resources and diversified support mechanisms to level the starting-line disparities and foster a more equitable, inclusive, and accessible higher-education environment so that disadvantaged students can shine on the global stage.

Stewardship

Admission Channels for Disadvantaged Students

To help more disadvantaged students improve their circumstances through higher education, the university's undergraduate individual application program established the "Tun-Meng Group." This group provides a special admission screening mechanism for disadvantaged students, including lowering entrance exam score requirements, simplifying the screening process, reducing application fees, and offering transportation and accommodation subsidies during the exam period. These measures aim to increase admission opportunities for disadvantaged students, narrow the educational resource gap caused by wealth and urban-rural divides and differences, and create new opportunities for talent cultivation in higher education institutions.

Emergency Financial Assistance

The university has established the "Guidelines for Implementing National Yang Ming Chiao Tung University Student Emergency Relief" in collaboration with campus and social resources to assist students facing financial difficulties due to illness, family emergencies, or unexpected crises. This program provides appropriate financial support through a dedicated account governed by the "NYCU Student Emergency Assistance Regulations." Financial aid ranges from NT$5,000 to NT$30,000, depending on the severity of the situation, to alleviate students' financial burdens caused by illness or unforeseen events, helping them continue their studies without disruption.

02

NO HUNGER

2020-2024 Publications	86
2020-2024 Percentage of all Taiwan Publications	4.7%
Course Units	93
Student Engagement with Units on SDG 2	1,536

Research

A Low-Carbon Model for Smart Aquaculture

Professor Jun-Wei Hsieh's team at our Institute of Computational Intelligence integrated the AIoT with a proprietary vision model, SMILES-Net, to develop an intelligent counting and monitoring system for aquaculture. The solution addresses long-standing pain points in traditional farming, such as time-consuming manual counts, high error rates, and heavy labor costs, by enabling the real-time collection of environmental data and automated estimation of juvenile shrimp counts with approximately 93% accuracy. Using these data, the system optimizes feeding, water exchange, and stocking density management, reducing human error and labor burden while improving post-larvae survival and overall production efficiency. Beyond boosting farm-level performance, the platform advances automation, scalability, and decarbonization in aquaculture, and strengthens food supply resilience through data-driven operations. This study was published in the IEEE Internet of Things Journal.

Dietary Timing and Nutritional Risk in Young Adults

Associate Professor Hsin-Jen Chen of the Institute of Public Health investigated how meal timing and eating behaviors affect body composition and blood pressure in young adults. The study shows that easy-to-implement strategies, such as encouraging regular breakfast and reducing nighttime eating, can effectively improve nutrition-related metabolic risk indicators (e.g., blood pressure, total body fat, and trunk fat), providing an evidence base for campus and community nutrition programs. Compared with calorie restriction alone, aligning meal timing more effectively enhances diet quality and regularity, making it especially suitable for nutrition education interventions targeting youth and underserved populations. These findings were published in the journal, Chronobiology International.

02 NO HUNGER

Social Impact

Building an Age-Friendly Community Through Texture-Modified Diets

Wei-Cheng Ge, a student in our Master's Program in Transdisciplinary Long-Term Care and Management, founded the team "Friendly Meals & Swallowing Care" (友膳食嚥家) to integrate long-term care, social work, nutrition, and medical expertise with a focus on improving older adults' food quality and safety. Anchored in the International Dysphagia Diet Standardisation Initiative (IDDSI) framework, the team designs and implements texture-modified meals in long-term care facilities, combining local ingredients with festive traditions to deliver menus that are palatable, safe, and resonant with memory. Beyond menu development, the team conducts workshops and hands-on training to build capacity among frontline caregivers and local communities, gradually establishing a self-sustaining, age-friendly food ecosystem. The project was recognized by the jury of the 2024 "Community as One" program, receiving the Exemplary Award in the Happy Community category.

Cross-Campus Deployment of a Smart Chinese Herbal Garden to Drive Sustainable Agricultural Transformation

Leveraging our university's advanced R&D capacity in smart agriculture, we converted cross-campus collaboration into a tangible social impact. In May 2024, the nation's first Smart Chinese Herbal Garden was inaugurated at the Beigang Branch of the China Medical University. The core technologies were provided by the biotechnology team led by Prof. Wen-Liang Chen, Chair of the Department of Biological Science and Technology, and the Internet of Things (IoT) team led by Distinguished Chair Professor Yi-Bing Lin of the Department of Computer Science, with technical support from Quanta Computer and Chunghwa Telecom. The garden adopts our smart-agriculture solution that integrates IoT field sensors and actuators, cloud data transmission, and AI analytics to enable remote, precision control of irrigation, fertilization, and environmental parameters. Through technology transfer and the co-creation of teaching sites, both institutions are jointly cultivating the next generation of talent in smart agriculture and traditional Chinese medicine, accelerating the modernization and internationalization of the Chinese herbal industry. By applying innovative technologies, the initiative strengthens the safety, accessibility, and sustainability of both food and medicinal crops.

Education & Cultivation

Reframing Food and Sustainability Through Art

To deepen public engagement with global food issues, our university uses cross-disciplinary art collaborations as a bridge. We invited France-based artist Joanna Wong, a founding member of the Enoki Collective, to curate on-campus exhibitions and interactive programs centered on the farm-to-table food system. Through horticultural and culinary practices, the project extends food beyond physiological nourishment to illuminate its role as cultural memory, social connection, and a medium of quiet resistance. Guided by a relational aesthetics framework, the exhibition unfolds along three themes—food and migration, food as nourishment, and food as social resistance—linking the fieldwork, kitchen, and gallery to spark public dialogue around food. Through the transformation of art and interactive learning, our school advances food issues from knowledge understanding to action participation, raising public attention to aspects such as nutritional accessibility, leftover food, and fair distribution, and using humanistic care to promote a more equitable, inclusive, and sustainable food future.

Special Lecture Series on Food Safety and Health Risk

On October 29, 2024, our university's Institute of Food Safety and Health Risk Assessment hosted a three-part lecture series to highlight forward-looking topics in food safety, functional microbes, and health risk assessment. The program opened with Dr. Hsiao-Wen Huang from SYNBIO TECH, who examined microbial safety controls across food-processing workflows and the development of functional microorganisms, emphasizing the pathways for translating academic research into industrial applications. The second lecture, "Food Safety and Health Risk Assessment in the Post-Pandemic Era," analyzed the global challenges that have emerged after COVID-19 and outlined the corresponding assessment frameworks and response strategies. The final session approached health risk assessment from a bioinformatics perspective, explaining how physiological biomarkers can be applied to evaluate risk, and illustrating the field's cross-disciplinary advances. Through this series of lectures, teachers and students can grasp the latest trends in food safety, and understand the role of microbial technology, epidemic challenges, and data analysis in food security.

Stewardship

Building a Sustainable, Healthy, and Equitable Campus Dining System

Our university is committed to a campus dining system that is safe, nutritious, affordable, and environmentally friendly, advancing dietary sustainability through two pillars: ensuring food equity and reducing food waste. To enhance accessibility and health, we collaborate with on-campus vendors to offer budget-friendly meal boxes that balance nutrition and price, and partner with campus convenience stores to provide discounted options. For students facing financial hardship, we distribute meal vouchers of NT$200 per person, creating an inclusive support system that ensures all students have access to sufficient, high-quality nutrition. Improvements have been made in waste reduction from the supply chain to the point of consumption. Vendors are encouraged to prepare food flexibly based on daily demand, convenience stores offer markdowns on items nearing their sell-by date to reduce leftovers, and outreach and coursework integrate the principles of taking appropriate portions and avoiding waste into everyday learning and living.

03

GOOD HEALTH AND WELL-BEING

2020-2024 Publications	7,262
2020-2024 Percentage of all Taiwan Publications	16.1%
Course Units	2,087
Student Engagement with Units on SDG 3	38,703

Research

Breakthroughs in Bioprinting and Biomimetic Materials

Inspired by spider silk, Associate Professor Ming-Chia Li (Department of Biological Science and Technology) and his team developed a self-healing nanocomposite hydrogel. Using biomimetic 3D printing, the material can form a helical 24-faceted polyhedral cell scaffold and human auricle without support structures. By emulating the spider's salting-out mechanism, the team exposed the hydrogel to a high–ionic strength environment, inducing helical entanglement of protein molecules that markedly enhanced mechanical properties and printing stability. Coupled with a digital-twin workflow—building personalized digital phantoms from biomedical imaging, running fluid-dynamics simulations, and feeding results back into printing—the platform enables customized applications in regenerative medicine, reconstructive surgery, and cartilage tissue engineering, while reducing reliance on animal experiments, thus promoting animal welfare. This work was featured as a 25th-anniversary cover story in Biomacromolecules.

Health Risk Assessment of Tobacco Products

Professor Hsiang-Tsui Wang (Institute of Pharmacology) and colleagues used advanced chemical analytics to compare aerosols from heated tobacco products with the smoke from conventional combustible cigarettes. The results showed that heating, rather than combustion, substantially reduces the emissions of multiple known toxic and carcinogenic compounds. The team also identified distinct aerosol chemical profiles between the two product types, consistent with the findings reported by the U.S. FDA, Germany's BfR, and Japan's National Institute of Health Sciences. These data provide important scientific evidence for risk assessment, tobacco control efforts, and public health policy. The study has been published in the journal, Regulatory Toxicology and Pharmacology.

03 Good Health and Well-Being

Social Impact

AI-Empowered, All-Ages Healthy Living Community

Aligned with the Phase II expansion of our affiliated hospital, our university and Chateau Group launched an AI-enabled Continuing Care Retirement Community (CCRC) initiative to create a model for an all-ages healthy living community behind the Yilan Train Station, adjacent to the university hospital. Centered on the integration of healthcare, long-term care, and AI, the plan includes smart wellness residences and a smart medical–care hotel. Residences will incorporate health management systems and universal, barrier-free designs to strengthen in-home health and safety. The hotel will function as a post-acute transition space that provides continuous care and supports patients in smoothly returning to their home life. The plan combines BOT development and smart medical care services to respond to the local needs of Yilan's elderly population, which is close to 20%, and to improve the efficiency of medical care integration and community health resilience. This cooperation is expected to become a benchmark for age-friendly, healthy, and long-lasting communities.

Deepening Community for Sustainable Health Care

The hospital affiliated with our school held the 13th Crusade Yilan Team's "Crossing the Past and Deeply Cultivating Lanyang" event, and launched a five-day community care visit. They went to various areas of Yilan City to conduct home health examinations and questionnaire surveys for the elderly, and continued to promote the "Healthy and Lively Yilan City Community Care" plan. Since the launch of the project, more than 3,000 health tracking questionnaires have been completed, and the survey has been expanded to all areas of the city. Years of data show that the proportion of older adults' perceived health and happiness has increased year by year, demonstrating the effectiveness of community health promotion and long-term care policies. The plan uses institutionalized generational health tracking to accumulate transparent and credible local epidemiological data as a scientific basis for public policies and long-term care planning. It also connects campus and medical resources to expand health promotion and long-term care bases. With the vision of "healthy aging, aging in place, and peaceful death," it consolidates trust in the public medical system and improves care for the vulnerable, creating a sustainable local health care system.

Education & Cultivation

Co-Educating the Next Generation of Medical Professionals

Our university is advancing the University & High School Co-creating Online Learning (UHCOOL) initiative in partnership with the New Taipei City Government and practicing clinicians to build a collaborative model of medical education. University professors, clinical physicians, and high school teachers co-designed a high-quality Introduction to Medicine digital course, providing at least 20 hours of instruction with companion materials. A dedicated learning and interaction space was set up for partner schools on the ewant Open Education Platform, alongside teacher upskilling and instructional support. This project breaks through the connection threshold between higher medical education and high school, allowing high school students across the country to have early access to cutting-edge medical knowledge, cultivate scientific literacy and career vision through inquiry-based learning, and encourage young people to invest in the medical and public health fields through the improvement of early health and medical literacy.

International Collaboration in Digital Dentistry

Our School of Dentistry promotes the "Southeast Asian Dental Expert Training Program" and invites 30 experts and scholars from seven countries, including Vietnam, Indonesia, and Malaysia, to study at the school. The course focuses on 3D printing, smart diagnosis and treatment systems, and digital treatment plans to strengthen students' ability to apply digital dentistry to local medical services. During the 2024 event, the School of Dentistry signed a memorandum of cooperation (MOU) with five top dental schools in Southeast Asia to deepen academic exchanges and clinical technology sharing and establish a long-term cooperation mechanism between the two parties. This project uses technical training and institutionalized partnerships to advance dental care in the Asia-Pacific region.

Stewardship

Co-Creating a Smoke-Free, Sustainable Campus Across Disciplines

With a vision of “healthy, safe, and smoke-free,” our university’s Health Services Division (Office of Student Affairs) launched the New Wave of Tobacco Refusal initiative to build partnerships between administrative units and student communities, and to catalyze campus-wide health promotion. Moving beyond one-way messaging, the program connected the Puppet Theater Club and the Hip-Hop Dance Club to co-produce anti-smoking videos that blended traditional and contemporary aesthetics. An integrated communication strategy spanning social media, campus digital displays, and freshman orientation simplified the message, shaping a shared language and a collective commitment to rejecting tobacco harm. Centered on student empowerment and cross-domain collaboration, this model converts artistic energy into health advocacy momentum, strengthening campus health literacy and creating a supportive environment.

Breast Cancer Prevention Through Social Engagement

In response to International Breast Cancer Awareness Month, the University’s Sustainable and Peer Education Center partnered with the Hope Foundation for Cancer Care to run a crochet prosthetic breast workshop, a triadic model combining health education, skills training, and social service. The plan is to recruit faculty and students to learn crocheting techniques and make prosthetic breasts for the transitional period after surgery to help patients maintain body balance and prevent scoliosis. Handwritten cards will also be attached to provide warm companionship, both physical and psychological support. Our school acts as a platform and training hub, from providing venues and resources to connecting non-profit organizations, establishing a service chain of "campus - public welfare - medical care." The finished products are donated by the foundation to the first-line breast medical center to ensure accurate resources.

04

QUALITY EDUCATION

2020-2024 Publications	174
2020-2024 Percentage of all Taiwan Publications	4.0%
Course Units	4,846
Student Engagement with Units on SDG 4	92,858

Research

Advancing Digital Teaching Innovation in Higher Education

At the 2024 International Conference on Digital Learning and Open Education Forum (ELOE), the inter-university "Medical, Agriculture, Arts, and Engineering Alliance" was recognized for its strong foundation in digital pedagogy and course design. Among the highlights, Associate Professor Ken-Zen Chen (Institute of Education) collaborated with international scholar Barbara Oakley on the course "Learning How to Learn." The project was selected as a successful case and presented a high-efficiency digital course design methodology that balances global reach and local needs. It received the "Teaching Case of the Year" award, and the related outcomes were published in the *International Journal of Educational Technology in Higher Education*.

Strengthening Computational Thinking and Programming in Elementary Students

Associate Professor Tzu-Chi Yang from the Institute of Education investigated the use of graphic organizers (GOs) as instructional scaffolds to enhance elementary pupils' computational thinking and programming learning. The study found that while all students recognized the importance of using computational thinking to solve problems, those taught with GO-based instruction significantly outperformed their peers on three indicators: computational thinking performance, programming skills, and flow experiences. The study was published in *Computers & Education*, and the work provides empirical evidence to inform elementary-level cross-disciplinary competencies, teacher professional development, and curriculum design.

Social Impact

Co-Developing the Next Generation of Tech Talent with Local Government

In partnership with the Taoyuan City Department of Education, the University hosted the “Make Friends with AI—Hands-on Boot Camp,” providing more than 100 high school students with a systematic pathway from AI fundamentals to practical implementation. The curriculum covered core technologies, including machine learning, deep learning, and natural language processing, paired with capstone projects and presentations to spark interest while strengthening model development and scenario-based application skills. Industry experts were invited to share real-world practices and discuss copyright issues surrounding generative AI, fostering responsible technological literacy, aligning learning with industry needs, and cultivating a globally competitive new generation of AI talent.

“Gong Academy”: A New Model for Later-Life Education

Drawing on resources from eleven colleges, and launched with support from TSMC and the Hsinchu Science Park Industry–Academia Training Association, the University established the “Gong Academy,” named in reference to the historical gongshi (tribute examination). Integrated with the existing “University for Active Aging” and the “Silver Fitness Club,” it forms a “social-responsibility triad” for older adult education. Centered on lifelong learning, the program welcomes mid- to older-age learners back to campus for courses in brain health, personal finance, wellness, AI literacy and sharing, and language. It incorporates semiconductor process sensing and physician-supervised health technology assessments, and uses assignments and evaluations to build systematic learning records. Through cross-generational learning and industry–academia linkages, the program supports sustained engagement in health, learning, and social participation, promotes knowledge reuse and social contribution, and advances an inclusive, lifelong learning ecosystem.

Education & Cultivation

Integrating High School–University Resources to Enhance Learning Quality

The Affiliated Chu Pei Senior High School of National Yang Ming Chiao Tung University admitted its first class in the 2025 academic year, marking a new milestone for the university. The High School will serve as the university's focal point for high school education, integrating academic resources and facilities across its campuses. It will also offer curriculum planning consultations, comparable to high schools nationwide and those in Greater Hsinchu, to enhance learning outcomes and quality. The newly relocated High School will offer a “Bilingual Biomedical Experimental Class” and an "Electrical Engineering and Information Experimental Class" in the 2025 academic year. The university will provide access to the ewant open education platform and integrate ewant courses with APX Mathematics and Science exams to systematically guide students in their independent participation in AP international courses, making international education more accessible and affordable at the high school level.

Expanding Self-Directed Learning through ewant Cross-University Courses

NYCU’s ewant open education platform participated in the “2024 International Education Innovation Expo,” showcasing quality education outcomes to education groups from 50 countries. The platform highlighted two flagship initiatives: the “Inter-University General Education Digital Course Program” and “SOS! Summer Online School,” through which over 40,000 university students have successfully earned credits, breaking down inter-institutional barriers and expanding access to learning. In parallel, the “Digital Learning Enhancement Program for Senior High and Vocational Schools” now partners with nearly 200 high schools, encouraging students to pursue self-directed learning via digital resources to strengthen their subject foundations and explore cross-disciplinary interests. Through cross-campus collaboration and a diverse portfolio of courses, ewant not only enhances educational quality and a supportive learning environment, but also underscores NYCU’s international impact on educational innovation and social responsibility.

04 Quality Education

Stewardship

Linking Orientation to Sustainability Education

During the 2024 Freshman Week, the University wove “Culture × SDGs” into campus tours and themed activities so that new students could familiarize themselves with learning spaces while grasping the University’s history and the core values of sustainability education. Through guided tours, interactive learning, and immersive experiences, campus cultural heritage and sustainability principles were translated into a learning journey that was tangible, participatory, and actionable, lowering barriers to entry and boosting engagement. This governance approach, co-led by university-level units, positions orientation as the first lesson in quality education, nurturing environmental responsibility and social care from the moment of matriculation, strengthening identification with and commitment to the SDGs, and embedding sustainability literacy systematically across formal and informal learning.

Sustainability Week Showcasing USR and SDG Practices

To deepen campus understanding and practice around climate change and sustainable development, NYCU held a Sustainability Week in April 2024, integrating education, research, and action to showcase concrete climate and sustainability initiatives. The program was coordinated with the 2024 Bamboo Expo & World Bamboo Forum, drawing 600+ international scholars, NYCU faculty and students, and local community members, and strengthening public–private collaboration and cross-sector dialogue. Highlights included a Sustainability Poster Exhibition and a USR × SDGs Showcase, which invited units across the University to share climate and environment-related projects, expand resource linkages on and off campus, and cultivate a community of practice with strong execution capacity. The Climate Tipping Point Film Festival pairs films with dialogue to deepen public understanding of climate risks and increase participation in sustainable action. A Sustainability Market promotes local agricultural products and eco-friendly goods, reinforcing support for sustainable agriculture and a low-carbon economy while advancing social resilience and climate adaptation.

05

GENDER EQUALITY

2020-2024 Publications	72
2020-2024 Percentage of all Taiwan Publications	8.4%
Course Units	158
Student Engagement with Units on SDG 5	3,805

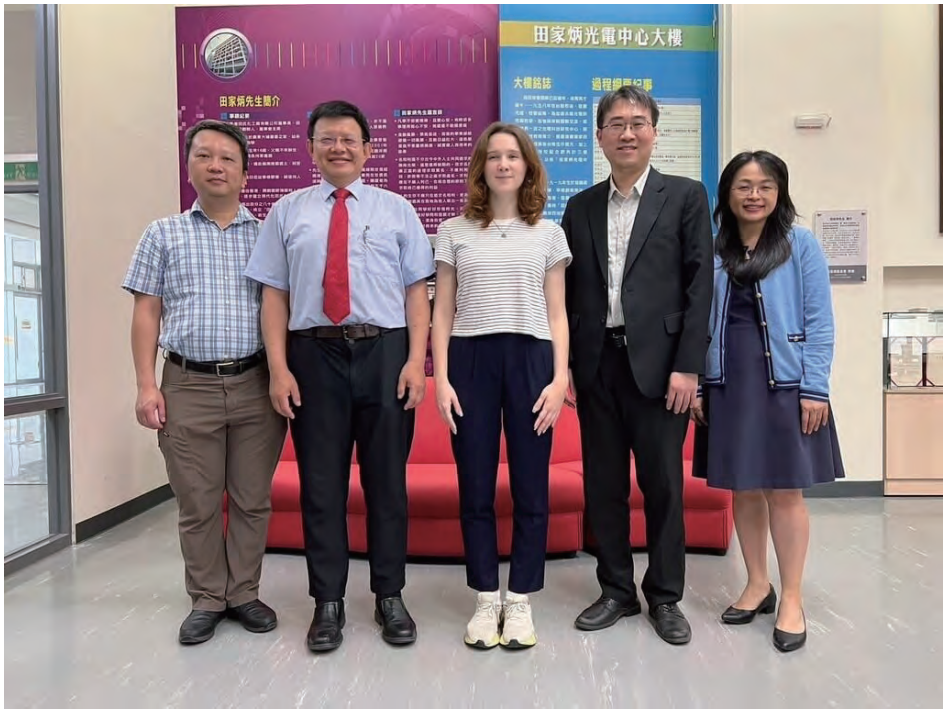
Research

A Women-Friendly Research Environment

The College of Electrical and Computer Engineering continues to advance gender equality and foster a diverse and inclusive learning environment, empowering students to shape future trends and realize a vision of sustainable development. At present, women account for nearly 20% of undergraduates in the Department of Electrical Engineering, the combined proportion of women in the Department of Photonics and related graduate programs is close to 30%, and approximately 30% of the Department of Photonics faculty are women. These results reflect the sustained participation and growth of women in technology, and underscore the college's commitment to gender equity.

Detecting Gender Discrimination in Social Media Content

Professor Lung-Hao Li of the Institute of Artificial Intelligence Innovation led the NYCU-NLP team in the EXIST sexism detection challenge at the 15th Conference and Labs of the Evaluation Forum (CLEF 2024). This project focuses on the automated identification of sexist content on social media, including determining whether posts contain sexism, classifying the author's intent, and assigning fine-grained categories of discrimination. The team achieved excellent results, demonstrating the effectiveness of advanced NLP techniques in detecting gender-discriminatory content on social media platforms.



Social Impact

A Women-Friendly Research Environment

Distinguished Professor Chih-Chieh Lin of the School of Law actively advocates for gender equality. In 2025, she was invited to deliver a keynote lecture for Pingtung County's "Women's Month," speaking on "The Rise of Women in Global Trends." Drawing on recent women's movements, she investigated the #MeToo movement, digital sexual violence, women's employment, and economic empowerment, and explored women's influence across technology, law, and public policy. Professor Lin was also invited by the Yunlin District Court to give a special lecture, "New Challenges in Gender Equality," covering the historical trajectory of gender equality, reproductive autonomy, assisted reproduction, digital sexual violence and victim protection, and women's leadership models. She emphasized that gender equality is not only a key indicator of social progress but also the foundation of a just, inclusive, and sustainable society, calling on the public to sustain attention and support ongoing reforms.

5 GENDER EQUALITY

Lifestyle Festival and Gender-Friendly Week

To further promote gender equality and pluralistic values, the University hosted the “2024 NYCU Lifestyle Festival & Gender-Friendly Week” from April 24 to May 5, 2024, combining markets, film discussions, and issue-focused workshops to help participants approach gender topics from multiple perspectives and foster a welcoming atmosphere on campus.

- The Lifestyle Festival — “Jíxìláng” (幾系郎) integrated gender issues into a campus market format through an NGO and cultural-creative market, a lifestyle food market, and a military-experience event, enabling attendees to encounter gender-friendly ideas through interaction, dining, and cultural activities.
- The Gender-Friendly Week — “CLOSE TO CLOSE,” the workshop “Gender Brainpower” featured cross-disciplinary experts who guided faculty and students to consider connections among gender, digital technologies, national defense, and war, and to reflect on the many dimensions of gender equality. The film night “Gender, Chill for a While” used cinematic narratives to introduce transgender experiences, same-sex relationships, and diverse gender identities to the audience.

Education & Cultivation

Gender Equality Education Outreach

In 2024, the University's Mental Health and Counseling Center actively promoted gender equality education, organizing nine events with a total attendance of 311. Combining educational and reflective elements, the program featured film discussions and thematic lectures to deepen faculty and students' understanding of and sensitivity to gender issues.

- The film series, facilitated by licensed counseling psychologists, offered post-screening dialogues under the themes "The Abyss of Love: Psychedelia and Reality" and "From Film to Feelings with Your Psychologist." Using scenes from the films, the discussions guided participants to examine gender expression, sexual orientation, gender identity, the spectrum of gender diversity, gender stereotyping, and gender discrimination.
- A thematic lecture, "Everyday Feminism: Seeing Equality Through Everyday Gendered Experiences," explored the current state of gender equity in Taiwan, and invited the campus community to consider how to practice gender-friendly behaviors in daily life, advancing diversity and equality on and off campus.

Capacity-Building Lecture on Gender Equality

In October 2024, the Sustainable and Peer Education Center co-hosted an interdisciplinary community event, "Gender OPEN MIC, OPEN MIND," which focused on gender in sports. Yi-Fei Wu, Chairperson of the Kaohsiung Association for the Promotion of Women's Rights, was invited as the speaker. Drawing on examples from athletic settings, she discussed how gender differences shape participation in sports, and analyzed the ways in which competitive performance can be affected by gendered factors, prompting attendees to reflect on the interplay among sports, gender, and sociocultural contexts.

Stewardship

Universities Partner with the MOE to Advance Gender Equality Education

In 2024, the Ministry of Education established four regional Gender Equality Education Promotion Centers, aiming to move gender equality education from being promoted by a single school to being networked, normalized, and professionalized. With our university serving as the hub for the North District Center, we will collaborate with Shih Hsin University, National Changhua University of Education, and Kaohsiung Medical University to strengthen the promotion of gender equality in higher education. Our university will integrate regional resources, identify trends, and provide consultation and support for gender equality issues at each school. Through regular work meetings and workshops, we will enhance the professional expertise of the organizers and committee members and help establish and refine the operational systems of each school's Gender Equality Education Committee.

Gender Mainstreaming Mechanism

Our university is implementing a gender mainstreaming program that applies gender awareness capacity building to both personnel policies and campus facilities. The primary promoting body is the University Gender Equality Education Committee, which operates four subgroups:

- **Activities Group (Office of Student Affairs):** Responsible for course offerings and activity design. Students should be encouraged to realize their potential without any differential treatment based on gender. Relevant departments are encouraged to expand gender-related curricula and develop gender-equitable course planning and assessment methods.
- **Teaching Group (Office of Academic Affairs):** When selecting teaching materials and conducting instruction, faculty should demonstrate gender-equality awareness, challenge gender stereotypes, and avoid gender bias and discrimination. Faculty are also expected to encourage students to explore academic fields that are non-traditional for their gender.
- **Space Group (Office of General Affairs):** Charged with providing a learning environment that upholds gender equality. Campus planning and facilities should respect and accommodate differences in gender, gender traits, gender identity, and sexual orientation, and ensure a safe campus space for all faculty, staff, and students to work and study.
- **Prevention and Handling Group (Health and Counseling Center):** Handles complaints related to gender-based incidents in accordance with the law. The group convener may designate or rotate committee members to form a panel of three or more members to decide whether to accept a case. If accepted, the panel determines whether to establish an investigative committee; when such a committee is created, it is authorized to finalize the list of investigators.

06

CLEAN WATER AND SANITATION

2020-2024 Publications	143
2020-2024 Percentage of all Taiwan Publications	4.0%
Course Units	36
Student Engagement with Units on SDG 6	380

Research

Green Innovations in Wastewater Treatment

NYCU's Environmental Technology and Smart System Research Center, Industrial Wastewater Group, focuses on the treatment and reuse of industrial effluents, pursuing both process optimization and next-generation technology R&D with pilot testing. The team has developed a circulable, low-carbon catalytic technology (COAC) that efficiently removes pollutants, particularly from high-strength industrial wastewater. The process features low carbon emissions, low sludge generation, and low energy consumption, reducing operating costs while improving treatment efficiency and stability, and enabling in-plant water recycling and reuse.

Renewable Solutions for Groundwater Purification

Addressing the detection of PFAS (perfluorinated/polyfluoroalkyl substances) in discharges and groundwater near semiconductor, dyeing/finishing, and electroplating industries, Deputy Director Shanshan Chou and colleagues at the Environmental Technology and Smart System Research Center have developed a treatment train centered on regenerative adsorption particles (RAP). By integrating adsorption, catalytic oxidation, and in situ regeneration, the optimized process was validated at potential contamination sites. The results show that RAP can be effectively regenerated after adsorption and catalytic oxidation, maintaining its activity for repeated use, making it a durable solution for PFAS groundwater remediation. This outcome offers a scalable technical pathway that balances performance, cost, and sustainability, thereby strengthening risk control and governance resilience in water environments surrounding industrial clusters.

06 CLEAN WATER AND SANITATION

Social Impact

Ocean & Everyday Life: Popular Science Outreach

NYCU's Disaster Prevention and Water Environment Research Center co-hosted the 2024 Ministry of the Interior Smart 3D Surveying Workshop — "Ocean and Life: Spatial Information" at the National Museum of Marine Science & Technology. Together with Professors Tian-Yuan Shih and Tee-Ann Teo from the Department of Civil Engineering, lecturers from the Central Weather Administration and the Museum led talks and guided tours for high school students. The program introduced core concepts such as vertical datum, geodesy, and tide-gauge observation, and showed their practical applications in sea-level change monitoring, coastal disaster prevention, port operations, and everyday life. Through scenario-based cases and on-site tours, participants strengthened their hydrological observation literacy and scientific reasoning, laying the groundwork for future engagement in community and public governance.

Taiwan–India Water Environment Partnership: Exporting Taiwan's Groundwater-Remediation Experience

In line with the New Southbound Policy, NYCU's Center for Environmental Technology and Smart Systems mobilized resources across industry, government, academia, and research to collaborate with India on groundwater pollution remediation and emerging wastewater treatment technologies. In 2024, the initiative completed three phases:

- Taiwan–India Bilateral Online Forum on a Sustainable Water Environment: Co-organized with the IIT Madras International Centre for Clean Water (ICCW), the forum focused on challenges and opportunities in industrial wastewater treatment and reuse, engaging approximately 70 participants.
- In-Depth Visit to India: The NYCU team met with government agencies, chambers of commerce, and research centers to map governance roles and water supply targets. The visit confirmed that Environmental Technology Verification (ETV) would facilitate the localization of Taiwan-developed technologies, and identified local needs such as desalination and salt recovery, inorganic/organic sludge treatment, biomass conversion, and zero liquid discharge.
- Taiwan-India Practical Water Environment Protection and Management Forum: Focusing on "India's water treatment needs," the forum invited two Indian experts to Taiwan, bringing together 50 representatives from industry, government, academia, and research. The following day, the forum included a visit to the Hsinchu Science Park wastewater treatment plant and a technical discussion. The forum also included in-depth discussions on key technologies with our university and the Industrial Technology Research Institute's Materials and Chemical Engineering Research Institute.

Education & Cultivation

Transnational Co-Creation in Water-Resource Design Practice

The Institute of Applied Arts at NYCU and the Design Academy Eindhoven (Social Design MA) co-ran the course “The Water Council of Relationality,” taking water as encountered in both Taiwan and the Netherlands as the central theme. A fictional institution served as the pedagogical framework, linking design, humanities, science, and local knowledge. Working in teams, the students conducted fieldwork and gathered data to understand the historical contexts and scientific foundations of water governance, marine ecology, climate change, and technology industries in both regions. Through information visualization, materials experimentation, and curatorial practice, they presented future-oriented and research-driven design proposals at the end of the semester. As a platform for cross-border, inter-university collaboration, the course moved water and sanitation topics from knowledge acquisition to design practice and public communication, deepening campus and public engagement with water issues in the process.

Watershed Restoration and Water Culture Forum

NYCU’s International Center for Cultural Studies hosted the forum “Watershed Re-Making on Taiwan’s West Coast,” foregrounding urban development and hydrological change. Drawing on walking field-study experiences in Taoyuan, Hsinchu, and Taipei’s Shezi Island, the program examined water history and culture, the postwar groundwater governance regime and its breakdown, and the blue–green infrastructure in urban planning. Through keynote talks and dialogues with local practitioners, the participants explored the governance challenges and restoration pathways for western Taiwan’s river basins under rapid urbanization. Scholars from Academia Sinica and National Taiwan University presented research, while community groups, including the Environmental Rights Protection Foundation, Taiwan Clean Water Action Alliance, and Shezi Island organizers, offered proposals for public participation and site-based water governance practices.

台島西部「流域改」讀書會/走讀

06 CLEAN WATER AND SANITATION

圖／新竹城市博物館（2024）汀甫圳渡槽[illegible]客雅溪、成德路
https://hsinchucitymuseum.hccg.gov.tw/home/[illegible]/assets/757

Stewardship

Smart Water Services for a Sustainable, Clean-Water Campus

Since 2016, the University has phased in a Campus Energy and Water Resource Management System. By 2024, more than 100 smart water meters had been installed across campuses and integrated into a cloud-based Energy Management System (EMS) to display real-time consumption, nighttime base-flow, abnormal peaks, and district balancing. The system issues leak alerts, benchmarks usage against baseline targets, tracks water-saving performance, and generates audit reports, enabling building-level water management and pipeline leak control, and informing decisions on equipment replacement, repairs, and conservation investments.

To ensure clean, safe drinking water for the campus and surrounding community, we operate a routine water-quality maintenance program: monthly sampling of drinking fountains for physicochemical and microbial indicators with regular filter replacement; annual cleaning and disinfection of each building's water tanks, including checks of refill, overflow, and vent safety mechanisms; and scheduled maintenance of the on-campus wastewater treatment plant, including equipment servicing, chemical dosing calibration, and sludge removal to keep effluent stable and compliant.

Regarding resource recycling, a rainwater retention system was installed on campus for flushing toilets in buildings and irrigating campus plants, reducing tap water demand and improving resilience during dry seasons. Real-time data and maintenance records were integrated into the EMS to quantify water conservation efforts. Through data-driven governance and water recycling, the campus water resource system comprehensively improves water-use efficiency, drinking water hygiene, and water environment quality, while also balancing the health of faculty and students, community service, and sustainable development goals.

07

AFFORDABLE AND CLEAN ENERGY

2020-2024 Publications	1,038
2020-2024 Percentage of all Taiwan Publications	8.4%
Course Units	186
Student Engagement with Units on SDG 7	2,613

Research

Advanced Energy Materials and Applications

The Advanced Energy Materials and Applications of NYCU's Center for Emergent Functional Matter Science (CEFMS) integrates key solar and hydrogen technologies to convert solar energy efficiently and store it as hydrogen. The research focuses include the development of novel photo/electrocatalytic materials and catalysts to enable solar-powered water splitting for hydrogen, ammonia cracking for hydrogen, and CO_2 reduction to methane and other green fuels. The team is developing large-area, high-performance, next-generation solar cell modules as power sources for photoelectrocatalytic reactions. Focusing on long-term stability, low precious metal usage, and scalable manufacturing processes, they are creating next-generation energy storage and fuel preparation technologies with high conversion efficiency, scalability, and low carbon footprints to support net-zero carbon emissions and clean energy goals.

Frontier Power Electronics Center

The Advanced Power Electronics Center of NYCU's College of Electrical and Computer Engineering focuses on core power electronics technologies for high-efficiency power conversion and power management across applications, including renewable energy, high-efficiency power supplies, motor drives, smart lighting, and battery management. The Center integrates power electronics, microelectronics, automatic control, and power module packaging to develop high-performance power ICs, power modules, and complete systems while building a comprehensive talent pipeline. Dedicated laboratories span power electronics systems and IC design, power-management ICs, battery-management ICs, servo and motion control, and applied power electronics. With five full-time faculty members and over 60 master's and doctoral students, the Center provides robust R&D and training capacity. Through technological innovation and cross-disciplinary integration, it supports industrial upgrading, enhances renewable grid integration efficiency and demand-side energy savings, and advances sustainability goals in clean energy and industrial innovation.

Social Impact

Tang Prize Master Forum Highlights Breakthroughs in Energy Materials

Co-hosted by NYCU and Taiwan's Industrial Technology Research Institute (ITRI), the Tang Prize Master Forum featured Prof. Omar M. Yaghi, the 2024 Sustainable Development Laureate, who presented frontier advances in metal–organic frameworks (MOFs) and covalent organic frameworks (COFs). The forum underscored how MOFs/COFs—with their ultrahigh surface areas and designable pore architectures—can enable high-density, safe storage of hydrogen and methane, thereby improving the feasibility of renewable energy in transport and end-use applications. Coupled with CO_2 capture, these materials support a dual-axis decarbonization pathway that lowers the carbon footprint of fossil fuel use while accelerating clean energy deployment. Looking toward 2050 net zero, the discussants explored AI-driven material design and how to align Taiwan's manufacturing and scale-up capabilities to accelerate commercialization. The forum linked world-class science with Taiwan's engineering strengths to chart clear technical and collaborative routes for achieving clean energy.

Fusion R&D and Talent Hub

Our university has partnered with Alpha Ring Clean Energy to establish a nuclear fusion laboratory (its fourth globally) on the Guiren Campus in Tainan. Together, they are fostering a "nuclear fusion ecosystem" to promote technological research and development, education, and industry implementation. Alpha Ring has implemented the world's first Alpha-E nuclear fusion education system (integrated hardware, software, curriculum, faculty, and consulting) to support teaching and practical application of deuterium-tritium and hydrogen-boron reactions, cultivating the next generation of nuclear fusion and advanced energy professionals. The laboratory will focus on nuclear fusion module and system design, technology transfer, and commercialization. Through workshops and cross-disciplinary projects, the laboratory will strengthen clean energy R&D capabilities, expand talent supply, and enhance international connections, providing long-term momentum for Taiwan's energy transition and its sustainable development.

Education & Cultivation

Cross-Disciplinary Innovation across Theater, Energy, and Food

As part of the NYCU X Cross-Disciplinary Lecture Series, the founders of 8more shared their entrepreneurial journey from cultural and creative industries into technology and food, demonstrating how to embed sustainable energy thinking and business model innovation into product R&D, supply chain management, and brand strategy. Through real-world case analyses, the talk unpacked energy efficiency, low-carbon processes, and circular packaging during industry transformation, while interactive discussions guided students and faculty to see how cross-domain collaboration links technology adoption, market validation and social impact. The event broadened campus perspectives on renewable energy applications and industrial sustainability, strengthened innovation and entrepreneurship capabilities, and cultivated talent with energy literacy and systems thinking.

Cultivating Talent in Lighting and Energy Photonics

NYCU's Institute of Lighting and Energy Photonics of the College of Photonics is guided by industry needs, and cultivates master's and doctoral-level professionals in lighting and energy optoelectronics, as well as in semiconductor manufacturing processes. Research focuses on three key areas: high-efficiency energy-saving lighting technology, high-efficiency solar cells, and novel optoelectronic materials and advanced device technology.

The curriculum spans organic/inorganic optoelectronics, the principles and frontiers of solar cells, thin-film and nano-optics, metamaterials, optoelectronic device physics, and semiconductor lasers with process practicums. Through cross-disciplinary coursework and laboratory training, students build immediately deployable R&D capabilities in high-efficiency energy saving, renewable-energy optoelectronics, and advanced semiconductor devices, forming a complete competency chain from materials and design to process and manufacturing, and supplying high-caliber R&D talent to Taiwan's clean-energy and optoelectronics industries.

Stewardship

Low-Carbon Compute Powered by a Green Data Center

NYCU has launched an AI high-performance computing platform. Coordinated by the IT Services Center, the platform integrates a resource scheduler and management software stack, a high-throughput parallel file system for AI, and a high-bandwidth switching fabric to support elastic multi-GPU cluster workloads, thereby meeting strong cross-disciplinary research demands. The practical benefits are already evident: the College of Electrical and Computer Engineering team reduced the time required to complete the same experiment on the platform from one day to approximately two hours, and with four times the memory expansion, they were able to train a more efficient model. The platform is integrated into the campus's green energy computer lab, reducing energy consumption and carbon emissions through efficient cooling and energy management, while maintaining the university's existing security mechanisms to ensure operational safety.

Smart Microgrid to Strengthen Power Resilience

To achieve both decarbonization and supply resilience, the university is planning and implementing a campus microgrid based on three pillars: conserve, generate, and intelligently dispatch.

- **Conserve:** Annual efficiency projects and equipment renewals, including LED lighting, higher-efficiency HVAC and chillers, lab/data-center power optimization, peak/off-peak scheduling, and lower high-voltage loads, reduce outage risk and curb electricity costs and carbon emissions.
- **Generate:** Rooftops, carports, and suitable building-integrated PV sites have been assessed for grid-tied or self-consumption modes. Coupled with energy storage, the system discharges at peak and charges off-peak to increase renewable self-consumption and stabilize the campus grid.
- **Intelligent dispatch:** An Energy Management System (EMS) integrates smart meters, PV, storage, and critical loads; establishes baselines; provides real-time monitoring and anomaly alerts; and supports schedule-based control with carbon/cost performance tracking—informing equipment replacement and investment decisions.

08

DECENT WORK AND ECONOMIC GROWTH

2020-2024 Publications	126
2020-2024 Percentage of all Taiwan Publications	3.3%
Course Units	1,804
Student Engagement with Units on SDG 8	38,559

Research

Building Age-Friendly Workplaces for Mid- to Older-Age Employees

Professor Kuo-Yang Kao of the Department of Management Science leads the Lab of Occupational Health and Safety (LOHAS) in collaboration with Global-wafers' Zhongde branch, delivering strong results through studies on arch-support insoles and sleeping quality improvement for operators, along with a job redesign initiative. The project received the Ministry of Labor's 2024 "Excellence Award for Employment of the Mature Workforce," and has been showcased at multiple industry and government academia exchanges as a benchmark case. The team helped the company embed age-friendly workplace and talent sustainability principles into policies and performance reviews, rolling out measures such as flexible scheduling, health management programs, education and on-the-job training, and crisis management planning. These actions consider employees' physiological status, physical load, and work–life balance, thereby lowering occupational injury risk, reducing stress, and fostering a diverse and inclusive work environment.

Upgrading the Workforce through Technology Talent Development

NYCU Lightmed Laser System Research Center, working closely with the Taoyuan–Hsinchu–Miaoli Branch of the Workforce Development Agency, participates in multiple talent programs, including Industry New Vanguard, the Semiconductor Industry Professional Talent Development Base, and the Semiconductor & Key Technologies Talent Development Base. These initiatives address talent shortages in high-tech sectors while enhancing workforce quality and employability in the sector. In 2024, the Center received the National Talent Development Award — Outstanding Case Award, recognizing its exceptional achievements in cultivating technological talent.

Social Impact

Unlocking New Opportunities for Sustainable Development among Global Taiwanese Businesses

NYCU's Taiwan Business Center co-hosted the 2024 Summit on New Trends of Taiwanese Enterprise Globalization with the World Taiwanese Chambers of Commerce, drawing over 200 participants. In addition to attendees from Taiwan, the summit welcomed representatives from Mainland China, Japan, Vietnam, Singapore, Malaysia, Thailand, Uganda, North America, Sweden, Australia, and New Zealand, underscoring the community's extensive international network and influence. The discussions centered on three core themes: new strategies in economic diplomacy, emerging industry trends, and global operating strategies for Taiwanese enterprises. Through forums and exchanges, participants explored how to drive digital innovation and sustainable operations amid rapid global changes, leveraging academic insights to strengthen industrial strategy.

Open House: Campus Recruitment on a National Scale

NYCU's OPEN HOUSE is Taiwan's largest campus recruitment program, held every spring and fall. In addition to job fairs, it features company information sessions, corporate site visits, and one-on-one mentoring with industry professionals, helping students clarify career paths while enabling employers to recruit top talent. The Fall 2024 Job Fair brought together 70 companies, giving students direct access to hiring managers to learn about industry trends, workplace culture, and role requirements. These face-to-face interactions help students plan concrete career steps while allowing companies to identify high-potential candidates.

Education & Cultivation

Linking New Career Opportunities in the Southern Taiwan Science Park

To help students seize opportunities in southern Taiwan's high-tech sector, the National Science and Technology Council's Southern Taiwan Science Park Bureau, the Tainan City Labor Affairs Bureau, and NYCU again joined forces in 2024 to host the forum "Chasing Dreams in STSP—Northern Youth 'Going South' (Part II)." The event brought leading STSP companies to northern Taiwan for on-site recruitment, and built a direct bridge between talent and the industry. A career coach from a major job bank delivered a "job-search essentials" session, and HR specialists from Novatek, AEMC, and KLA shared interview strategies and, from a coaching perspective, unpacked what employers look for—helping students sharpen their competitiveness.

Strengthening Awareness of Labor Rights and Workplace Safety

In 2024, the University ran a series of education sessions on labor rights and workplace safety, including "A Panorama of Labor Rights" and "Operation: Safeguard Your Labor Rights." Expert instructors explained labor regulations, how to handle labor–management disputes, and the rights that student workers should know, enabling students to navigate workplace rules and protect themselves. Complementing these talks, the Workplace Unlawful Infringement Prevention Program invited legal experts to use real cases to discuss how to identify and address bullying, discrimination, and inappropriate treatment at the workplace. Together, these programs build practical knowledge of labor law and foster a culture of safety and dignity in the workplace.

Stewardship

Reliable Childcare to Strengthen Workforce Stability

In October 2024, the NYCU Affiliated Hospital officially opened an on-site infant daycare center for employees' children aged 0–2 years, providing a safe, high-quality childcare option that meaningfully supports healthcare professionals and their families. This family friendly measure enables staff to balance caregiving and careers, easing the transition back to work and enhancing the hospital's competitiveness in recruiting and retaining medical personnel, which are hallmarks of a responsible, top-tier employer. The center features well-equipped activity rooms, a lactation room, a kitchen, and an electronic home–school communication system. The caregiver-to-child ratio is maintained at 1:4, exceeding legal requirements to ensure attentive and individualized care. Fees are aligned with those of public childcare centers, thereby reducing the financial burden on employees' families.

Workplace Sexual Harassment Prevention Measures

Our school upholds the principles of gender equality and a friendly workplace. In accordance with the Gender Equality in the Workplace Act and relevant regulations issued by the Ministry of Labor, we have formulated and publicly announced a "Statement Prohibiting Sexual Harassment in the Workplace." All faculty, staff, temporary personnel, and visitors on campus are expected to work together to maintain a work environment that is free from sexual harassment. Our school clearly establishes the following principles:

- Zero tolerance. Any form of sexual harassment is strictly prohibited, including words, behavior, or insinuations with sexual content or gender bias, as well as improper requests made by leveraging workplace relationships that impair another person's job performance or dignity.
- Reporting and support. Faculty, staff, or students who experience or suspect sexual harassment may report immediately to the Personnel Office or the Campus Security Center. The University will accept the complaint and initiate an investigation in accordance with the regulations.
- Protection and confidentiality. Complainants and those who assist them are protected from retaliation. All investigative procedures are conducted with strict confidentiality.
- Education and prevention. The University regularly conducts training on gender equality and workplace sexual harassment prevention. Participation of all faculty and staff is required to strengthen awareness and response capabilities.

09

INDUSTRY, INNOVATION AND INFRASTRUCTURE

2020-2024 Publications	629
2020-2024 Percentage of all Taiwan Publications	6.2%
Course Units	1,528
Student Engagement with Units on SDG 9	30,652

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.1

Research

Breakthroughs Laying the Groundwork for Taiwan's Aerospace Development

At 6:06 a.m. on July 21, 2024, NYCU's Aerospace Systems & Aerodynamics Research (ASARe) Lab successfully completed the maiden test flight (Launch-1) of the Asfaloth sounding rocket at the Xuhai Scientific Rocket Range, Pingtung, a major milestone on the University's path toward space exploration. The mission debuted the "Viper–Eagle" hybrid rocket engine, showcasing innovative propulsion capabilities and establishing a critical foundation for upcoming tests of higher-performance two-stage rockets. Beyond the flight itself, the result marks a significant leap in systems integration, aeronautical engineering, and propulsion technology across collaborating laboratories, and opens up new opportunities for Taiwan's space initiatives and indigenous aerospace R&D.

Innovation and Applications in Anti-Counterfeiting Technology

Assistant Professor Yao-Wei Huang (Department of Photonics) and his team have developed a narrowband high-Q metasurface platform that dramatically enhances the color purity and security of anti-counterfeit labels. Using topology-optimized inverse design, the group realized a metasurface with a quality factor (Q) of 1,362, delivering up to a 15× efficiency improvement over conventional approaches and achieving an experimental efficiency of 59%, which is a notable breakthrough in the field of nonlocal metasurfaces. The work was published in Nano Letters and was featured as a cover article, drawing significant attention from both academia and industry sectors.

Social Impact

Accelerating the Internationalization of Taiwan's Startups

NYCU's Industry Accelerator & Patent Strategy Center (IAPS) signed an MoU with DEKRA, a global leader in testing and certification, to provide startups with a one-stop pathway from product testing and inspection to international certification. Having already supported over 1,000 startups and R&D teams, the IAPS will leverage DEKRA's capabilities to lower market-entry barriers, shorten time-to-market, and boost global competitiveness.

Open-Source 5G Core Powering Global Innovation

Developed by Professor Jyh-Cheng Chen, Dean of the College of Computer Science, free5GC is the world's first fully standards-compliant open-source 5G core network software. On September 16, 2024, at the Open Source Summit Europe, free5GC was officially onboarded to the Linux Foundation open-source ecosystem—an international milestone that strengthens open development in core networks and lays the groundwork for future 6G technologies.

Education & Cultivation

Cross-Disciplinary Learning that Ignites Innovation

NYCU's ICT Co-Working Space pairs hands-on, cross-disciplinary courses with university-wide maker spaces to provide students with a platform for experimentation and co-creation. The 2024 ICT Open LABs Showcase, themed "Intelligence Leading the Trend," presented outcomes from seven focus areas—digital manufacturing, AR/VR, IoT, drones, robotics, biomed/health, and new media creation—with over 100 projects on display. The exhibition also featured interactive experiences, including laser engraving, 3D printing, and VR explorations. By integrating coursework, exhibitions, and try-it-yourself activities, the program cultivates students' cross-domain creativity alongside practical making and problem-solving skills, advancing a vibrant campus culture of innovation.

Building a Campus Entrepreneurship Value Chain

The NYCU Innovation & Entrepreneurship Club is a student academic organization dedicated to creating an on-campus startup community and serving as a bridge between students and the industry. Centered on strengthening entrepreneurial capability, the club encourages participation in creativity and start-up competitions, and helps its members expand their professional networks and resources. Its hallmark is a full "from 0→1" execution chain, from pain-point discovery, user interviews, and product validation to business plan writing and pitch demo training. The club also organizes company visits and internships to reinforce a sustainable campus startup ecosystem.

Education & Cultivation

Co-Creating an Innovation Ecosystem across Industry, Government, and Academia

At InnoVEX 2024, NYCU curated the NYCU Pavilion to showcase the university's growing portfolio of startup technologies by integrating multiple in-house incubation resources. The pavilion, curated by several accelerators, includes the ESG Accelerator, a collaboration with the Ennoconn Group, the International Sports Technology Startup Accelerator, a partnership with the Ministry of Education's Sports Administration, and the university's Innovation and Entrepreneurship Center, which focuses on cultivating spin-off companies. The pavilion showcases a model of innovation and incubation fostered through a trilateral partnership between industry, government, and academia. The exhibits spanned areas such as information and communications technology, artificial intelligence (AIoT), green technology, and sports technology, demonstrating the university's strength in cross-disciplinary R&D and startup incubation.

Building a One-Stop Startup Support Platform

NYCU's Innovation and Entrepreneurship Center drives a campus-wide startup ecosystem through structured support, competitions, and purpose-built incubation spaces, accelerating technology translation and new-venture growth. The Center offers a full suite of resources for faculty and student founders: training courses, events, and talks; hands-on support for business plan development covering market discovery, technology valuation, technology transfer, go-to-market strategy, fundraising, and product/service validation. Regular innovation and entrepreneurship competitions cultivate creative thinking and technology commercialization skills, unlocking campus ventures. With dedicated incubation sites, the Center actively recruits high-quality teams, connects them to NYCU's industry–academia resources, and supports their market expansion and internationalization.

Transforming the Boai Campus into a BioICT Powerhouse

NYCU is reimagining its Hsinchu Boai Campus as a national BioICT hub, centered on biomedicine, AI, and semiconductors. In 2024, the University established the College of Engineering Biosciences (one department, two institutes, and three programs). Building on the campus's legacy as the cradle of Taiwan's semiconductor industry, the site is being repositioned as a base for engineering biology and smart healthcare, integrating molecular biology, ICT, and biomedical engineering to advance precision medicine, translational engineering, and sustainable technology. Current investments include intelligent diagnostic chips that combine generative AI with semiconductor design to speed up screening for sepsis and stroke, along with R&D on decarbonization and net-zero solutions. The College is linking the Center for Engineering Medicine with Chuming Hospital to create industry–academia–clinical collaborations and real-world clinical testbeds. By strengthening critical infrastructure and innovation capacity, the Boai Campus is positioned as a national nexus for BioICT development.

10

REDUCE INEQUALITIES

2020-2024 Publications	110
2020-2024 Percentage of all Taiwan Publications	6.2%
Course Units	117
Student Engagement with Units on SDG 10	3,329

Research

Ethnic Communication Should be Based on Diversity.

Amid the rapid expansion of the semiconductor industry and dramatic changes in land and ethnic structures, Hakka issues have become a national social issue in Taiwan. The 20th anniversary academic symposium of the College of Hakka Studies at our University, themed "Ethnicity, Culture, and Communication," explored the opportunities, challenges, and possibilities of ethnic communication. The symposium focused on topics such as Hsinchu's local history, ethnic culture, and interaction between the technology industry and the local society. The symposium highlighted the long-standing limitations of Hakka communication within a top-down framework, and called for the reconstruction of communication models from a multicultural perspective. The school also showcased innovative technologies such as AI Hakka applications and the Metaverse as tools for promoting language revitalization, bridging information gaps, and expanding participation. These technologies further promote inclusive governance and cultural rights, and contribute to the sustainable goals of reducing inequality and building resilient communities.

Reading Inequality and Cultural Translation through Women's Cinema

NYCU's International Center for Cultural Studies hosted the series "Lee Mi-mi Film Lectures: Women's Cinema, New Intimacies, and Social Subjectivity," featuring director Li Mi-mi alongside festival curators and scholars. Revisiting Evening News, Unwed Mother, and Girls' School, the program approached these films through feminist and queer lenses to probe women's circumstances in 1980s Taiwan, question the heteronormative marriage system, and consider "non-binary" forms of peer intimacy. Speakers also examined how censorship regimes and social realism conventions constrained representations of marginalized groups. Centered on "voices overlooked by history," the series aimed to broaden access to cultural resources and to increase the visibility of diverse subjectivities.

10 REDUCE INEQUALITIES

Social Impact

Advancing Social Participation for People with Disabilities

NYCU partnered with the Hsinchu Saint Joseph Social Welfare Foundation to host the “Double Happiness: Disability Services & Eco Charity Fair,” expanding social support through intergenerational, cross-sector participation. Performances featured kindergarten dance troupes, active-aging fitness showcases, Angels of Mercy Percussion Ensemble, and NYCU’s Best Saxophone Band, fostering a positive public perception of the abilities of persons with disabilities. On site, 82 food and charity booths, government information stations, and a sheltered workshop DIY zone used checkpoint games to promote service concepts; all proceeds from charity sales were devoted to care funding. Dean Hui-Min Chung of the College of Management donated NT$655,000, and additional contributions from alumni and corporate partners strengthened resource mobilization and the local support network.

“Friendly Hoops” for Sports Equity

NYCU hosted the first event of the Friendly Hoops initiative in collaboration with the Chinese Taipei Paralympic Committee, Hsing Wu University of Science and Technology, and the He-One Mission Association. U.S. one-armed basketball player Kevin Atlas and NCAA athletes visited the campus for a friendly game, meet-and-greet, and talk advocating a governance principle of “one friendly hoop for every six.” The goal is to ensure priority and safe access to courts for people with disabilities and other underserved groups. Combining international exchange with on-campus implementation—through signage, priority-use mechanisms, and awareness education—the initiative lowers participation barriers, addresses experiences of exclusion, expands access to sports resources and opportunities, and fosters an inclusive environment in which everyone can enjoy physical activity.

10 REDUCE INEQUALITIES

Education & Cultivation

Advancing Educational Equity through English Tutoring and Digital Guidance

The Department of Foreign Languages and Literature has long supported Hulin Elementary School (Xiangshan, Hsinchu) through service learning, which shifted seamlessly online during the pandemic. Tutors visit the school every Wednesday to provide English support that builds pupils' confidence, motivation, and awareness of future study opportunities. With backing from the TSMC Charity Foundation and Syntec Foundation, resources have continued to expand. The program, in collaboration with the UMC St. Heart After-School Tutoring Center, also provides vibrant and varied after-school learning opportunities for economically disadvantaged students. In parallel, the "Outskirts, Not Outsiders" digital platform presents admissions information and program highlights in clear, accessible formats to high school students across Taiwan, narrowing urban–rural and information gaps and improving access to opportunities for rural students.

Landing a Semiconductor Gateway Course in Island High Schools

NYCU's Research Center of Higher Educational Resources for Openness delivered an on-site course, "Introduction to Semiconductor Principles and Manufacturing," at Nangan, Matsu, using mobile teaching to address resource disparities and establish a long-term pipeline for cultivating local technology talent. Co-designed by Associate Director Ken-Zen Chen and Professor Wei-I Lee, the course employs a dual-track approach—digital materials plus industry practice—covering quantum concepts, semiconductor processes, and the industrial context of Taiwan. Comprehensive teaching videos, handouts, and platform support enable rural and island schools to offer forward-looking, elective courses. In its first rollout, the course was adopted by 44 high schools nationwide, with Matsu's students showing high engagement and strong performance.

Stewardship

Accessible Support and Inclusive Services

In accordance with the Ministry of Education's "Guidelines for Subsidizing Universities to Admit and Support Students with Disabilities," NYCU has established Resource Centers on both the Yang Ming and Chiao Tung campuses. Serving enrolled students who hold official MOE disability certification, as well as those recommended for school placement, the centers provide one-stop services covering academic support, daily living adaptation, career transition, and psychological counseling. They also offer a range of individualized guidance programs and campus-wide outreach to promote inclusion and mitigate the impact of disability. By fostering a barrier-free, accessible, and highly participatory learning environment, the University helps students realize their potential and contribute to society.

Establishing a Kaohsiung Division to Power Southern Taiwan's Innovation

To align with Kaohsiung's growing semiconductor ecosystem, NYCU is establishing a Kaohsiung division focused on semiconductors, AI, and ESG, with master's and doctoral admissions starting in 2025. The Kaohsiung City Government has designated the Liantan Guest House as the campus site, conveniently located near the HSR, TSMC, and Nanzih Industrial Park—an ideal setting for industry–academia collaboration and hands-on field projects. Leveraging alumni and corporate networks, the division will launch an Industry–Academia Talent Academy and a Joint R&D Center, drawing on the successful Hsinchu Science Park model to accelerate R&D translation and enhance industrial sustainability. This initiative will expand access to graduate education in southern Taiwan and strengthen the region's innovation capacity.

11

SUSTAINABLE CITIES AND COMMUNITIES

2020-2024 Publications	298
2020-2024 Percentage of all Taiwan Publications	6.2%
Course Units	547
Student Engagement with Units on SDG 11	12,040

Research

Data Governance and Civic Participation for Smart Cities

Amid the rapid expansion of AI and smart city initiatives, Associate Professor Sung-Yueh Perng from the Institute of Science, Technology and Society noted that many so-called bottom-up processes are still led by technical or commercial actors. Biased data and high participation thresholds can distort how algorithms "see" cities. To build inclusive and resilient cities, he proposes a three-pronged approach: data governance, public participation, and policy co-creation. In terms of data governance: introduce representativeness and bias checks, de-identification with clear purpose limitations, and algorithm audits with public-facing explanations. In terms of participation: reduce barriers through plain-language information, data-literacy empowerment, and accessible multilingual interfaces; and amplify diverse voices via citizen juries and co-design workshops. In terms of policy collaboration: adopt AI impact assessments and enable tripartite collaboration among citizens, experts, and the civil service so that proposals translate into actionable projects. This pathway keeps technology human-centered and prevents data bias from misrepresenting the urban reality.

We All Live in a Spatial Database

Assistant Professor Tien Ling from the Graduate Institute of Architecture blends GIS, spatial interpretation, and media art through courses, workshops, and creative practice, translating Taichung's urban flows, Hsinchu's spatial data, Taoyuan's pond landscapes, HSR-driven transformations, and K–12 environmental observations into readable "spatial databases." The exhibition at the Hao-Ran Library Arts & Culture Center showcases the following: on the first floor, the Taichung Project series, including the National Taichung Theater interactive projection Your City Colors and the MOE Aesthetic & Design Curriculum Innovation project Selfie Mosaic; on the second floor, Hsinchu Tapestry, Pond Catalogue, and HSR-themed Island Acceleration and High-Speed Relations, which probe landscape change and shifting perception under high-speed mobility. Previously shown in Venice and Ulaanbaatar, these works debuted in Hsinchu to cultivate spatial literacy and local sensibility, strengthen identification with urban landscapes and cultural contexts, and advance public participation and cultural preservation.

11 SUSTAINABLE CITIES AND COMMUNITIES

Social Impact

Transforming the Campus into a Low-Carbon Mobility Hub

On December 13, 2024, Hsinchu City launched an all-electric pilot bus service featuring the first direct route to the Science Park, linking the Hsinchu Railway Station, National Tsing Hua University, NYCU, the HSR Station, and the Biomedical Science Park. Within NYCU, six stops—Zhuhu Guest House, Gymnasium, Engineering Building VI, General Building I, Activity Center, and Zhuhu—have significantly improved commuting convenience for students, faculty, and researchers. Positioning the campus as a key node connecting the park–city–campus, the project dovetails with the planned Greater Hsinchu Light Rail Red Line to build a diversified, multimodal transport system. The initiative reduces private car dependence and carbon emissions, advancing the vision of smart mobility and a low-carbon city.

Intergenerational Learning for an Inclusive Community

On July 31, 2024, NYCU's USR team and the TSMC Charity Foundation co-hosted "Youth–Senior AI Learning: Care Without Ceasing" at the Xiangshan Community Development Association (Hsinchu City). Working with 20 older adults from Dazhuang and 22 pupils from Dazhuang Elementary School, NYCU students designed Edge-AI rhythm-and-movement activities to spark cross-generational interactions. In partnership with the Chang Gung Memorial Hospital, the program integrated digital tools into health screening and monitoring. Supply chain corporate volunteers also joined to broaden the community support network. The initiative strengthens co-participation, improves digital and health literacy among seniors, and establishes a sustainable, inclusive learning space within the community.

Education & Cultivation

Industry–Academia Collaboration for Better Public Works

NYCU signed an MoU with CECI Engineering Consultants, Inc., Taiwan, focusing on civil engineering, MEP, smart transportation, traffic engineering, AI, and IoT. Through joint research, internships, and talent co-development, the partnership will accelerate technology transfer from the lab to the field, raising the quality, efficiency, and safety of public construction. CECI Engineering Consultants, Inc., Taiwan, has long participated in major national projects and has received numerous professional awards. Currently, approximately 7% of its employees are school alumni. This deepening collaboration will expand the industry-university cycle, improve occupational safety and workplace-friendly systems, inject a stable supply of talent and technological momentum into national infrastructure, and promote the upgrading of urban and transportation systems with intelligence, resilience, and a low-carbon approach.

6G Applications for Resilient, Sustainable Cities

NYCU hosted the symposium “Toward Sustainable Smart Cities: Vertical Applications of 6G,” convening leaders from industry, government, academia, and research to examine 6G’s key use cases and social impacts across transportation, energy, public safety, and urban governance. The program emphasizes open architectures, standards development (including O-RAN), and ICT security as critical enablers. On the same day, the B5G Open-Architecture Mobile Network Workshop turned the NYCU campus into a hands-on living lab for instruction and demonstrations, helping the participating organizations to ramp up and validate solutions quickly. Through talks, workshops, and real-world testbeds, the initiative is building a co-creation platform for 6G applications—advancing interoperability, ecosystem partnerships, and cyber resilience—and strengthening the low-latency connectivity, energy-efficient computing, and real-time data services required for sustainable, resilient cities.

Stewardship

Car-Free Day Kickstarts a Low-Carbon Campus

The University marked Earth Day (April 22) with a Car-Free Campus Day. The president and senior administrators led by example by walking to work, reinforcing campus-wide awareness and action regarding climate change. In parallel, the University launched a campus-wide carbon inventory to anchor future reduction targets and governance pathways. To reduce motorized dependence on the hilly Yang Ming campus, recent measures have included YouBike stations, car-sharing, and an inner-campus shuttle. On the Chiao Tung campus, with alumni support, the University introduced electric scooters and upgraded to smart, energy-saving streetlights, balancing mobility and convenience with efficient energy use. Advancing along three axes—behavior change, modal shift, and energy management—the university is building a low-carbon, mobility-friendly campus and strengthening its connection to a sustainable city.

Building Sustainable, Resilient Campus Housing

To enhance the student living quality and overall campus experience, NYCU launched a comprehensive renewal of Student Dormitory 11 in 2021. By preserving the dormitory's original function, the project pursued a full-building upgrade rather than piecemeal repairs as a flagship model for future residence renovations. The contract was awarded in April 2023, construction began immediately, and the revamped facility was completed in July 2024. The project closes the longstanding gaps created by earlier construction eras, changing environmental conditions, and shifts in the education system. The design progressed along three axes: first, the reorganization of the site framework to reassess massing, circulation, and program layout, improving both living quality and operational efficiency; second, the expansion of shared public landscapes to strengthen open, communal spaces and cultivate a more interactive residential community; and third, tighter integration with campus life so that everyday dorm routines connect seamlessly to learning, activity routes, and student services. Together, these strategies deliver a sustainable and resilient residence that better serves today's students while setting a new standard for campus housing.

12

RESPONSIBLE CONSUMPTION AND PRODUCTION

2020-2024 Publications	116
2020-2024 Percentage of all Taiwan Publications	2.8%
Course Units	531
Student Engagement with Units on SDG 12	11,20

Research

New Materials for Sustainable Fashion

A research team led by Distinguished Professor Jiun-Tai Chen from the Department of Applied Chemistry has developed a self-repairing ion gel that rapidly repairs damage and restores its structure and function under specific pressing conditions. The technology, titled “Repairable substrate, preparation method thereof and repair method,” was granted a Taiwan invention patent in January 2025 and shows strong commercialization potential for smart apparel, medical dressings, and wearables. By extending product lifetimes, the material lowers replacement frequency and raw material use, reduces maintenance costs and carbon emissions, and advances circular design and life-cycle management while strengthening industry–academia linkages in high-value materials.

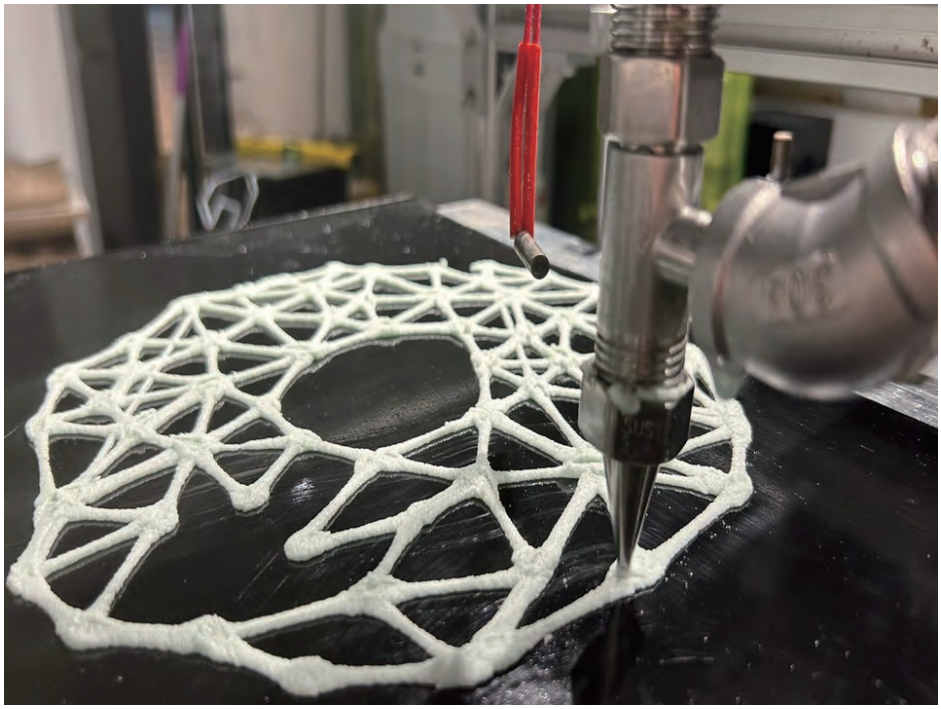
Upcycling Medical Waste into Wearable Health Tech

Addressing post-pandemic medical waste such as disposable masks, Assistant Professor Min-Hsuan Lee from the Institute of Environmental Engineering and his team proposed a “two birds with one stone” strategy. They recovered polypropylene (PP) from used masks and paired it with multi-walled carbon nanotube (MWCNT) conductive ink using a dip-coating process to fabricate flexible, wearable ECG electrodes. The electrodes deliver high conductivity, excellent stretch and bend tolerance, and stable signal output, and they can be integrated directly with commercial ECG devices for high-quality monitoring. This approach reduces the environmental burden of incineration and landfilling, and opens new pathways for e-textiles and digital health materials. The results were published in the journal, Sustainable Materials and Technologies.

Social Impact

Turning Discarded Fish Scales into Crafted Artworks

Confronting Taiwan's approximately 190,000 tons of annual seafood waste, as well as the challenge of small, malodorous, hard-to-recycle fish scales, Assistant Professor Jian-You Li of the Institute of Applied Arts launched a project called ReuScale (循鱗). The project purifies recovered scales through low-cost processes and, via 3D printing, transforms them into aesthetically refined, functional pieces, creating second-life value while easing disposal burdens. With roughly 90% of fish scales still landfilled, the project demonstrates a reduce–reuse–redesign circular pathway, builds local collection channels with communities, fishing ports, and processors, and pilots place-based collaboration models. Recognized by the Taiwan Sustainability Action Award and the Asia-Pacific Sustainability Action Award, ReuScale has begun material exchange work with Japanese research partners, and has been integrated into campus digital-fabrication courses and workshops to deepen awareness of waste issues and responsible consumption.



DIYGreen: A Zero-Waste, Circular Urban Farm System

Professor Jehng-Jung Kao and his team advance responsible consumption and production through the DIYGreen urban-farming system. Using recycled PET bottles as water reservoirs with capillary micro-irrigation, the system reduces water use and upkeep (small bottles supply water for 7–14 days, and large bottles supply water for over a month), and improves building thermal comfort (approximately 2–4 °C cooling). After 21 design iterations and over a decade of stable operation, the team plans to conduct a negative carbon accounting audit in 2025. On the circular end, chickens, earthworms, and black soldier flies upcycle kitchen scraps into organic fertilizer, closing the loop from resource to product to regeneration. Modular by design, DIYGreen has scaled to over 200 schools and enterprises across Taiwan, and is now paired with semi-transparent PV and service-learning deployments to broaden its cross-disciplinary impact.

Building Circular Water Resilience

NYCU's Environmental Technology and Smart Systems Research Center (ETSS), in partnership with the Water Resources Agency, is advancing a "desalination brine valorization" program. The team has built a continuously operated brine-to-resource module that uses a suite of advanced processes to extract value-added elements and chemicals from desalinated brine. This approach turns a by-product into a sustainable resource, meets domestic market needs, reduces dependence on imports and transport emissions, and strengthens circular economy practices and local supply chain resilience.

Education & Cultivation

Earth Day Woodcraft: From Knowledge to Habit

For Earth Day, NYCU hosted “Exploring the Value of Reclaimed Wood, Practicing Sustainable Living”—a three-part program featuring a talk on wood vinegar, circular-economy case shares, and a reclaimed-wood hands-on class. The activity started with the wood recycling process and the application of recycled materials, explaining the impact of consumer choices on the carbon footprint of the environment. By creating small objects, participants were able to experience the re-valuation of recycled materials with their own hands, turning sustainability from knowledge into action habits, strengthening sustainability literacy in schools, and encouraging the extension of circular concepts to families and communities.

Cutting Plastics in Campus Dining

NYCU is advancing green dining and plastic reduction along four tracks: source reduction, reuse, education, and community engagement. Student cafeterias have eliminated disposable tableware and plastic bags, encouraging dine-in or bring-your-own containers with discounts to build lasting habits. A pilot reusable lunchbox program was implemented for meetings and training sessions, where vendors collected, washed, and redeployed boxes to boost resource efficiency. Talks on low-carbon dining and green food services promote zero-waste practices and local organic choices, and offices are encouraged to order from vendors offering reusable containers. In partnership with Hsinchu City’s “Green Cup” campaign, incentives increase the share of faculty, staff, and students who bring their food and drink containers.

Stewardship

Green Procurement & Green Office

Procurement prioritizes eco-labelled, reusable, low-pollution, and energy-saving products. Green office measures include saving electricity, paper, and water; double-sided printing and paperless meetings; video conferencing to reduce travel; reducing single-use items; stronger waste sorting and recycling; and preference for green venues and public transport. NYCU has achieved 100% compliance for three consecutive years in the government's "Green Procurement & Green Office" assessments, reflecting consistent results. Aligned with the Ministry of Environment's Net-Zero Green Living initiatives, green purchasing and green office practices are embedded in daily routines.

Waste Management & Resource Reuse

Our school promotes resource recycling based on the principles of on-campus recycling and cross-departmental sharing of resources. We have established a "Used Property Listing Area," where various units list information on equipment, desks and chairs, laboratory equipment, air conditioners, vehicles, and other items that are being replaced or scrapped for reuse within the school. This extends the lifecycle of items and reduces the need for new purchases. Materials that are still reusable are publicly available on government platforms to expand cross-departmental and social welfare group reuse. On the waste side, we implement source sorting and diversion management, separating general waste from recyclables. We monitor data through weighing and removal records, regularly reviewing resource utilization rates and reduction trends as a basis for procurement and site improvements.

13

CLIMATE ACTION

2020-2024 Publications	176
2020-2024 Percentage of all Taiwan Publications	4.2%
Course Units	78
Student Engagement with Units on SDG 13	2,045

Research

Breakthrough in Negative-Carbon Technologies

An international team led by Associate Professor Sung-Fu Hung from the Department of Applied Chemistry, working with scholars in Hong Kong and New Zealand, developed a triazole-based organic small-molecule catalyst that boosts both the efficiency and stability of the converting of dioxide to methane. Compared with conventional, high-cost metal catalysts, organic approaches are more affordable and use readily available materials. The team overcame the long-standing limitations of efficiency and durability of organic catalysts, opening a practical pathway for carbon capture and utilization. This advance reduces dependence on expensive metals, improves material accessibility, and substantially raises the prospects for real-world deployment. The findings were published in the journal, Nature Energy.

Frontier Research in Decarbonization and Energy Storage

Associate Professor Liang-Yi Lin of the Institute of Environmental Engineering and Associate Professor Yu-Sheng Su from the International College of Semiconductor Technology have advanced scientific solutions to climate change and energy transition. Both scholars received the 2025 Wu Ta-You Memorial Award from Taiwan's National Science and Technology Council (NSTC), highlighting the NYCU's excellence in sustainability research. Prof. Lin focuses on greenhouse gas mitigation and low-carbon air pollution control, integrating renewable energy and sustainable materials to deliver end-to-end strategies that span emission inventories, abatement, resource circularity, and governance performance assessment. His work strengthens pollution control, improves energy efficiency, and supports net-zero pathway planning. Prof. Su combines battery-material design, interfacial engineering, and semiconductor processing to develop high-energy-density storage systems, including silicon-based anodes, lithium metal, and lithium–sulfur batteries. His research targets both high power and safety, providing key technologies for clean energy deployment and grid dispatch.

13 CLIMATE ACTION

Disaster Adaptation and Social Resilience

NYCU's College of Nursing, in partnership with Taiwan's National Science and Technology Center for Disaster Reduction, conducted a 10-year longitudinal study of 1,236 households whose homes were severely damaged by Typhoon Morakot. Families who moved rapidly into permanent housing experienced lower stress in the short term but rising stress over time, with no long-term psychological advantage. In contrast, those who did not relocate immediately and had a longer period for preparation and adjustment, including one or more transitional placements, showed significantly better long-term psychological recovery. The study implies that post-disaster governance should incorporate phased resettlement, adequate decision and preparation windows, and systematic psychosocial support with resource linkage to strengthen social resilience and improve survivors' long-term mental and physical health. The results were published in the journal, Psychological Science.

Social Impact

ESG Net-Zero Strategy Manager Program

To meet the global 2050 net-zero goals and corporate decarbonization needs, NYCU's Center for Taiwanese Enterprise Study (TES) launched the ESG Net-Zero Strategy Manager Program in 2024. Taught by a cross-disciplinary faculty with a hands-on focus, the curriculum covers the foundations and practice of ESG and net-zero strategies, including carbon accounting, carbon management, the circular economy, and green energy technologies. The program integrates case exercises and tool-based practicums, and offers value-adding certification support that prepares participants for the MOEA iPAS "Net-Zero Carbon Planning Manager" and the III "ESG Net-Zero Strategy Manager" credentials. Target learners include chief sustainability officers, members of corporate sustainability committees, net-zero reserve managers, certification seekers, and EMBA students, with the goal of systematically strengthening organizational net-zero capability, advancing climate action, and enhancing international competitiveness.

Industry–Academia Alliance to Accelerate the Net-Zero Transition

NYCU and Ennoconn established the Ennoconn–NYCU ESG Net-Zero Transformation and Innovation Research Center, which focuses on AIoT and Ennoconn Solution as a Service (ESaaS). The center links industry, academia, research, and startups to deliver system-level solutions for smart manufacturing, smart cities, energy savings, and carbon reduction. By 2024, it had helped 13 AIoT net-zero startups join the ESaaS ecosystem alliance, enabling software–hardware integration and modular deployment across sites, while speeding international market entry. On the talent side, the center co-hosted career talks with Ennoconn subsidiary eCare Cloud and the Niche Women in Tech team, introducing digital twin applications and green-collar skill development; nearly one-third of student attendees expressed internship interest, expanding the industry talent pipeline. Looking ahead, the center will combine NYCU's frontier research with Ennoconn's strengths in aerospace satellites, smart factories, and semiconductors to deepen collaboration, drive patent and technology transfer, accelerate decarbonization governance, and scale solutions for global markets.

13 CLIMATE ACTION

Education & Cultivation

Net-Zero Emissions Micro-Credential

Our school offers a "Micro Program on Net Zero Emissions," which is a systematic curriculum that emphasizes both theory and practice. It covers topics such as climate change science, corporate carbon inventory and emissions accounting, carbon management and reduction strategies, circular economy design, and green energy technology. It emphasizes case studies, practical projects, and cross-domain collaboration, cultivating students' practical skills in everything from data collection and inventory modeling to carbon reduction path planning and results tracking. Students are guided to implement resource circularity and decarbonization in everyday and workplace settings. The program also aligns with professional certifications, such as the MOEA iPAS Junior Net-Zero Planning Manager, addressing talent needs for Taiwan's 2050 net-zero policy and corporate transitions, and cultivating a new generation with a systems vision and execution capability.

Net-Zero and Sustainability Knowledge Series

In 2024, NYCU hosted a series of talks and themed activities to strengthen climate literacy, carbon governance skills, and local decarbonization action among faculty, staff, and students, thereby boosting campus momentum and environmental resilience, and advancing sustainable campus governance. Highlights included:

- Dr. Omar M. Yaghi (Tang Prize Laureate in Sustainable Development): Advances in sustainable technologies, focusing on metal–organic and related framework materials.
- Dr. Gunter Pauli (Blue Economy advocate): Blue innovation for net zero.
- Patrick Chu (CEO, OrgBetter): Practical carbon inventory, carbon footprint, and energy management.
- Assistant Prof. Chung-Pei Pien (NCCU International College of Innovation): Taiwan's decarbonization performance and challenges viewed through postwar economic development and firm characteristics.

Education & Cultivation

Laying the Foundation for Carbon-Emission Management

In 2024, NYCU obtained its first third-party external verification statement for the University's greenhouse gas inventory—a major milestone in institutionalizing campus GHG management. Led by the Office of General Affairs and the Environmental Protection & Safety & Health Center, the inventory followed the ISO 14064:2018 standard and systematically mapped all campus emission sources, including both direct and indirect emissions, to establish a complete baseline. The calendar year 2023 served as NYCU's first full, campus-wide inventory, and has been designated as the base year for future performance tracking and policy planning. To ensure transparency and credibility, NYCU engaged an independent, reputable verifier for external assurance, which improved inventory quality and aligned with international governance practices.

Leading Net-Zero Healthcare Through a Sector-Wide Pledge

In December 2024, NYCU joined the Ministry of Health and Welfare's Cross-Sector Sustainable Healthcare Alliance, and co-signed the Sustainability Initiative with the Ministry of Health and Welfare (MOHW), Ministry of Environment, Ministry of Economic Affairs (MOEA), Taiwan Institute for Sustainable Energy (TAISE), 26 MOHW hospitals, the Industrial Technology Research Institute (ITRI), and several universities. The pledge advances the integration of sustainability into hospital accreditation, whole-of-hospital greenhouse gas inventories, and seed-talent training. Hospital sustainability efforts are structured around four pillars: (1) sustainable environments and clinical decarbonization, (2) risk adaptation and resilient care, (3) healthy workplaces and social care, and (4) digital transformation and clinical excellence. This public-private collaboration accelerates the health sector's net-zero transition and strengthens disaster resilience, underscoring the leadership of universities in climate governance, knowledge translation, and healthcare decarbonization.

14

LIFE BELOW WATER

2020-2024 Publications	51
2020-2024 Percentage of all Taiwan Publications	2.3%
Course Units	47
Student Engagement with Units on SDG 14	970

Research

Reimagining the Seafloor with Satellite Observations

Professor Cheinway Huang from the Department of Civil Engineering and his team leveraged Surface Water and Ocean Topography (SWOT) satellite data, combining radar altimetry with marine gravity anomalies to develop a new inversion method for seafloor bathymetry. Published in Science and honored with a 2024 National Chair Professorship, this technique delivers wide-area, low-cost, and long-term continuous observations that markedly improve bathymetric reconstruction and ocean monitoring. The results support plate tectonic and trench system identification, nearshore hazard assessment, coastal flood modeling, and water resource planning. In terms of a sustainable ocean, this tool can also strengthen governance capabilities, such as marine ecological habitat inventory, fishery and protected area planning, navigation safety and maritime monitoring, and provide a key observation basis for the waters surrounding Taiwan and the global blue economy and climate resilience.

AI Tools for Underwater Acoustic Imaging

Professor Hong-Han Shuai from the Institute of Electrical and Computer Engineering and his group developed CMAF (Cross-Modal Augmentation via Fusion), an underwater acoustic-image recognition method reported in the ACM Transactions on Multimedia Computing, Communications and Applications. CMAF uses a dual-branch architecture that fuses visual imagery and sonar signals with attention-based integration, alongside masked training and focal loss, to significantly improve the accuracy and robustness in noisy, data-sparse underwater settings. The team has open-sourced the code to spur industry–academia collaboration and cross-domain applications. Use cases include long-term marine environmental monitoring, habitat and species identification, and systematic biodiversity data collection—delivering a key AI capability for marine governance and decision support.

14 LIFE BELOW WATER

Social Impact

Cross-Disciplinary Dialogue for Ocean Sustainability

Hosted by the Department of Humanities and Social Sciences, the international symposium, “Waters and Coastal Societies: Comparative and Cross-Disciplinary Perspectives,” brought together more than 20 scholars from over 10 institutions. Through talks on the environment and local communities, coastal fisheries and livelihoods under Japanese rule and in the postwar era, distant-water fisheries and local societies, and religion and place, the meeting examined environmental change and social impacts in the seas around Taiwan from historical, cultural, industrial, and governance viewpoints. Discussions focused on fisheries transition, nearshore ecological impacts, community resilience, and resource co-management, proposing concrete pathways that weave local knowledge with scientific monitoring, promote sustainable fishing and cultural landscape conservation, and strengthen civic participation and cross-sector governance. The dialogue not only advanced ocean education and public awareness, but also offered evidence and recommendations for coastal governance and policymaking.

Strengthening Ocean Monitoring and Rescue

JetSea AI, a spinout from NYCU, specializes in creating autonomous surface vehicles (USVs) and smart vessel control systems. These systems integrate panoramic vision, radar/LiDAR, AIS tracks, and sonar with AI-driven obstacle avoidance, deep reinforcement learning, and frequency-hopping communication. This combination allows for dependable data gathering and mission performance over extended distances and under challenging sea conditions. The platform accepts modular payloads, such as hydrophones, multibeam, and side-scan sonar, supporting marine environmental monitoring, maritime patrol, and emergency response, while improving pollution detection, habitat mapping, and navigational safety management. With a core team from NYCU and MIT, JetSea AI placed 3rd worldwide at RobotX 2022 and 7th in DARPA SubT, demonstrating world-class autonomy. This capability strengthens science-based decision-making and governance, advancing the conservation and sustainable use of ocean resources.

14 LIFE BELOW WATER

Social Impact

Engineering Practice for Marine Debris Governance

NYCU's ICT Co-Working Space offers a hands-on course on "Intelligent Waterborne Garbage Collection Vessel," integrating marine environmental concerns with engineering. Using problem-based learning, students start from real-world ocean-pollution scenarios and apply fluid mechanics, mechanism design, control programming, and mechatronics to build working prototype boats. The performance is validated through a "trash collection challenge" that evaluates the capture volume, handling stability, and energy use. The course deepens understanding of marine sustainability and social implementation while training students to turn ideas into verifiable engineering solutions and collaborative team practice—providing replicable designs and technical pathways for marine-debris mitigation.

Governing Multi-Species Fisheries Resources

NYCU's International Center for Cultural Studies (ICCS) invited Associate Professor Ting-Chun Kuo from National Taiwan Ocean University to speak on multi-species fisheries management. Challenging mainstream frameworks shaped by temperate ecologies and single high-value species, the talk proposed localized, context-aware governance for subtropical/tropical, high-diversity waters. The approach incorporates food-web interactions, gear differences, community livelihoods, and market structures to develop ecosystem-based management and community co-management. Echoing social-science perspectives on "decolonizing knowledge," the lecture advocated cross-disciplinary learning and policy collaboration to strengthen synergies among fisheries science, the humanities and social sciences, and on-the-ground governance.

Stewardship

Beach Cleanups to Safeguard the Ocean

NYCU's College of Management, together with student groups such as the Youth Volunteers Club, organized a series of beach cleanups spanning the Hsinchu coastline, Nanliao Fishing Harbor, and Taoyuan's Guanyin Algal Reef. These actions were paired with visits to environmental education centers and on-site briefings to deepen the understanding of marine-debris sources, habitat protection, and resource circularity. Participants removed plastics and other single-use waste to restore coastal environments and ecological functions, while plastic-reduction advocacy, sorting demonstrations, and behavior-change campaigns helped embed sustainability in daily habits. These efforts mobilized both campus and local communities, strengthened civic participation in marine environmental governance, and enhanced the resilience of nearshore ecosystems.

Co-Creating Ocean Narratives and Action Across Disciplines

NYCU's International Center for Cultural Studies (ICCS) hosted an online showcase for the "Aqua Futurism" International Workshop (Venice), reflecting on the outcomes of Contested Waters, a transnational collaboration carried out in Venice in October 2024. This project, supported by the ICCS Multispecies Justice research cluster and in collaboration with S.a.L.E. Docks and the Program in Environmental Humanities (NICHE) at the University of Venice, connects artists and scholars from Taiwan, Italy, and India. Through lagoon walks, boat trips, wetland ecological explorations, and sound-based practices, the project explores the geopolitical impacts of militarization and capitalization of water bodies, and conducts innovative research on the ocean. The project strengthens narratives about the marine environment, fosters social engagement, and promotes international, cross-sector collaboration.

15

LIFE ON LAND

2020-2024 Publications	34
2020-2024 Percentage of all Taiwan Publications	1.9%
Course Units	51
Student Engagement with Units on SDG 15	773

Research

Urban Forests and Climate Resilience

Professor Chun-Cheng Lin from the Department of Industrial Engineering and Management analyzed potential issues such as tree branch loss risk, maintenance costs, and disaster damage, and proposed policy recommendations to enhance the climate resilience of urban green spaces. The study balances the environmental benefits of urban forests with human risk management, and informs smarter green space governance. The findings were published in the journal, Urban Climate.

Experiential Learning for Terrestrial Biodiversity

The campus serves as a living lab in the course “From Shennong Slope to ESG: University Social Responsibility and Environmental Education.” Indoor sessions trace the historical transformation of local environments and use campus tree health checks and carbon stock audits to reveal ecological indicators. Field walks guide participants to observe on-site biodiversity and conduct basic monitoring, integrating history, species observation, and carbon accounting to promote terrestrial conservation and sustainable stewardship.

15 LIFE ON LAND

Social Impact

Hsinchu Xiangshan Wetland Eco Walk

The Service-Learning Center organized an eco-walk at Xiangshan Wetland, led by Professor Hsiao-Yun Chang (Asia University). Students learned about the endemic Taiwan fiddler crab and engaged in hands-on habitat stewardship by removing invasive halophytes (e.g., sea purslane and salt-tolerant grasses). In partnership with Hsinchu City's ecological conservation volunteers, the group concluded with a visit to the wetland boardwalk, deepening their understanding of biodiversity, habitat protection, and civic participation.

From Wartime Industrial Site to Wildlife Habitat

The NYCU "Sixth Fuel Factory" team and picture-book artists published The Big Chimney of Hsinchu Sixth Fuel Factory (June 2024) to share the history of one of Taiwan's few surviving WWII industrial sites. Narrated from the "big chimney's" perspective, the book follows its journey from construction and operation under Japanese rule, through postwar life as a military-dependent settlement, to today's restoration as a roost for protected bat species. The project weaves together heritage, community, and ecological conservation.

Education & Cultivation

Mountain Education and Leave No Trace

Co-organized with the Mountaineering Club, the annual “Yangmingshan Grand Traverse” turns the mountains into a classroom, blending nature education, physical challenges, and environmental ethics. In its sixth year, the event attracted 174 participants. Student leaders are trained in mountain skills, risk assessment, and team leadership while promoting the Leave No Trace principle. Participants build fitness, environmental mindfulness, teamwork, and self-awareness through respectful and low-impact practice.

15 LIFE ON LAND

Wetland Education and Sustainable Stewardship

A general-education lecture, “Wetland Education, Transmission, and Sustainability—The Huajiang Wetland Alliance,” featured Dr. Yi-Bin Fan (Forestry Research Institute, Ministry of Agriculture; former chair of the Alliance). The talk underscored the need to protect migratory birds, fish, and wetland flora; mitigate development pressures; and scale conservation through education and community engagement to cultivate public consensus on biodiversity and habitat sustainability in the region.

Stewardship

Campus Tree Governance and Greening

NYCU institutionalizes tree risk management and full-lifecycle care. An outreach session on “Campus Tree Risk Management and Mitigation” invited ISA-certified arborists to demonstrate instrumented inspections and explain safety assessments and risk reduction strategies. A companion talk on campus greening covered soil and tree health, pruning principles, and pest prevention. With graded inspections, preventive care, and restoration, the program reduces failure and disease risks and enhances canopy quality, biodiversity, and site resilience.

Wetland Education and Sustainable Stewardship

To advance wetland conservation and civic participation, the Community & Peer Education Center hosted “River Without a Mouth: What the Zhiben Wetland Remembers,” where author Han-Yau Huang unpacked the entanglements of ecology, local culture, and development. A “Wanli Wetland Habitat Care Day” followed, led by experts from the Society of Wilderness, combining field surveys with maintenance practices. The series links knowledge translation with action, strengthening biodiversity resilience across campuses and communities.

16.

PEACE, JUSTICE AND STRONG INSTITUTIONS

2020-2024 Publications	82
2020-2024 Percentage of all Taiwan Publications	5.4%
Course Units	516
Student Engagement with Units on SDG 16	10,490

Research

Safeguarding Human Rights and Institutional Justice

The International Center for Cultural Studies (ICCS) and the School of Law co-hosted a symposium marking the first anniversary of Taiwan's Anti-Human Trafficking Act amendments and the ban on forced labor, in partnership with the Taiwan Association for Human Rights, the Taiwan Labor Front, and Work Better Innovations. The meeting assessed progress and challenges one year on, with particular attention to whether employment systems for migrant workers and distant-water fishers align with international human rights and labor standards. The policy recommendations addressed system design, enforcement capacity, and cross-sector collaboration. ICCS also organized a talk on "Key Business and Human Rights Issues 2024," drawing on the International Institute for Human Rights and Business's Top 10 list to examine forced labor in supply chains, employer-paid recruitment, the human impact of content moderation on digital platforms, and risks to migrant workers in mining, fisheries, and urban settings during climate transition.

Spotlight on Emerging Law and Technology

The School of Law hosted the "2024 28th National Conference on Technology Law," covering national security and communications oversight, digital governance and international trade, intellectual property strategy and technology controls, global supply chains and labor rights, and digital health and global health topics. The program included focused sessions on the worldwide impact of the EU AI Act, cross-border data protection, financial technology, and international commercial arbitration. Gabriele Mazzini, lead architect on the EU AI Act, provided an in-depth analysis of the law's legislative background, risk tiers, and compliance mechanisms, and discussed its ripple effects for global AI R&D, industrial strategies, and regulatory trends. Through case studies and comparative perspectives, the conference advanced evidence-based legal inquiry and interagency policy coordination to address cybersecurity, cross-border data flows, supply-chain due diligence, and medical data governance.

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Social Impact

Innocence Project Service Internship

The “NYCU x Taiwan Innocence Project Service Internship” combines training with hands-on service so that students can learn and contribute to real-world post-conviction reviews. Interns work on evidence collection and legal review, study wrongful convictions and systemic gaps, provide psychosocial support to the wrongfully convicted, and participate in public advocacy, such as film screenings and international exchanges. By creating a complete learning chain from case rescue to policy recommendations, the program will, on the one hand, help those wrongly convicted regain their freedom and social integration and, on the other hand, cultivate legal talent with a human rights perspective, and promote a more transparent and accountable judicial system.

Youth Action for Mental Health Rights

During the 2024 summer break, the “Crusaders Psychiatric Service Team” visited Kaohsiung Municipal Kai-Syuan Psychiatric Hospital for a nine-day outreach program. Thirty-one students from the fields of medicine, physical therapy and assistive technology, and biomedical engineering organized a range of occupation-oriented activities, including morning exercise, crafts, cooking classes, and cognitive games. The initiative aimed to build confidence, enhance achievement and social interaction, and work with the hospital to reduce stigma around mental illness. The experience deepened empathy and professional identity and strengthened interprofessional teamwork, contributing to rights-based mental health care and community support.

Education & Cultivation

Refugee Survival Simulation Workshop

The Sustainable & Peer Education Center ran a series titled, “A Sustainable Memo for the Next Extraordinary Moment,” combining talks on civil defense and post-disaster recovery, a one-day basic civil defense training with Black Bear Academy, and an RPG-style “Refugee Survival” workshop co-organized with BridgeIRS. Participants simulated decisions from family evacuation to coping with hunger, disease, interrupted schooling, corruption, and displacement. A physician with Middle Eastern field experience shared frontline insights, turning knowledge into empathy and action. The program strengthened the understanding of humanitarian protection, the rule of law, and governance failure risks.

First-of-its-Kind Legal Studies Program for Medical Students

The School of Medicine launched the “Medicine and Law Credit Program” for medical students, which is structured in stages. Years one and two build legal foundations in civil and criminal law, procedures, and intellectual property. Years three and four focus on health law topics, including health law and policy, comparative health law, Taiwan’s National Health Insurance, and health governance topics. The program pursues three goals: strengthening legal literacy and compliance awareness, improving the prevention and resolution of medical disputes, and cultivating cross-disciplinary talent for health policy and governance. Using scenario cases, mock mediation and litigation, policy analysis, and co-teaching across departments, students learn to balance patient rights and quality of care while practicing professional communication and risk-management skills.

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Stewardship

Building Legal Literacy and Campus Safety

During “Friendly Campus Week,” the Military Training Office delivered a lecture series on traffic safety, drug abuse prevention, anti-bullying, and anti-fraud. Using current practices and case analyses, the series reinforced the importance of risk identification, reporting procedures, and self-protection. Ongoing communication and cross-unit coordination strengthen the campus safety chain from early warning to incident response and recovery, improving legal literacy and safety awareness across the university.

Global Dialogue on Digital Governance and Human Rights

ICCS hosted an online forum on “China, BRI and Implications on Digital Governance, Authoritarianism and the Future of Human Rights,” inviting scholars and activists from the Global South to critically examine the human rights risks in the “Digital Silk Road.” The discussion analyzed surveillance technology exports, data governance, and cross-border data flows, and explored how digital technologies are reshaping logistics and infrastructure governance, including Smart Cities and CCTV networks, with the potential to heighten social control. The dialogue promoted responsible institutions and fundamental freedoms, and advocated rule-of-law and rights-based approaches to digital infrastructure and urban governance.

17

NO POVERTY

2020-2024 Publications	80
Course Units	235
Student Engagement with Units on SDG 1	6,247
2020-2024 Percentage of all Taiwan Publications	10.6%

Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Research

Launching International Co-Creation for a Long-Lived Society

Our university has signed a memorandum of understanding with the UK National Innovation Centre for Ageing (NICA) and has become its first partner in Taiwan. The partnership will advance international R&D and local testbeds for a long-lived society and establish a Taiwan chapter of the VOICE global citizen network to collect public ideas and needs that inform longevity technologies and service design. Aligned with the national action plan for the aging technology industry, this collaboration will promote resource sharing across the government, industry, and academia, strengthen policy linkages, and broaden cross-sector impact. Beyond deepening Taiwan–UK exchanges, this relationship will spur domestic scholarship and industry investment in longevity innovation, and accelerate the development of a healthy aging ecosystem in Taiwan.

Taiwan–Japan Collaboration on Digital Finance and Techno-Diplomacy

In early 2024, our university launched the Data Finance Innovation Center (DFI) to drive data-centric financial R&D and standards-based international cooperation as a form of techno-diplomacy. President Chi-Hung Lin led a delegation to meet with the Sasakawa Peace Foundation (SPF) and the National Graduate Institute for Policy Studies (GRIPS). Building on our strengths in semiconductors and ICT, both sides will pursue an industry and academia co-creation model focused on collaboration mechanisms, data standards, trusted data flows, and talent development while planning joint international programs and shared research platforms to expand cross-disciplinary impact and global connectivity.

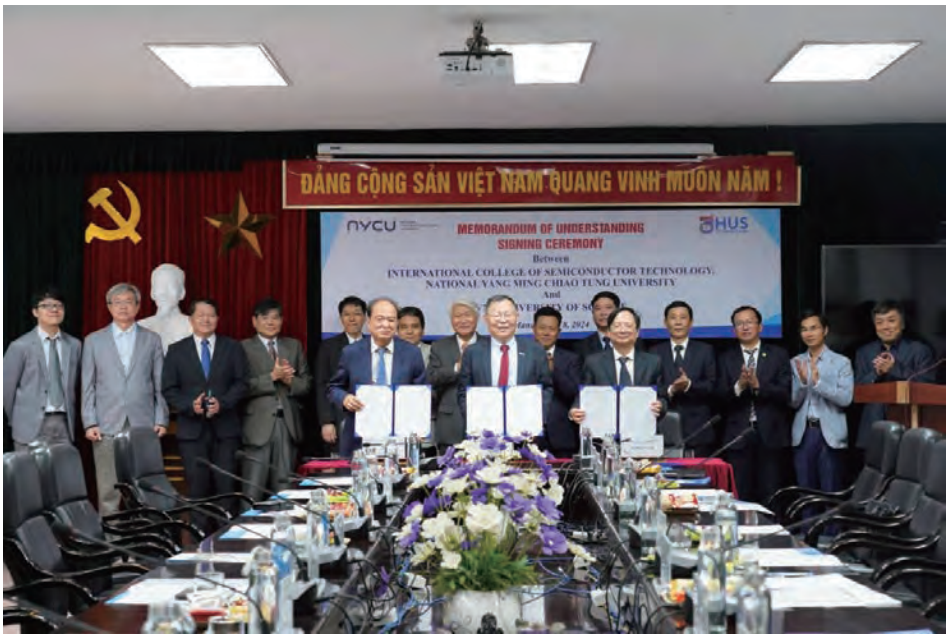
Social Impact

Taiwan–Japan Strategic Semiconductor Partner Forum

We hosted the inaugural “Taiwan–Japan Global Semiconductor Strategic Partnership and Innovation & Entrepreneurship Forum,” centered on joint Taiwan–Japan efforts to build a resilient semiconductor supply chain and cross-border innovation ecosystem. Taiwan’s Minister of Economic Affairs has outlined a medium- to long-term blueprint for regulatory coordination, science park governance, and investment cooperation. Stakeholders from the government, industry, and academia discussed alliance structures, cross-university and cross-institute research centers, resource sharing, patent pools, park-level strategies, startup acceleration, and cross-border collaboration models. Using our university as a base, we are promoting a Taiwan–Japan “Next-Generation University Technology Alliance” to cultivate talent with technical expertise, creativity, and humanistic literacy, strengthen knowledge and technology collaboration, and foster the shared prosperity of the global semiconductor ecosystem.

Expanding a Southeast Asian Collaboration Network

We organized the “2024 Taiwan–Malaysia Semiconductor Forum” in Kuala Lumpur, bringing together more than 100 participants from the government, industry, and academia to discuss industry trends, policy coordination, and research collaboration. The delegation also visited Malaysian universities and inaugurated the Taiwan–Malaysia Overseas Technology Innovation Center as a long-term hub for research exchanges and talent mobility. We signed MOUs with Pin Hwa High School in Malaysia and Hanoi University of Science, a member of Vietnam National University (VNU-HUS), extending a pipeline from secondary education to university partnership and joint research. These efforts deepen regional cooperation under the New Southbound Policy, enhance internship and exchange pathways, and accelerate the application of research outcomes in Southeast Asian markets.



Education & Cultivation

Advancing K12 Semiconductor Outreach

In partnership with TSMC, we are promoting the “Belight AI Semiconductor” K12 outreach program. Led by Professor Kuei-Ann Wen, the team developed the Rabboni smart sensing device and integrated it with MIT Scratch to create a gamified platform for semiconductors and the AIoT. The program has been implemented in elementary and secondary schools across Taipei, Hsinchu, and Taoyuan, embedding sensors into digital coursework and hands-on projects that build computational thinking and engineering literacy. Multiple high schools now offer a six-hour micro-course, “Big Brothers and Sisters Teach AIoT and Semiconductors,” taught by university students to foster a cross-age learning community. Together with the Hsinchu County and Taoyuan City governments, we launched the national “Win-Win Cup” competition, standardizing Rabboni to scale teacher and student capacity in ICT and semiconductor literacy.

Taiwan–Japan Joint Talent Development in Semiconductors

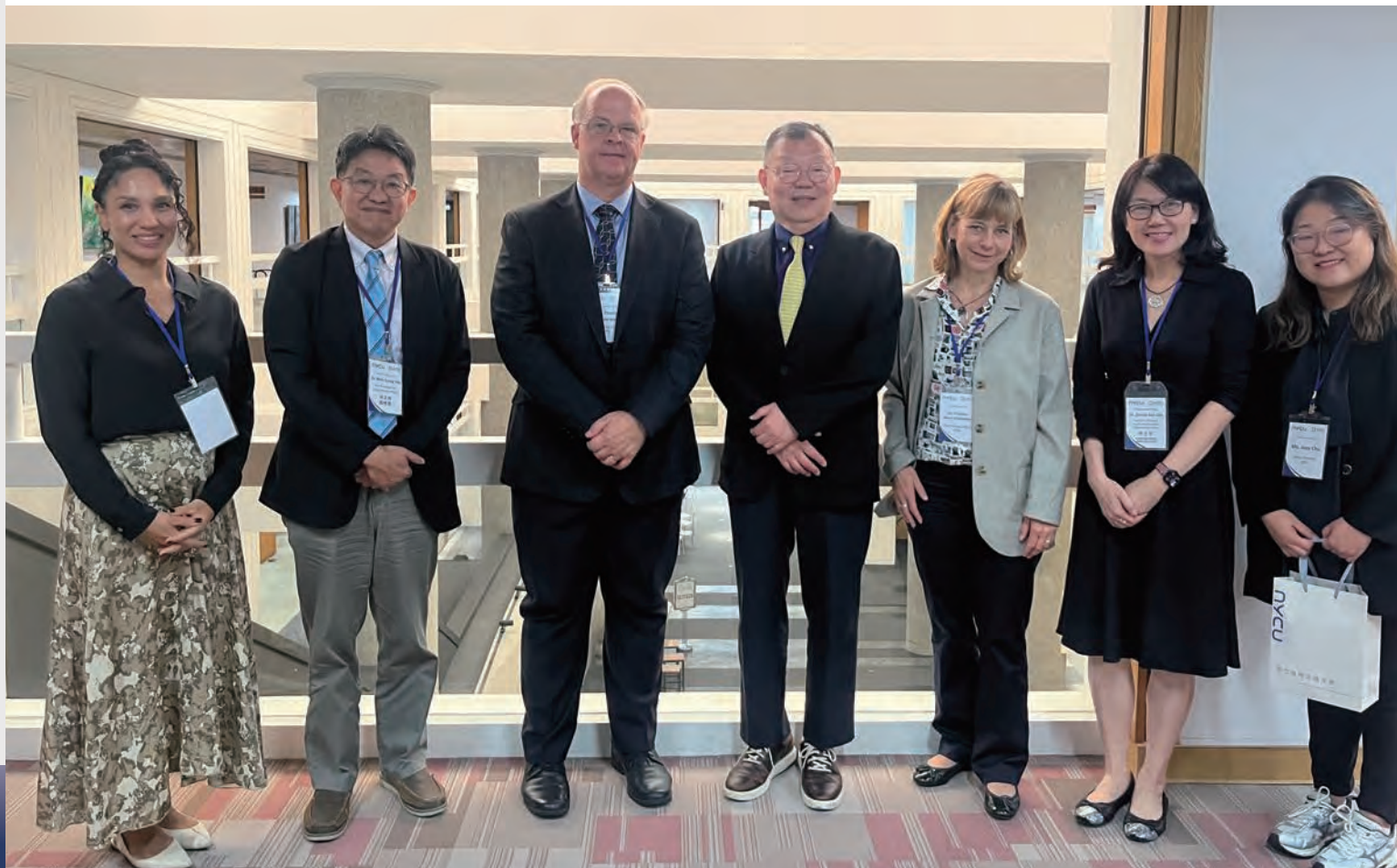
In June 2024, President Lin led visits to the University of Tokyo, Tokyo Institute of Technology, Hokkaido University, Tohoku University, Kyushu University, Kumamoto University, and TSMC's JASM in Kumamoto, Japan. The trip focused on semiconductor R&D, talent cultivation, and industry–academia collaboration, resulting in the signing of multiple MOUs. With Hokkaido University, we will pursue joint semiconductor research to support local next-generation onshoring while strengthening applications in biology and medicine. With Kyushu University, both campuses will establish semiconductor-focused joint laboratories tied to regional industry collaboration frameworks, connecting local firms to global supply chains. With Kumamoto University, we are advancing mutual credit recognition and joint lab plans to expand research exchange and help upgrade the local semiconductor sector. These actions reinforce Taiwan–Japan networks and talent pipelines, accelerating the deployment of key technologies and the establishment of international links.

17 EDUCATION & CULTIVATION

Stewardship

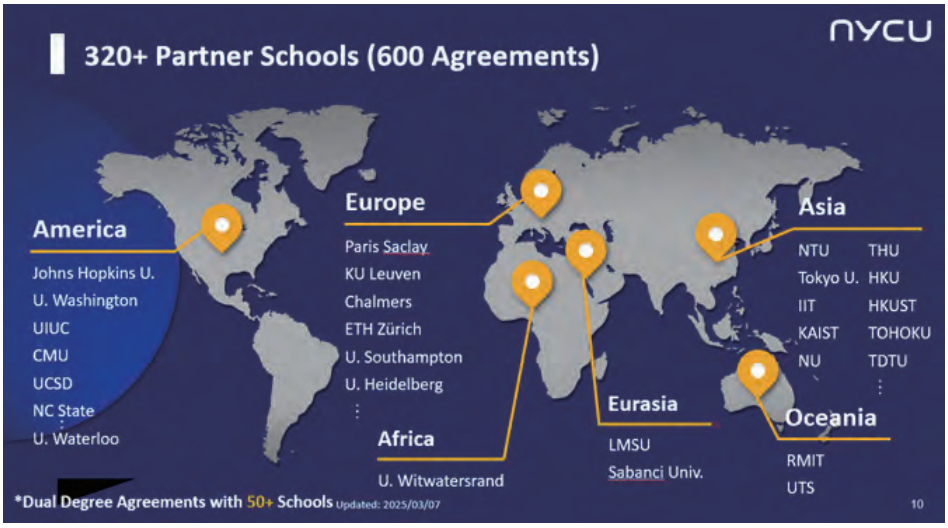
Joining APRU to Broaden Regional Impact

In 2024, we became a member of the Association of Pacific Rim Universities (APRU), enhancing our collaboration with 62 prominent research universities across 18 economies. Collaboration focuses on climate resilience, marine and terrestrial ecosystems, digital transformation, public health, and sustainable governance. In June 2024, our university participated in the APRU Annual President's Meeting, hosted by the University of Auckland. Under the theme of "Oceans - The World's Challenges Divide Us, Ocean Currents Connect Us," we launched a cross-domain dialogue on the impact of climate change on the ocean and society, exchanged implementation strategies and practical methods for climate justice, food and water security, and sustainable urban and rural areas, further strengthened the collaborative role of Asia-Pacific universities in research, policy advice and talent development, and deepened the partnership with member universities in the Pacific Rim.



Strengthening a Global Partnership Portfolio

We maintain partnerships with over 320 universities in over 45 countries across the Americas, Europe, Asia, Oceania, Africa, and Eurasia, spanning research collaboration, student exchange, and dual-degree programs. As of March 2025, we have signed approximately 600 international agreements, including student exchanges with roughly 200 institutions and over 50 dual-degree collaborations. In 2024, we launched a 3+2 dual-degree pathway with the University of Illinois Urbana-Champaign (UIUC) that allows students in our Department of Computer Science to apply to UIUC's Department of Computer Science or School of Information Sciences after three years of study and graduate with a bachelor's degree from our university and a master's degree from UIUC. Through a systematic strategic partnership layout and academic collaboration, the University continues to strengthen its teaching and research capabilities through high-quality international collaboration, cultivating talent with a global vision and local action capabilities.



Editorial Principles

To help stakeholders fully understand NYCU's sustainability governance and performance, this report is structured around the United Nations' 17 Sustainable Development Goals (SDGs). It systematically presents our outcomes in Academic Research, Social Impact, Education & Talent Development, and Campus Governance. All statistics are compiled by the responsible units on campus. Unless otherwise noted, currency is New Taiwan dollars (NTD).

Reporting Period

This report covers January 1 to December 31, 2024. To present trends and key developments comprehensively, some chapters reference the prior year or include updates through 2025, as annotated in the text.

Reporting Boundary

The scope primarily covers NYCU's nine campuses. Certain information also includes data from affiliated/auxiliary institutions.

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Publication Time

Previous edition: November 2024
This edition: November 2025
Next edition: Planned for November 2026

For past sustainability information and feature stories,
please visit the dedicated sections on our sustainability website.

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