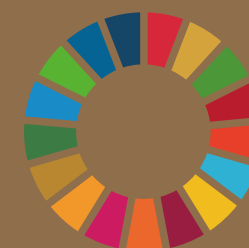


2020 SDGs
NCKU 2020
Annual Report



國立成功大學
National Cheng Kung University





The local NCKU community significantly contributes to the welfare of the global community. Faculty, staff, and students utilize a culture of knowledge and technological innovation by starting from an ethical foundation to support the disadvantaged for the betterment of society. This synergism connects cities to nations and promotes the idea of prosperity for all. The future of NCKU is intimately linked with humanity for perpetuity. As NCKU prospers so does our people and humanity.

President
National Cheng Kung University

Huey-Jen Jenny Su



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RESEARCH

63 publications **6%** of all Taiwan publications 2011-2020

Poverty and Health Nexus

Economically disadvantaged populations are vulnerable to nutritionally adequate and safe foods leading to many health issues. The prevalence of obesity is an emerging public health issue in poorer populations. The researchers at the college of medicine found that food insecurity possibly increases the likelihood of obesity in poor youths. It is essential to understand the poverty and health nexus to amend health problems in poverty-affected populations. ☺



Healthy City Research Center

Our Healthy City Research Centre (HCRC) focuses on research promoting comprehensive policies and plans for the health of Taiwanese cities. The center works closely with the local city governments in developing plans and practices for improving people's lives. ☺

EDUCATION

311 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- UP 7006 Plan Investment and Evaluation
- EMBA 6886 Operations Management
- IB 7034 International Investment Theory
- ECON 6503 Economic Development: Theory and Policy
- IIM 4221 Operations Analysis and Improvement ☺

ACTION

Aid for Living Expenses

To help students from disadvantaged backgrounds university provides on-campus part-time Job opportunities. It also helps students in acquiring work experience and life skills. ☺



Study Abroad Opportunity

University's overseas study program supports students from economically disadvantaged families on short-term overseas studies to broaden their horizons. Since its launch in 2018, this project has sponsored 56 students so far. ☺

Higher Education Deep Cultivation Program

Education is vital for upward social mobility. Through its Higher Education Deep Cultivation Program, the university provides admission support to students from low socioeconomic status. It provides financial, learning, and living support to students throughout their degree programs to successfully complete their education. ☺

Affordable Housing and Rental Subsidy

NCKU provides affordable on-campus housing to students with 5120 beds. For off-campus accommodation, rental subsidy programs support students with financial difficulties. ☺



Emergency and Condolence Allowances

Accidents or illnesses can negatively impact the financial status of students or their families. Following its strong commitment to reducing barriers to educational achievement, the university offers timely financial assistance to students and their families, thus playing a small role in helping students to overcome challenges in completing their degree. ☺

Support for Low-Middle Income International Students

As part of our commitment to education, we actively provide admission to students from low- and middle-income countries. Between 2016 to 2020, NCKU has subsidized up to \$400,000,000 NTD towards tuition and accommodation for international students from 47 developing countries. ☺

OUTREACH

Public Outreach

NCKU BOOKS-ONE City is a mobile library, spreading knowledge as they travel through 15 administrative districts of Tainan. It promotes knowledge interactions between the NCKU community and locals. The goal is to venture out from the library and campus, beyond traditional geographical boundaries, into the hearts of communities. ☺

RESEARCH

68 publications **4%** of all Taiwan publications 2011-2020

Sustainable Development of the Seafood Industry

Shrimp is an integral part of the seafood chain and culturing it on a mass scale has its challenges. University's International Center for the Scientific Development of Shrimp Aquaculture is working to solve the difficulties faced by aquaculture industries. The center works on minimizing risks of disease outbreak and transmission, producing resistant shrimp varieties, establishing guidelines for indoor shrimp breeding, and developing global standards for sustainable and safe seafood systems.🔗



Agricultural Biotechnology Research Center

Technological interventions in farming industries are a key towards moving to sustainable food systems. Researchers at this center are developing technologies for the quick identification of diseases in fish farming. The center has developed and applied artificial intelligence-based monitoring systems for the Taiwan aquaculture industry. Through big data analysis, the center helps farmers design the best breeding conditions to optimize fish reproduction that is difficult to achieve by traditional breeding methods.🔗

EDUCATION

229 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- GE 2024 The Tainan Dietary Culture
- LS 7712 Introduction of Key Technology of Agriculture Biotechnology
- GE 2429 The Advantages and Disadvantages of GM Food
- LS 7715 Agricultural Product Processing and Value Added
- TAS 9191 Special Topics in Translational Research for Agriculture 🔗

On-Campus Healthy Meal

We at NCKU provide a healthy and affordable meal to students and staff through our on-campus dining services. The two dormitory restaurants have various options like vegan, non-vegetarian, dairy products and halal options, thus satisfying students need.🔗

OUTREACH

NCKU is working with local communities to teach them the importance of sustainable farming practices through on-field workshops. Through these workshops, students and locals share and learn from each other on various aspects of agriculture and its economy.🔗

ACTION

Promoting Good Agricultural Practices

Through the university social responsibility (USR) initiative, NCKU links all its scientific and technological solutions to on-ground local solutions. The researchers assist farmers with technology to reduce chemical fertilizers and increase productivity, thus creating a friendly farming environment.🔗



2 ZERO HUNGER

RESEARCH

5387 publications 9% of all Taiwan publications 2011-2020

Virus Rapid Screening Test

Quick and easy detection of viral particles is vital for early diagnosis, especially during the pandemic. Professor Jiunn-Der Liao and his team have developed nanoscale trapbased capture technology to catch viral particles. His team is currently developing a COVID-19 rapid screening and detection method that can give results in under one minute.🔗

3 GOOD HEALTH AND WELL-BEING




i-love Exercising

AI-based a pplication developed by Medical Device Innovation Center provides a personalized exercise system for the elderly population. The smart exercise scheme will help reduce the need for the nursing workforce and provide remote consultation and preventive care.🔗



MOHW-NCKU Health and Welfare Data Science Center

Established in 2017, the center collaborates with academicians, industries and policy makers to enhance the healthcare and wellbeing of Taiwan.🔗

EDUCATION

1142 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- GE 2121 Promotion of Occupational Health
- GE 2028 Physical Therapy and Women's Health
- PSY 3019 Introduction to Neural and

- Cognitive Modeling
- MED 4315 Theory and Practice of National Health Insurance
- CM 7159 Human Genetic Epidemiology and Next-Generation Sequencing Data Analysis 🔗

ACTION

Counselling and Wellness Support for Students and Staff

The university counselling and wellness service division offers free mental, general, and sexual health support to students and staff. The division conducts seminars and surveys before the start of each semester to raise awareness about psychological health. The division 's staff regularly conducts workshops, training, and support sessions to encourage a healthy environment on campus.🔗

Smart Healthcare Clinical Decision Support System

In response to the health challenges brought by the COVID-19 pandemic, NCKU researchers integrated several smart medical treatments to increase the quarantine efficiency by 5 to 6 times.🔗

COVID-19 Diagnostic System

Providing health facilities during COVID-19 became a challenge for hospitals worldwide, and to solve that, NCKU hospital developed an online diagnostic system in 6 different languages. It enables patients to fill in data on their travel, occupation, contact and virus cluster history before visiting a doctor.🔗

OUTREACH

Charity Events for Epidermolysis Bullosa

Epidermolysis Bullosa (EB) is a rare genetic condition that causes skin diseases and ulcerations, and patients must use gauzes and treatments throughout their lives. As a leading research center on EB and to reduce the financial and psychological burden for patients and their families, NCKU organized charity events. These events aimed to draw attention to the disease and to raise funds for EB patients.🔗

Providing accessible community healthcare

NCKU hospital staff and students regularly visit local communities to provide health services and education.🔗



RESEARCH

519 publications **7%** of all Taiwan publications 2011-2020

Evidence-Based Practice Curriculum Development

Evidence-based practice (EBP) learning is valued globally to facilitate effective decision making and superior patient outcomes in medical education. Professor Ying-Ju Chang and his team have developed an EBP curriculum for undergraduate nursing students. The developed curriculum successfully increased the competency and confidence of the students. ☺



Maker Education

To promote entrepreneurship, maker education, an innovative curriculum that cultivates logical thinking and problemsolving skills are critical for students. Professor Chin-Feng Lai and his team have been designing a curriculum based on Internet-of-Things programming and peer learning. It trains students' entrepreneurship by integrating maker education into a programming course and developing their computational thinking ability. ☺

EDUCATION

982 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- GE 1045 Exploring Tainan
- CCEP 1004 The Practice on Design Thinking and Machine Learning for Covid-19
- UP 7003 Philosophy of Science
- EDU 7018 The Study on The International Educational Policy and Management C
- CCEP 2091 Slideology and Presentation ☺



ACTION

X-Village

X-Village is an experimental education provides to cultivate cross-disciplinary talent and provide a platform for cross-disciplinary exchange. The university offered a high-intensity IT course to provide information technology (IT) skills to students majoring in a field other than IT-related areas. Upon completing the course, the students gained basic IT skills opening a range of future career doors for them in the industry. ☺

NCKU Library

Our library is accessible to the public, making the educational resource available to all. In addition, NCKU library has created an innovative Mobile Library Course by integrating its resources and courses on innovation and narration, specific theme designs and displays to impart knowledge to Tainan citizens. ☺

Sustainability Education

Our university offers a Certificate Program in Sustainable Development (CPSD), open to all degree students, and focuses on addressing real-world issues related to sustainability. CPSD is an international, interdisciplinary English program that allows students to distinguish themselves by supplementing their degree with a specialization in sustainability. ☺



Life-long Learning School

The university is committed to providing diverse and latest learning courses for students and the public. Our life-long learning school provides an open platform for the public and students to learn new skills or upgrade their existing knowledge in various fields. ☺

Widening Educational Support

Achieving our goal of providing quality education to all, we offer a special admission quota to students from new immigrants' families. We also make every effort to provide a happy learning environment for students with a disability by providing individual educational, moral, and financial aids. ☺

OUTREACH

Program the World

To increase rural students' access to the latest programming course, Professor Wen-Yu Su has initiated the 'Program the World' project. The project provides rural students with free resources and opportunities to cultivate their programming skills. ☺

RESEARCH

112 publications **9%** of all Taiwan publications 2011-2020

Gender Re-Engineering Humanities Education

Sensitising students on various gender issues is a positive way of creating a more humanistic society. NCKU Center for Gender and Women Studies, in collaboration with professors from the College of Liberal Arts, has launched this Gender Re-Engineering Humanities Education plan. These centres engage in a dialogue, deliver lectures and organise seminars for students and staff mainly from engineering and medicine areas. Through this constant engagement, there has been gender awareness among STEM students and staff. ☺

Women Mapping Anping

Anping is known as the birthplace of Tainan 's City, and it used to be the commercial, military, and fishing port. While the history of its development is well recorded, the historical contributions of women who supported the development of Tainan have not received much attention. Historians at NCKU are now studying and recording the role women played in the development of Anping from a historical port to a modern metropolis. ☺

Successful Women's Silhouette

Women have played a significant role in the development of our university. Successful Women's Silhouette plan intends to record and understand wom-

en's participation and contributions during the journey of NCKU. With this, society can appreciate the role women played in the growth of our university. ☺

EDUCATION

409 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- TWL 7410 Gender and Cultural Studies
- GE 2179 Women and Politics in The Old China
- LAW 7861 Seminar on The Law of Same-Sex Marriage (1)
- GE 2228 Gender Relations
- GE 2557 Gender and Society ☺

ACTION

Parental Leave and Workplace Child Support

Pregnant female employees can take up to eight weeks of paid leaves. Our campus has a total of 11 breastfeeding rooms to support mothers. There are 12 priority car parking spaces for pregnant women and those with children under six years of age across the campus. Our on-campus playschool provides subsidised accessible childcare facilities for staff and students. ☺

Women Leadership

Dr. Huey-Jen Su became the president of NCKU in 2015. She created history by becoming the first female president in the NCKU's 83-year journey and was re-appointed as president in 2019. ☺

Gender-Friendly Toilets

To solve the problem of uneven toilet space allocation for females and transgender people, the university has established gender-friendly toilets across the campus. The establishment of gender-neutral restrooms will promote mutual respect and toilet etiquette among all and break gender stereotypes. ☺



OUTREACH

NCKU regularly holds seminars to promote awareness of gender equality and to devise an adequate foundation for gender equality education. Movies are a fantastic medium to spread awareness, and our Gender Equity Education Committee routinely organise gender film festivals to educate students and the public on gender equality. ☺

5 GENDER EQUALITY




亞洲婚姻移民女性

Marriage Migrants in Asia: Mobility and Agency

移動與能動

Editors:
Su-lin Yu (游素玲)
Lekun Tan (陳麗君)

RESEARCH

593 publications 13% of all Taiwan publications 2011-2020

Estimation of Cyanotoxins Risk

Excessive growth of cyanobacteria in freshwater bodies is a global issue for water utilities as many are toxins or odour producers. These cyanotoxins can cause a significant issue for the drinking water supplies. Interpreting and managing the risks associated with cyanobacteria in drinking water reservoirs has always been a challenge. Professor Tsair-Fuh Lin and his team have developed a molecular-based method to quickly and precisely quantify the risks for cyanotoxins.

Research Center for Water Science and Technology

This is an interdisciplinary research center with researchers from several departments working together. The center works on the phenomenon of natural water flow, water and ocean energy, water environment conservation, water resources utilization and disaster prevention.

UAV for Water Management

The traditional water quality survey involves a lot of human resources, high cost, and a long time. To overcome this, researchers at NCKU has developed unmanned aerial vehicle (UAV) based water sampling technology. This UAV water motoring technology is efficient and provides timely data to the water managing agencies.



ogy is efficient and provides timely data to the water managing agencies.

EDUCATION

116 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- EV 7028 Special Topics on Water Treatment Engineering
- EV 8000E Biological Principles for Environmental Engineering
- EV 7029E Water Quality ManagementEMBA 6886 Operations Management
- EV 5001 Water Pollution Control
- EV 7012 Advanced Treatment Technology of Wastewater

Rainwater Reuse

Our university has an efficient rainwater storage system, and the stored water is used in gardening, flushing toilets, and supplementing Cheng Kung Lake on the campus. From August 2016 to August 2021, 32,360 cubic meters of water have been processed through the rainwater reuse system.

OUTREACH

Our researchers regularly organize training courses and workshops on water management for local communities. In 2019 Department of Environmental Engineering conducted hands-on training on algae toxicity monitoring for local water utility personnel. These training workshops are an efficient way of transferring skills from universities to the local communities.

ACTION

Free Drinking water

NCKU provides free drinking water to its students, staff and visitors through more than 250 water dispensers on the campus. Each building floor in our campus has at least one free drinking water dispenser providing hot, warm and cold water to everyone.

6 CLEAN WATER AND SANITATION



國立成功大學

成功.光復及勝利校區雨水貯留系統工程

Campus Rainwater Retention System



RESEARCH

3451 publications **13%** of all Taiwan publications 2011-2020

Hi-GEM

The discovery and development of novel green energy materials is a necessity for providing affordable, reliable, sustainable, and clean energy for all. The university's Hierarchical Green-Energy Materials (Hi-GEM) Research Center is a hub for researching novel cross-dimensional green energy materials, bringing researchers on a common platform for collaboration. The center's broad focus areas include solid-state batteries, secondary batteries, supercapacitors, solar cells, fuel cells, and integrated energy systems. The center works closely with industries in developing novel green materials. ☞

7 AFFORDABLE AND CLEAN ENERGY



Research Center for Energy Technology and Strategy

The researchers at this center work in renewable energy, carbon capture technology, energy policy, and the development of educational programs. The center actively reach out to industry and government to raise and provide solutions to energy issues of national importance. Successfully many key technologies have been developed and implemented in the following fields: (1) monitoring and maintenance of offshore wind farms; (2) flexi-fuel technology for energy saving and emissions reduction; (3) microalgal-fixation of carbon dioxide; (4) composite function architectural design; (5) smart energy grid and energy storage; and (6) energy resources and policies. ☞

Smart Grid Architecture

Taiwan's Kinmen area is an isolated island power grid, and the power supply cost is much higher than that of the main island. To solve that, researchers at NCKU, with the help of information systems, IoT and blockchain technologies, will provide a smart grid architecture to Kinmen. ☞

EDUCATION

236 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- GE 2042 Energy Strategy and Policy
- GE 2053 Local Collaborative Adaptation for Climate Change
- CHE 7068 Artificial Photosynthesis
- IBPE 5002E Solar and Photovoltaics Engineering
- IBPE 5005E Clean Combustion and Pollution Control ☞

ACTION

Microalgal Carbon Fixation

In light of the increasing demands for greenhouse gas reduction, Professor Jo-Shu Chang's team has established Taiwan's first fully automatic microalgal flue-gas carbon fixation plant in the China Steel Co. (CSC) factory. This technology has already been transferred to CSC. His team has also established a 300-ton scale microalgae cultivation plant on the university's An-Nan Campus, one of Asia's largest and most complete microalgal biorefinery demonstration plants. ☞



CK-Bike

Riding a bicycle is a fun, healthy, environmentally friendly, convenient, and energy-efficient mode of transport for getting around the campus. University has its cycling infrastructure, and the access requires a 49 NTD/semester registration fee. ☞

Water Chestnut Shell Waste to Energy

Tainan's Guantian is one of the largest producers of water chestnut in Taiwan, and more than 90% of chestnuts shell are abandoned for open burning. The team led by professor Hung-ping Lin solved this issue by turning waste shells into biochar, a renewable and green fuel. ☞

OUTREACH

Energy Education Resource Center was established in the university in collaboration with Taiwan's Ministry of Education. The center regularly conducts workshops, online courses, and exhibitions to educate the local community on the importance of clean, affordable, and renewable energy. The center also provides training to school teachers on various aspects of energy education. ☞

RESEARCH

255 publications **7%** of all Taiwan publications 2011-2020

ICT and Economic Growth

The information and Communication Technology (ICT) revolution has stunningly transformed the economies of the world. All empirical studies show that ICT has significantly contributed to economic growth and changed working environments. Professor Wung-Lik Ng at our university has tried to develop a theoretical model to justify the above findings. ☺

8 DECENT WORK AND ECONOMIC GROWTH



App to Prevent Workplace Bullying

We believe that providing a safe working environment is essential for inclusive and sustainable economic growth. Professor Huan Fang Lee developed an app for automatically detecting and classifying nurse bullying levels in hospitals in collaboration with researchers from various institutions. The app helps nurses self-assess workplace bullying at an early stage. This app can help nurses to work in a safe environment. ☺

EDUCATION

688 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- ID 7236 Concept Commercialization and Minimal Viable Product Validation
- CCE 9431 Queuing Theory
- ACC 4024 CPA Practice and Trend of Professional Development
- ID 8231 Business Innovation and Strategic Management
- BA 6034 International Marketing ☺

ACTION

Graduate Employability

NCKU graduates are most sought after by employers in Taiwan. The university was ranked #1 in 2021 by business houses in Taiwan's top job hunting website survey. ☺



Student and Teacher Associations

University has a thriving teacher association that protects their rights and interests. There are various associations and clubs for students to promote cultural activities. The associations serve as a platform to improve their studying and working conditions on the campus. ☺

Safe Work Environment

At NCKU, we take any form of sexual harassment seriously and regularly sensitize our students and staff on gender issues. We have a strict policy to prevent, report, and punish any form of sexual bullying. Our staff are regularly trained to be aware of their responsibility to ensure that the campus is safe and welcoming for all. ☺

OUTREACH


NCKU regularly conducts free events like workshops, online seminars, vocational training, and educational courses that are open to the public. These events offer local communities, businesses, and NGOs opportunities to learn and build capacity for better economic developments. ☺



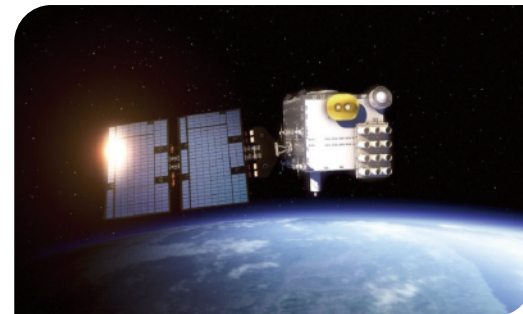
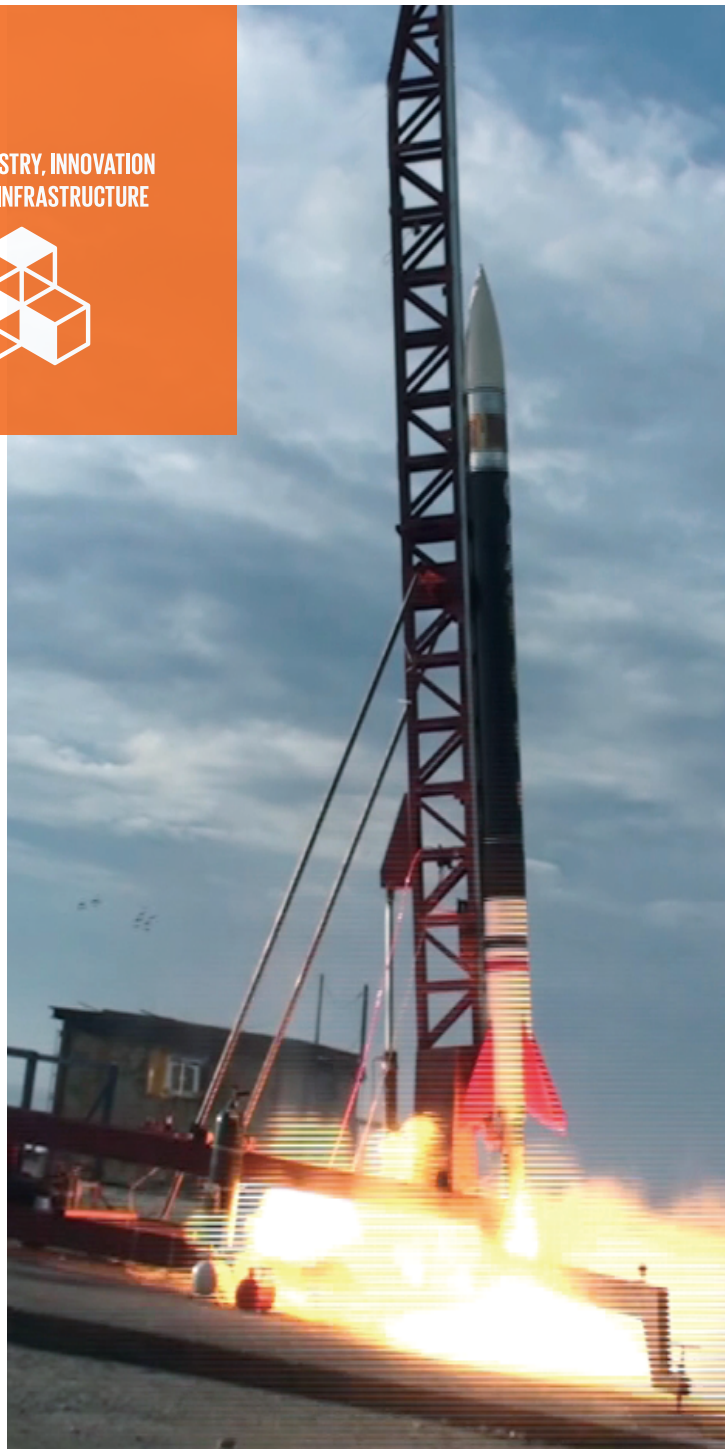
RESEARCH

999 publications **9%** of all Taiwan publications 2011-2020


Space Technologies

Space technologies already play a vital role in infrastructure development and will be crucial for future industries and innovation. Our researchers are working on satellite development and launching rockets. In 2019, we were the first university in Taiwan to successfully launch a 1500-kg thrust two-stage hybrid propellant rocket. NCKU is also working on developing micro and small satellites in collaboration with its national and international partners. 

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Intelligent Manufacturing and Industry 4.1


Presently the world is witnessing Industry 4.0, which involves automation of manufacturing and industrial practices by applying smart technologies. Professor FanTien Cheng has established an Intelligent Manufacturing Research Center to promote the idea of Industry 4.1, which involves using Industry 4.0 technologies to achieve the goal of zero defects for all products. The centre is working on cutting edge automation technologies and is dedicated to assisting various manufacturing industries to achieve the goal of nearly zero defects of all manufactured products. 



EDUCATION


607 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- TM 7408 Theory and Application of Wireless Communications
- COM 6010 Construct IT Infrastructure Services in Data Center
- LAW 6258 Case Studies on Copyright Law
- GE 2583 From Creative Invention to Patent Protection
- ME 3129 Introduction and Applications of Deep Learning in Artificial Intelligence 

ACTION


GLORIA

Global Research and Industry Alliance (GLORIA) connects industry partners to researchers at NCKU. The GLORIA helps industries link up with NCKU's abundant resources, thus supporting them with technological research to stay ahead in the market. 


Fostering Innovation

NCKU Innovation headquarters aims to encourage, develop and support innovative research that addresses real-world challenges. There are over 525 companies that use our inventions, and we have generated more than 90 million NTD through licensing royalties for 11 consecutive years (2009-2019). The innovation headquarters supports several state-of-the-art research centers that are actively working in collaboration with the industries. 

Start-up Accelerator

Our start-up accelerator centre helps students and staff to turn their innovative ideas into commercial reality, thus creating an entrepreneurial spirit among NCKUers. The center also provides courses related to entrepreneurship to motivate students to become job creators. 

Smart Campus Security

A safe campus is a basis for making educational environments welcoming for everyone. NCKU is the first university in Taiwan to incorporate AI in the campus security system. Since its complete launch in 2020, the intelligent security system has already assisted with several traffic accidents, COVID-19 contact tracing, and emergencies on the campus. 



OUTREACH

Universities can play a significant role in the sustainable infrastructure development of cities; with this belief, NCKU in 2020 has launched the Shalun Ecocity initiatives in partnership with industries, academia and governments. The construction of Shalun Green Energy Science City in Tainan is underway, and our initiative will bring researchers, industries and government on one platform to provide smart, sustainable solutions in developing this new city. 



RESEARCH

112 publications 5% of all Taiwan publications 2011-2020

Mapping Regional Wellbeing

One of the reasons for health inequalities across the world is the lack of health insurance. The introduction of universal health coverage (UHC) can reduce or eliminate health inequality. Researchers in NCKU studied the impact of mortality and residence in reducing health and well-being inequality by Taiwan's UHC. The study found the ineffective outreach of health interventions even with UHC, leading to a higher mortality rate in rural communities. Thus, they recommended that more work be undertaken to reduce the mortality rate in rural areas.



Politics and Ethnic groups

Ethnic diversity in a population affects the politics of that country. Professor Yi-Ting Wong and his colleague studied to understand the effect of ethnic groups on strategies of political parties in different countries. Understanding political dynamics in multi-ethnic societies is vital to reducing inequalities.

EDUCATION

397 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- GE 2593 Globalization and Humanistic Solitude
- GE 2039 Public Speaking in Taiwanese
- CLA 2009E Trends in Global Cultural Heritage and Archaeology/IM 4221 Operations Analysis and Improvement
- FLL 7621E Seminar on Sociolinguistics
- LAW 7865 Seminar on Indigenous Law (1)

ACTION

Support for People with Disability

At NCKU, we believe in welcoming people with disabilities so that they can achieve their full potential. Ours is a disability-friendly

campus with all the required infrastructure to make their stay a happy experience. We also provide individual educational, housing, counselling, and financial support to encourage them to study on our campus.

Indigenous Student Resource Center

NCKU has set up Indigenous Student Resource Center (ISRC) to encourage Indigenous students and build a multicultural campus. The ISRC provides educational and counselling support to aboriginal students. The center's mission is to establish NCKU as the country's primary aboriginal culture teaching and research university.



Financial Aids

We provide subsidies and scholarships to encourage students from underprivileged and minority communities to enrol for higher education.



Mentor System

Mentors play a crucial role in enhancing the university experience for a student. NCKU has a mentoring system in place through which each student is assigned a mentor. These mentors guide students through their university work and life. Mentoring is an excellent way of reducing inequalities by providing a personal support system to underprivileged students.

Raising Awareness about LGBTQ

Dispelling myths about the LGBTQ community brings mutual respect and acceptance among the general public. We at NCKU regularly organise seminars, newsletters, and screen movies to sensitise NCKUers about LGBTQ issues.

OUTREACH

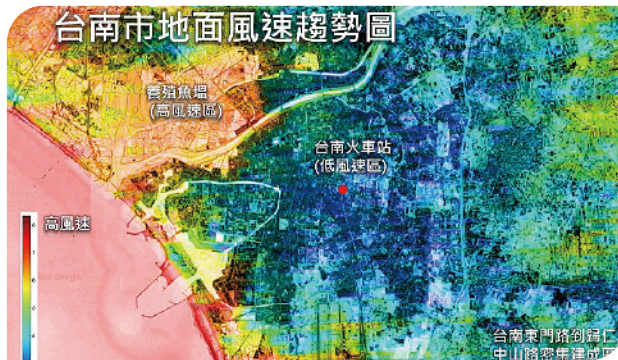
NCKU students and staff routinely conduct public seminars, talks, and activities to educate the public on LGBTQ topics. We aim to change society towards gender and sexual diversity through these activities, thus reducing inequality in the population.

RESEARCH

870 publications 12% of all Taiwan publications 2011-2020

Future Cities

It is estimated that by 2050 more than two-thirds of the world population will live in urban areas. Our researchers work in broad research domains to provide innovative sustainable solutions for future cities, such as IoT technologies for environmental monitoring and disaster prevention, circular local economy, and resilient infrastructure. NCKU is actively participating with the local government to develop intelligent technologies for the ambitious Shalun Smart Green Energy Science City project. NCKU team has also established IoT based environment observation network for Tainan and Kaohsiung cities.



Future Transportation

Electric, connected, and autonomous vehicles will provide mobility solutions for our future cities. These vehicles will help increase safety and reduce environmental footprint. NCKU autonomous vehicle research team are undertaking cutting-edge research and has successfully developed working prototypes.

EDUCATION

609 courses offered across 11 colleges in 2019-20 academic year.

ACTION

Preserve and Promote Cultural Heritage

The cultural heritage of local populations is an enabler for building sustainable cities. It is the culture through which people find answers to questions like who we are, where we have been, and where we are going, and any development cannot be sustainable without it. Professor at NCKU regularly takes up restoration projects of heritage buildings inside and outside the campus. Currently, NCKU is undertaking a massive project titled Four Hundred Years of Fort Zeelandia. The project recreates Tainan's 400-year history, and the findings will be presented to the public through various historical, popular, and territorial perspectives.



Sustainable Commuting

NCKU is actively taking steps to promote sustainable commuting among its staff and students. To endorse low carbon travel, our university encourages staff and students to use sustainable modes of transport such as walking, cycling, electric, and public vehicles. Among the many sustainable community initiatives in place at our campus are:

- 500 CK-Bike for NCKU digital ID cardholders, free for the first 60 minutes.
- 9,463 bicycle parking spaces and 2 electric vehicle charging stations.
- Every semester we give away hundreds of free second-hand bicycles to incoming students.
- Dedicated pedestrian walking lanes across the campus.
- Discounted annual season tickets for Taiwan High-Speed Rail.

OUTREACH

Taiwan will become a super-aged society by 2026, and for sustainable, inclusive cities, it is essential to improve the quality of life for older people in urban communities. Our faculty and students are enthusiastically working with local older populations to develop a sustainable society.

11 SUSTAINABLE CITIES AND COMMUNITIES



RESEARCH

414 publications **12%** of all Taiwan publications 2011-2020

Enhancing Bio-Based Chemical Production

Synthesis of bio-based chemicals which are environmentally friendly is crucial for sustainable production. Professor I-Son Ng and her team have been working on improving the production of cadaverine, an important chelator and additive in chemical industries. Her latest research uses CRISPRi technology to enhance cadaverine production in microbes. ☞

Microalgae-to-Biofuel

Optimising the production of biofuels will have more significant economic benefits and acceptability. Researchers at NCKU applied process integration and design to upgrade the pathways of microalgae-to-biofuel production. They used life cycle assessment to evaluate the environmental impacts of the upgraded pathways and found them to be more eco-friendly than earlier methods. ☞

EDUCATION

284 courses offered across 11 colleges in 2019-20 academic year.

ACTION

Models Without Styrofoam

The use of Styrofoam in constructing models is convenient but not environmentally friendly. Styrofoam is made of styrene, challenging to recycle and takes up to 500 years to decompose in a landfill. In 2019, the Department of Architecture decided to prohibit the use of Styrofoam to construct models. It is the first initiative by an architecture department in Taiwan. ☞

Circular NCKU

NCKU has launched 'Circular NCKU', a circular economy to promote a sustainable economy in Taiwan. We will train students to become future workforce and leaders in companies and governments to champion the circular economy concepts through this course. ☞



Pay for Laboratory Waste

In a university system, laboratories are the most significant contributor to solid waste. We implemented a system of user-pay for waste to motivate laboratories to cut down their waste output. After implementing this scheme, the university has seen up to a 10% reduction in its laboratory waste. ☞

Bring Your Bowl

To promote sustainability, dormitory restaurants on the campus encourages students to bring their lunchbox and cutlery. This initiative has helped restaurants drastically reduce their plastic waste. The restaurants provide discounts to those who bring their own bowls or lunchboxes for takeout to incentivise the scheme. It is a win-win for both the restaurants and students, as everyone saves money. ☞

OUTREACH

We constantly engage with industries to implement the concept of circular economy in their business models. Our Institute of Architecture partnered with the business world to conduct research and design bricks from waste papers. We also have a Circular Economy Club that routinely organises talks and seminars to educate the public about the benefit of sustainable consumption and production. ☞



12 RESPONSIBLE CONSUMPTION AND PRODUCTION

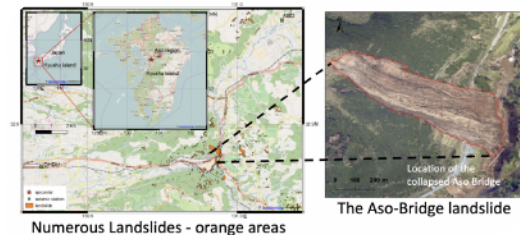


RESEARCH

508 publications **12%** of all Taiwan publications 2011-2020

Mitigation Technologies for Landslides

Climate change is increasingly causing severe natural disasters globally. Landslides are also most likely to increase under the potential intensification of the hydrological cycle. Effective detection of landslides is vital to mitigate their severe impacts. Our researchers are continuously working on technologies to detect, prevent and predict landslides. They have developed a semi-automatic system for landslide detection and location, which can be employed to prevent major disasters. ☺



Climate Data Acquisition

Environmental monitoring and data acquisition are crucial for analyzing the trends in weather, oceans, and landscapes due to climate change. Earth observation satellites provide invaluable data to predict and analyze global climate changes. Our scientists are working in close collaboration with international communities on satellited development programmes. It will help in the accurate forecast of extreme weather conditions, thus helping local governments in disaster preparedness. ☺

EDUCATION

609 courses offered across 11 colleges in 2019-20 academic year.

ACTION

Commitment to Carbon Neutrality

We have adopted an ambitious policy to reduce our greenhouse gas (GHG) emissions and achieve carbon neutrality by 2041 by completing the following targets:

- Reduce GHG emissions to the year 2010 levels by 2024.
- By 2029, reduce emissions to the year 2000 levels.
- Reducing our carbon footprint by half in the year 2031. ☺



Tree Planting and Care

Trees help us fight climate change as they act as a natural carbon sink, and planting them also improves the urban environment. NCKU is actively working towards making its campus greener by simultaneously working on various activities such as:

- Routinely organizing plantation drives on the campus.
- Identifying and protecting older trees on the campus.
- Setting up an electronic map and database of campus trees for effective management and education.
- Attaching QR code to each tree so that anyone can find more information on that tree species.
- Regularly conducting campus tree walks to educate the public and NCKUers on the importance and techniques of tree conservation. ☺



13 CLIMATE ACTION



RESEARCH

254 publications 10% of all Taiwan publications 2011-2020

Promoting Sustainable Aquaculture

Researchers at the International Centre for Scientific Development of Shrimp Aquaculture works on achieving a sustainable shrimp aquaculture industry. They have successfully developed and implemented control measures to minimize disease outbreaks; produced pathogen-resistant shrimp and systems that conserve energy and water. 🌱



14 LIFE BELOW WATER

Monitoring Aquatic Ecosystems

The university's coastal project team has developed technologies based on the Internet of Things (IoT) and drones to monitor the water quality of lakes, rivers, and coastal waters. It saves energy, resources and provides timely data to local water authorities.

The implementation plan adapted to environmental change in Tainan coastal area (IMPACT) enables students to reach out to local communities. The project aims to educate locals about climate change and the importance of conserving aquatic ecosystems. 🌱

Marine Biology and Cetacean Research Center

The experts at the center integrate knowledge from the rescue, conservation, education and research on the areas of marine biology, cetacean and ocean ecology. The faculty of this unit works closely with the coastal villagers, volunteers, and government agencies on the conservation of the marine environment. 🌱

EDUCATION

164 courses offered across 11 colleges in 2019-20 academic year.

OUTREACH

Example Courses:

- PE 7215 Disaster Management System
- OTMA 6201 System Dynamics for Ocean Information
- LS 7735 Cetacean Rescue & Rehabilitation
- HOE 6811 Restoration and Management of Coastal Wetland
- OTMA 6207 Introduction to Marine Affairs 🌱

ACTION

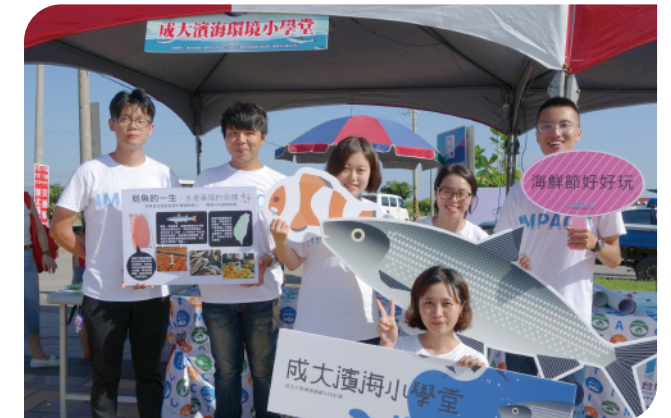
Rescuing Marine Mammals

Our cetacean rescue team has saved 60 dolphins and whales since 2000. The primary goal is always to release the stranded dolphin or whale after integral rescuing, medication, rehabilitation and recovery. 🌱

Reducing Plastic Waste

We use reusable bags or paper bags in all our campus activities. Shops on our campuses sell only recyclable PET plastic bottles. We are a plastic straw free campus. 🌱

The implementation plan adapted to environmental change in the Tainan coastal area (IMPACT) enables students to reach out to local communities. The project aims to educate locals about climate change and the importance of conserving aquatic ecosystems. 🌱



RESEARCH

150 publications **8%** of all Taiwan publications 2011-2020

Wetland Management

Taiwan's wetlands are an essential habitat for migratory birds and provide a range of ecosystem services with cultural, environmental and monetary value. Professor Hsiao-Wen Wang and her team are involved in the long term research in Budai Salt Pan and Chigu Salt Pan Wetlands located in Southwestern Taiwan. Their research has provided practical solutions to flood management in wetlands showing that they play a vital role in protecting neighbouring communities from flooding while at the same time preserving bird habitat. They are making local communities aware that they can live with wetlands instead of just next to wetlands through their work.

towards conserving urban biodiversity. NCKU has taken several steps, such as planting native species, establishing an online database, educating staff and students, and constructing ecological corridors to conserve biodiversity on campus. Currently, on-campus, there are 5,368 plants and trees of 134 species from 47 families.

sustainability lab, in collaboration with other researchers and locals, proposed a water management plan for the rehabilitation and conservation of the Chigu Salt Pan wetland in Taijiang National Park. The plan completed in 2020, and the work will begin in the dry season of 2021.

Ecological Education Park

Community involvement is the key to conservating biodiversity anywhere globally, so NCKU has established an Ecological Education Park in the heart of the city next to the student dormitories. Our staff and students developed the Park with support from local communities and finally opened in 2019 for all. NCKUers regularly conduct events to educate the public on the various aspects of biodiversity and conservation. The Park also serves as an open classroom for students to learn about tree ecology, planting, resource reuse, composting, and local biodiversity promotion.

Conservation of Habitat

Wetlands are one of the most biologically diverse systems of our natural environment. NCKU's water

OUTREACH

Coastal sandbanks are rich in species diversity and are a vital part of the nearby communities. NCKU is actively working with the local community to prevent sandbank erosion in the Beimen district. There is a lagoon behind the sandbanks where locals do oyster aquaculture, and erosion of sandbank due to improper city planning and climate change is threatening the existence of the lagoon. So the efforts by NCKU will not only preserve the biodiversity but also the livelihood of locals.



15 LIFE ON LAND

Orchid Research and Development Center

Orchids form 8% of all the flowering plants with 25,000 species, making them the largest family. They are susceptible to environmental changes and have considerable economic importance, thus a prominent focus of plant conservation worldwide. Our Orchid Research and Development Center working closely with international researchers, have sequenced the Apostasia shenzhenica genome and annotated 21,841 protein-coding genes to solve the hundred-year-old puzzle of the orchid's evolution. Through their work, the center is trying to cultivate new varieties adaptable to extreme climates to conserve them from rapid environmental changes.

EDUCATION

194 courses offered across 11 colleges in 2019-20 academic year.

ACTION

Conserving Biodiversity on Campus

University campuses are a unique place for urban biodiversity research, conservation, and education in our vast dense cities. Promoting biodiversity on campus also connects the public and push policymakers

RESEARCH

137 publications **8%** of all Taiwan publications 2011-2020

Smart Policing

Effective policing is crucial for social safety and people's happiness. It is well known that traffic crashes and violent crimes are the leading causes of death among the younger generation. Smart policing programs different from traditional approaches use evidence-based and data-driven strategies to efficiently curb crimes. Professor Pei-Fen Kuo and her team have studied the usability of the Data-Driven-Approach to Crime and Traffic Safety (DDACTS) model for Taiwan. Her team has found that using DDACTS may be effective for improving the patrol efficiency in Taiwan, thus acting as a deterrent to crashes and crimes by placing officers at the right place at the right time. ☞

Democracy and Health

Public health is an important indicator of solid institutions. Professor Yi-Ting Wang, with her international colleagues, have studied the relationship between democracy and population health. Her team analysed the dataset covering 173 countries from 1900 to 2012 to provide empirical evidence that democratic elections have consistent positive effects on health outcomes. ☞

Preventing Dating Violence

Dating violence (DV) is a global public health problem affecting young populations. Understanding the behavioural patterns might help prevent DV among university students. Professor Bih-Ching Shu and her colleagues utilized the Theory of Planned Behaviour (TPB) to assess the intention and other salient factors related to DV among university students in Taiwan. Her team found that promoting mutual acceptance, gender equality, emotional intelligence and communication skills may reduce DV among students. ☞

EDUCATION

393 courses offered across 11 colleges in 2019-20 academic year.

ACTION

Contribution to Pharmaceutical Policy Making

Our National Pharmaceutical Policy Research center has been involved in the country's drug policy development. The center is a think tank and a platform where government, the public, and industries discuss drug-related policies. Through its scientific research, the centre provides empirical data for the decision-makers to formulate and revise drug-related laws and policies. ☞

Student Associations

NCKU has many robust student associations led by students, representing their interests directly to higher university authorities. The representatives of these associations are independently elected by the students each academic year to ensure their rights are protected. ☞

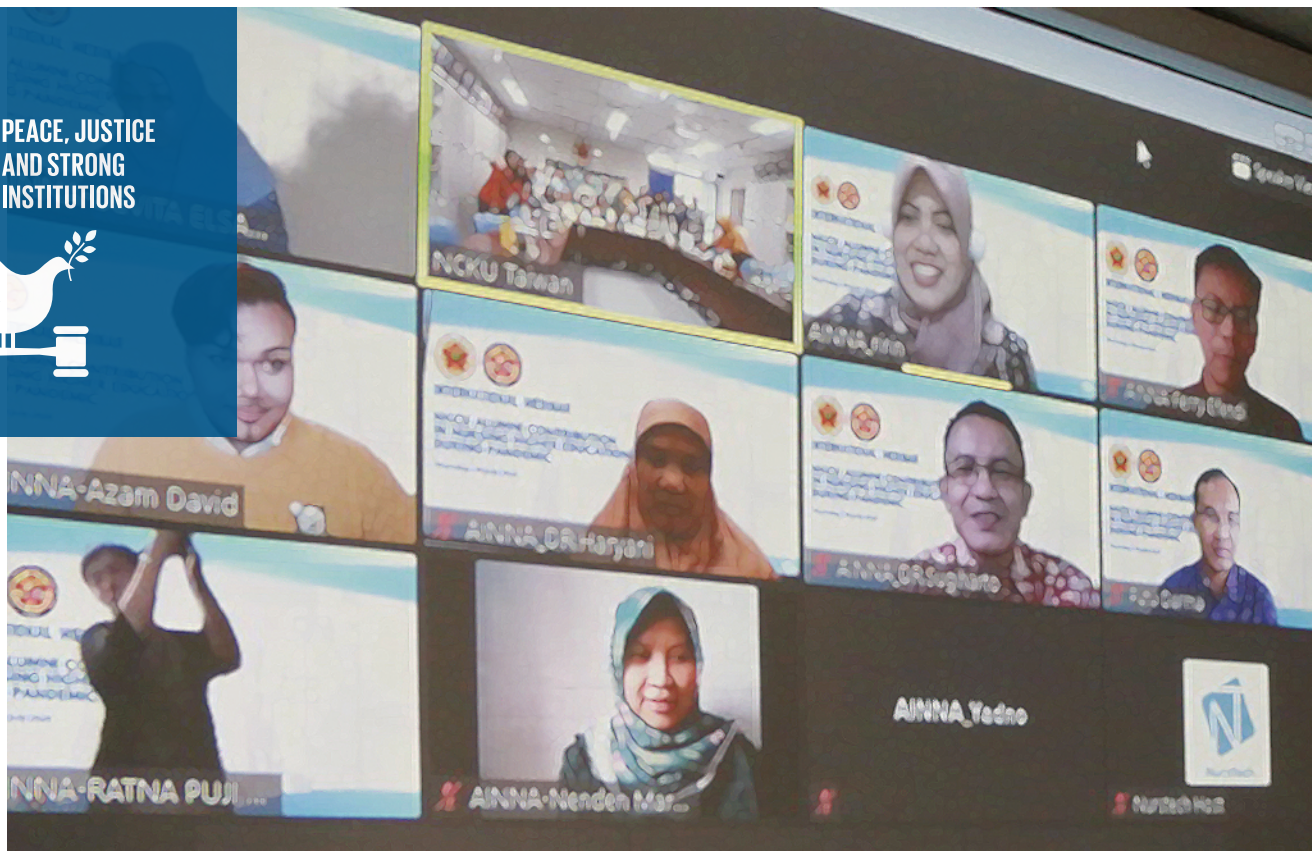
Anti-Corruption and Transparent Financial Policy

NCKU has a strict zero-tolerance policy for corruption at all levels of university operations. We publicly share all our financial information on our website to ensure transparency. ☞

OUTREACH

Everyone should have access to good legal services, and with this, in mind, our Department of Law has established a Legal Clinic to provide pro-bono legal services to the common public. The aid is limited to providing answers and suggestions to legal queries by the public. The clinic also regularly holds public meetings to make people aware of their legal rights. ☞

16 PEACE, JUSTICE AND STRONG INSTITUTIONS



RESEARCH

13892 publications **10%** of all Taiwan publications 2011-2020

Joint Water Quality Research with the Philippines

Algal blooms are a major concern hampering water quality worldwide. Monitoring harmful algae in drinking water requires resources and a skilled workforce absent in many countries. Philippines' water bodies are suffering from algal blooms and lacks the necessary research infrastructure to tackle them. So, in 2018 NCKU and Mapua University from the Philippines came together to establish a joint water quality research center with support from Taiwan's ministry of science and technology. This center provides necessary training and technology to locals in the Philippines to help them improve their water quality. 🌐

Meteorological Satellite System

Weather monitoring is crucial to predict and respond to natural disasters accurately. NCKU, in collaboration with the Taiwan government organisations, is working to establish a highly reliable meteorological satellite system for real-time monitoring and forecasting. 🌐

Land Policy development

Researchers at NCKU are working closely with the national and local governments to develop SDG-related policies. Based on their research findings, our professors have proposed technical amendments to the national development strategy for flood and drought disasters. NCKU continues to support the local and national government on various SDG related policies through its research. 🌐

EDUCATION

386 courses offered across 11 colleges in 2019-20 academic year.

Example Courses:

- IMBA 7201E International Financial Management
- MPH 7822 Aids and Public Health
- N8 62400 Field Studies in Sustainable Development
- HOE 6813 Maritime Safety
- OTMA 6504 International Law 🌐

ACTION

International Partnerships

NCKU is the founding member of the Presidents' Forum of Southeast Asia and Taiwan Universities (SATU Presidents' Forum). This forum provides opportunities for researchers from the Southeast Asian region to work together to make impactful contributions to the SDGs. Every year through SATU, we provide funding for the joint research projects between NCKU and other partner institutions. 🌐

Sustainability Collective

Sustainability Collective is a platform created by professors, researchers and students of NCKU who are passionate about sustainability and encourage social awareness about sustainable development. These enthusiastic individuals regularly organize open events such as live podcasts and invited lectures to share this passion. 🌐

First in Taiwan to incorporate SDGs into University Affairs

We were the first in the country to start incorporating SDGs into our academic, infrastructure and development plans. Also, first in the nation to sign the international SDG Accord. The Accord is a commitment from universities and colleges to implement the SDGs into their activities at all levels. The university has also set up an NCKU 2030 website to show our commitment and progress towards all 17 SDGs to the world. 🌐

International Summer School

Every year starting from 2013, we offer a special short course on SDGs. Professors from multiple departments specially design these courses to provide interdisciplinary learning to students. 🌐



OUTREACH

Through our University Social Responsibility (USR) 2026, we aim to bring the best sustainable practices to Taiwan's elderly population. Our students and staff are working with local communities in many districts of Tainan on various sustainable projects. 🌐

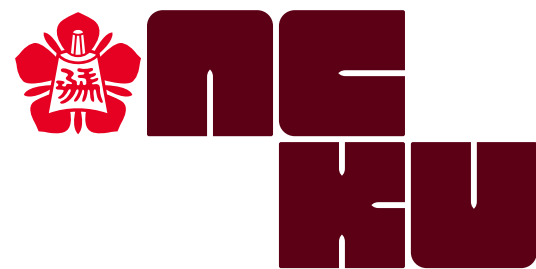
17 PARTNERSHIPS FOR THE GOALS



SATU Presidents' Forum
2020 General Assembly

SATU NCKU





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